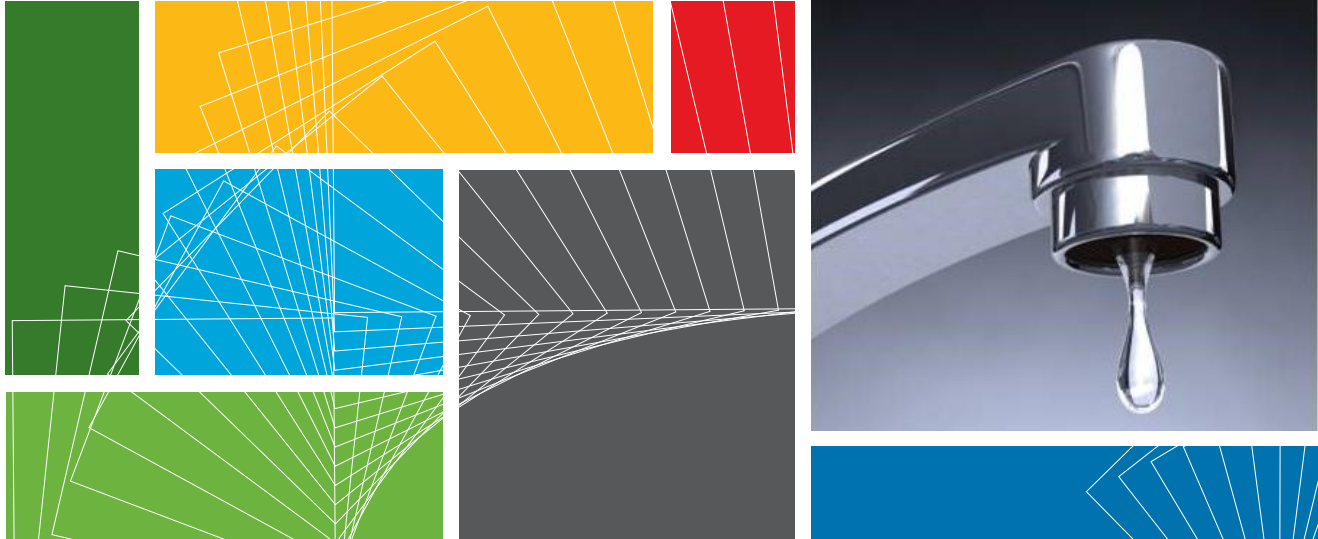




Inspiring sustainable thinking





ISL Engineering and Land Services Ltd. is an award-winning full-service consulting firm dedicated to working with all levels of government and the private sector to deliver planning and design solutions for transportation, water, and land projects.




Corporate Authorization

This document entitled “Water Master Plan” has been prepared by ISL Engineering and Land Services Ltd. (ISL) for the use of the City of Lloydminster. The information and data provided herein represent ISL’s professional judgment at the time of preparation. ISL denies any liability whatsoever to any other parties who may obtain this report and use it, or any of its contents, without prior written consent from ISL.



May 13, 2016

Angela Steward, M.Eng., P.Eng., LEED AP
Assistant Project Manager



May 13, 2016

Lily Dam, M.Eng., P.Eng.
Project Engineer

PERMIT TO PRACTICE
*ISL Engineering
and Land Services Ltd.*
Signature Barry Clark
Date May 13, 2016
PERMIT NUMBER: P 4741
The Association of Professional Engineers
and Geoscientists of Alberta

7909 – 51 Avenue Edmonton, AB T6E 5L9 T: 780.438.9000 F: 780.438.3700

May 13, 2016

Our Reference: 14228

City of Lloydminster

City Hall
4420 – 50 Avenue
Lloydminster, AB / SK T9V 0W2

Attention: Abdelqader Abdelqader, M.Sc., P.Eng.

Dear Sir:

Reference: Lloydminster Water Master Plan Final Report (Distribution System)

ISL Engineering and Land Services Ltd. (ISL) is pleased to submit the Lloydminster Water Distribution System Master Plan final report. Please note that this final report contains the distribution system assessment, while the water treatment plant assessment and WSA will be under a separate cover. This report:

- Identifies deficiencies in the existing system performance, such as high or low system pressures and inadequate fire flows, and provides upgrading recommendations to improve the level of service throughout the system; and
- Provides a plan for future distribution system expansion as development occurs, and identifies system upgrades (both existing and future) that are required to support future development.

This report is an important update to previous water master plans as it provides definitive sizing and pumping recommendations for the proposed dedicated fill line between the WTP and West End Reservoir. Furthermore, it incorporates a desktop distribution pipe condition assessment employing ranking criteria such as pipe age, material and break history, to provide the City with information for planning system rehabilitation programs.

Sincerely,



Richard Tombs, P.Eng., C.Eng., MIChemE
Project Manager



Executive Summary

The City of Lloydminster commissioned ISL Engineering and Land Services Ltd. (ISL) to update their Water Master Plan. This new Master Plan will provide a framework to City Council and administration to assess the status of existing infrastructure, both under current levels of development and additional future development in the area including the adjacent County lands. This study is necessary as it provides a framework for maintaining the water distribution system, as well as expanding the system in the future in response to City growth.

Major activities undertaken in this analysis include the following:

- Review and provide recommendations for updates to the City of Lloydminster water system design standards.
- Conduct a desktop distribution pipe condition assessment employing ranking criteria such as pipe age, material and break history, to provide the City with information with which they can plan system rehabilitation programs.
- Construct and calibrate a WaterCAD computer model of the existing water distribution system, and expand it to create 3 year, 5 year, 10 year and 20 year future system scenarios.
- Utilize the model as well as information on existing system issues to identify problem areas in the existing water distribution system.
- Identify upgrading required to the existing water distribution system to provide an acceptable level of service today and in the future, including costing.
- Size the proposed dedicated fill line which is to convey water from the Water Treatment Plant to the West End Reservoir, and propose pumping scenarios for filling the reservoir.
- Identify storage and pumping upgrading requirements at the West End Reservoir to service future development.
- Recommend a future water distribution system for future development areas.

Note that all system evaluation was performed on the basis of all water distribution occurring from the West End Reservoir, with the Water Treatment Plant distribution pumps supplying the City directly only under emergency conditions. In addition, a dedicated fill line between the Water Treatment Plant and the West End Reservoir is planned to be constructed in the near term.

The major findings of the existing and future system assessments are summarized below.

Existing System Assessment

- Updates should be made to the City of Lloydminster development standards as discussed in Section 4.6, including changes to water demands and fire flow requirements.
- A desktop distribution pipe condition assessment ranked the presumed condition of the pipes based on criteria such as age, material, and break history. The worst ranked pipes are generally located in the older downtown area where many breaks have occurred in the past. This condition assessment GIS data has been provided to the City so that they can maintain and update the database in the future.
- Existing system pressures are adequate provided that the West End Reservoir distribution pressure is raised to 375 kPa (703 m HGL) once all distribution switches to the West End Reservoir. A single pressure zone is adequate to service the existing development areas.
- Fire flow requirements are not met in several areas of the City, particularly where small diameter pipes service areas zoned for commercial or industrial development, which require higher fire flow requirements (up to 225 L/s). Operation of both the WTP and West End Reservoir pumps at the same time is required to provide maximum fire protection to the distribution system.
- The fire flow improvement pipe upgrades listed in Table ES 1 and shown on Figure ES 1 should be implemented. These upgrades are listed in order of priority to help the City plan upgrading programs. These upgrades are based on operation of both the WTP and West End Reservoir pumps at the same

time during fire flow conditions. Upgrading recommendations considered the condition assessment results presented in Section 3.

- The City should continue to investigate the “blockages” and possible closed valves in the system as discussed in Section 5.3, and once they have been resolved, additional fire flow testing should be performed to confirm and update the model calibration.

Future System Assessment

Dedicated Fill Line and WTP Pumphouse

- It is recommended that the City construct the dedicated fill line for the West End Reservoir in the near term, to move towards the planned operational strategy of supplying the system primarily from the West End Reservoir.
- The existing WTP pumps are capable of supplying the proposed dedicated fill line to the West End Reservoir up to about the 20 year growth horizon. Alternatively, new dedicated pumps could be installed at the WTP.
- A 750 mm dedicated fill line supplied by the existing WTP distribution pumps is recommended in the near term. The existing pumps can be operated for approximately 20 years or more, depending on future system demands. Pump upgrades would be required under ultimate (40 year+) demand conditions to supply the design flow rate of 726 L/s.
- The cost difference between a 750 mm and 900 mm dedicated fill line should be reviewed at the time of detailed design. This is to confirm the conclusions of the master plan analysis, which is sensitive to these costs.
- If adequate funding is available, it is recommended that the dedicated fill line extend directly from the WTP to provide more operational flexibility, as discussed in Section 6.3. However, connecting at 62 Street / 50 Avenue is also feasible at a lower cost (depending on chlorine contact times, see the discussion in Section 6.3.2).
- Regardless of the tie-in location of the dedicated fill line (62 Street or WTP), the dedicated fill line system must be configured such that the WTP pumphouse can continue to supply fire flow to the distribution system, as discussed in Section 6.3. This would include actuated valves that can control the flow from the WTP to either the dedicated fill line or the distribution system (in case of emergency/fire).

West End Reservoir

- Construction of 9850 m³ of additional storage at the West End Reservoir is required within the next 3 years based on Saskatchewan sizing guidelines. In the 10 year growth horizon, demolish the existing above ground reservoir and construct a new 11,000 m³ reservoir in its place. In the 20 year horizon, at least 13,000 m³ of additional storage will be required, the location of which is to be determined. The future system analysis is based on the 20 year storage upgrade being located at or near the current West End Reservoir.
- Pumping upgrades will be required at the West End Reservoir in three to five years, depending on demand increases, as well as in the 10 and 20 year growth horizons, as discussed in Section 6.5.1. The projected required pumping capacity at the West End Reservoir in the 20 year growth horizon is 929 L/s, which is more than double the current rated capacity of 412 L/s.

Future Distribution System

- The distribution system should continue to operate in a single pressure zone for the foreseeable future (up to the 20 year growth horizon), however if excess pressures are experienced in low-lying areas system or building pressure reducing valves may be considered.
- Existing system pipe upgrades to support future development are required, as listed in Table ES 2. These upgrades are in addition to those recommended to improve existing fire flows, and mostly consist of major pipe upgrades near the West End Reservoir to allow distribution of all future peak hour flows from that location. A few additional local fire flow pipe upgrades are also recommended.



- Future system fire flows are expected to be within requirements in most locations of the City provided the recommended existing system and future system upgrades are implemented in a timely fashion, and looping in new development areas is adequate including a network backbone of 250 mm, 300 mm and 400 mm pipes (Figures ES 2 to ES 5).
- The City should ensure adequate looping and extension of major watermain occurs in new developments as recommended in future servicing Figures ES 2 to ES 5. Water modeling by developers at the time of development will be required to confirm adequate fire flows and pressures are met.

Table ES 1: Proposed Existing Water Distribution System Upgrades

Priority No.	Address	Existing size/Material	Upgrade size/Material	Pipe Upgrade Length (m)	Total Cost (\$)	Comments
1	49 Ave from 50 St to 44 St	150 mm, CI	250 mm, PVC	593	\$1,720,000	Upgrade - to improve fire flow at several locations east of 49 Ave for highway commercial, institutional, multi-family and single family fire flows (see also Upgrade No. 11 for further improvements)
	49 Ave from 41 St to 40 St	150 mm, CI	250 mm, PVC	103		
2	50 Ave from 18 St to 12 St	150 - 200 mm, AC	250 mm, PVC	645	\$1,590,000	Local Upgrade - replace existing 150 - 200 mm AC pipe to improve fire flow in the area to the east of 50 Ave.
3	46 St, from 52 Ave along to 51 Ave	150 mm, CI	200 mm, PVC	175	\$4,950,000	Local Upgrade - this would replace a section of CI pipe and help improve fire flow here. Local Upgrade - this would replace a section of CI pipe and help improve fire flow here. Local Upgrade - this would replace a section of CI pipe and help improve fire flow here. Local Upgrade - this would replace a section of CI pipe and help improve fire flow at node J-1240 Local Upgrade - this would replace a section of CI pipe and help improve fire flow here. Local Upgrade - this would replace a section of CI pipe and help improve fire flow here.
	47 St, from 50 Ave to 53 Ave	150 mm, CI	200 mm, PVC	523		
	48 St, from 53 Ave to 52 Ave	150 mm, CI	200 mm, PVC	177		
	50 St, from 51 Ave to 55 Ave	150 mm, CI	200 mm, PVC	762		
	51 St, from 51 Ave along 51 St to 56 Ave	150 mm, CI	200 mm, PVC	670		
	50 Ave, from 56B St to 54 St	150 mm, CI	250 mm, PVC	619		
4	50 Ave west along 56 A St	150 mm, CI	200 mm, PVC	153	\$3,060,000	Upgrade - this would replace a section of CI pipe and help improve fire flow here. Upgrade - this would replace a section of CI pipe and help improve fire flow here. Upgrade - this would replace a section of CI pipe and help improve fire flow here. Upgrade - this would replace a section of CI pipe and help improve fire flow here.
	55 St, from 51 Ave to 52 Ave	150 mm, CI	300 mm, PVC	174		
	54A St, from 50 Ave to 51 Ave	150 mm, CI	200 mm, PVC	342		
	49 Ave, from 56B St to 54 St	150 mm, CI	250 mm, PVC	610		
5	54 St, from 49 Ave to 48 Ave	150 mm, AC	150 mm, PVC	16	\$1,530,000	Local Upgrade as part of the 49 Ave future upgrades - to meet Industrial, multi-family and single family fire flow Local Upgrade as part of the 49 Ave future upgrades - to meet Industrial, multi-family and single family fire flow
	50 Ave, from 60 St to 57 St	150 mm, AC	250 mm, PVC	591		
6	52 Ave, West on 57 St	150 mm, AC	250 mm, PVC	159	\$1,850,000	Local Upgrade - replace existing 150 mm AC line to improve fire flow here. Upgrade existing 150 mm AC to help improve fire flow for HWY commercial
	50 Ave, from 36 St to 29 St	150 mm, AC	250 mm, PVC	823		
7	Crosses 50 Ave at 29 St	N/A	250 mm, PVC	157	\$3,580,000	Upgrade - new 250 mm PVC to improve looping and increase fire flow for HWY commercial and local area to the east Upgrade - new 250 mm PVC to improve looping and increase fire flow for HWY commercial Upgrade - the existing 150 mm AC to help improve fire flow for HWY commercial. Upgrade - new 250 mm PVC to improve fire flow for the local area Local Upgrade - replace existing 150 mm AC pipe to improve fire flow to meet institutional & Single family fire flow Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial. Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial. Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial. Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial. Local Upgrade - replaced existing 200 mm AC pipe to improve fire flow for Industrial fire flow.
	Crosses 50 Ave at about 32 St	N/A	250 mm, PVC	45		
	From 36 St along 50 Ave east side to about 35 St	150 mm, AC	250 mm, PVC	124		
	31 St, from 50 Ave to 51 Ave	N/A	250 mm, PVC	124		
	52 Ave, from 35 St to 34 St	150 mm, AC	200 mm, PVC	204		
8	50 Ave, from 42 St to 40 St	150 mm, AC	250 mm, PVC	209	\$890,000	Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial. Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial.
	West on 41 St	150 mm, AC	200 mm, PVC	175		
9	41 St, from 59 Ave to 57 Ave	150 mm, AC	200 mm, PVC	331	\$1,490,000	Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial. Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial.
	43 St, from 56 Ave to 57 Ave	150 mm, AC	200 mm, PVC	364		
10	62 Ave west on 48 St	200 mm, AC	250 mm, PVC	215	\$530,000	Local Upgrade - replaced existing 200 mm AC pipe to improve fire flow for Industrial fire flow. Local Upgrade - this would replace a section of CI pipe and help improve fire flow here. Local Upgrade - this is a new pipe proposed here that runs north-south and improves looping. Local Upgrade - new 250 mm PVC pipe to go north south to meet the required FF Local Upgrade - this is a new pipe proposed here that runs north-south and improves looping.
	48 St, from 49 Ave to 47 Ave	150 mm, CI	200 mm, PVC	460		
11	48 Ave, from 49 St to 47 St	N/A	250 mm, PVC	196	\$5,330,000	Local Upgrade - existing pipe is 150 mm AC. Local Upgrade - existing pipe is 150 mm AC. Local Upgrade - existing pipe is 200 mm PVC, but would need to upsize to 300 mm PVC in order to meet required fire flow for industrial area. Local Upgrade - the existing 200 mm AC main to 250 mm PVC main helps improve flows along 52 St. Local Upgrade - propose to install new pipe here to provide looping to improve fire flow for industrial area here. Local Upgrade - new 250 mm PVC pipe to go north south to meet the required FF Local Upgrade - new 250 mm PVC pipe to go north south to meet the required FF
	45 St, from 49 Ave to 48 Ave	N/A	250 mm, PVC	93		
	46 Ave, from 50 St to 49 St	N/A	250 mm, PVC	101		
	45 Ave east along 49 St	150 mm, AC	200 mm, PVC	82		
	45 Ave east along 46 St	150 mm, AC	200 mm, PVC	94		
	45 Ave east along 45 St	200 mm, PVC	300 mm, PVC	576		
	52 St, from 45 Ave to about 43 Ave	200 mm, AC	250 mm, PVC	213		
	47 Ave, from 49 St to 47 St	N/A	250 mm, PVC	191		
	47 Ave, from 46 St to 45 St	N/A	250 mm, PVC	91		
	47 Ave, from 47 St to 46 St	N/A	250 mm, PVC	103		

Table ES 1: Proposed Existing Water Distribution System Upgrades

Priority No.	Address	Existing size/Material	Upgrade size/Material	Pipe Upgrade Length (m)	Total Cost (\$)	Comments
12	48 Ave, from 27 St to 26 St	150 mm, AC	250 mm, PVC	102	\$440,000	Local Upgrade - existing pipe is 150 mm AC and this helps meet the required fire flow in the area.
	27 St, south on 47A Ave	150 mm, AC	200 mm, PVC	88		Local Upgrade - existing pipe is 150 mm AC and this helps improve fire flow in the area.
13	57 Ave, from 51 St to 48 St	150 mm, PVC	200 mm, PVC	291	\$1,200,000	Local Upgrade this would replace a section of 150 mm PVC pipe and help meet the required fire flow here.
	57 Ave, west on 51 St	150 mm, PVC	250 mm, PVC	233		Local Upgrade - to meet the fire flow requirements for the institutional area
14	44 St, from 66 Ave to 62 Ave	150 mm, AC	250 mm, PVC	422	\$1,040,000	Local Upgrade - to meet Highway Commercial fire flow
15	32 St, from 49 Ave to 48 Ave	150 mm, AC	200 mm, PVC	98	\$210,000	Local upgrade to meet required FF
16	62 Ave along 56 St to 59 Ave	N/A	250 mm, PVC	296	\$2,000,000	Local Upgrade - propose to install new pipe here to provide looping to improve fire flow for industrial area here.
	59 Ave north to 62 St	N/A	250 mm, PVC	517		Local Upgrade - propose to install new pipe here to provide looping to improve fire flow for industrial area here.
17	West on 65 St and north on 52 Ave	200 mm, AC	250 mm, PVC	490	\$1,210,000	Local Upgrade - replace existing 200 mm AC pipe with 250 mm PVC to meet the required fire flow for industrial area.
18	62 St, south on 52 Ave	200 mm, AC	250 mm, PVC	232	\$870,000	Local upgrade to meet required FF
	53 Ave from 60 St to 59 St	250 mm, AC	300 mm, PVC	112		City can consider the local upgrade here in order to meet required FF at node J-51. This location is fairly close to the WTP and given the calibrated C value for AC pipe is 90, the model may be underestimating the flows here. City may want to consider doing local fire flow testing here.
19	29A St, north on the PUL between 58 Ave and 57B Ave	150 mm, AC	200 mm, PVC	96	\$210,000	Local Upgrade - new and replace existing 150 mm AC pipe to improve fire flow to meet SF residential flow.
20	46 Ave West on 35 St	150 mm, AC	200 mm, PVC	125	\$270,000	Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow to meet low density residential fire flow.
21	North of 36 St	N/A	300 mm, PVC	125	\$110,000	Upgrade - new 300 mm PVC line to residential area to meet the required fire flow for medium and single family residential.
22	30 St and 55A Ave	150 mm, AC	200 mm, PVC	210	\$780,000	Local upgrade to meet required FF
	30 St, south of 55 Ave	150 mm, AC	200 mm, PVC	152		Local upgrade to meet required FF
23	46A Ave, along 23 St	150 mm, AC	200 mm, PVC	84	\$180,000	Local upgrade to meet required FF
24	35 St, south on 45A Ave	150 mm, AC	200 mm, PVC	89	\$190,000	Local upgrade to meet required FF
25	50 Ave south to 44 St	N/A	250 mm, PVC	32	\$80,000	Local upgrade to provide looping to improve the level of service here

Notes:

1. AC = Asbestos Cement
CI = Cast Iron
FF = Fire flow
HWY = Highway
WTP = Water Treatment Plant
2. Upgrades are grouped by location.
4. Cost Estimates are conceptual.
5. Costs are in 2015 dollars and are based on historical costs as provided by the City of Lloydminster.
7. The total cost is the cost for the entire upgrade group.

Table ES 2: Future Water System Upgrades (Near Term to 20 Year Horizon)

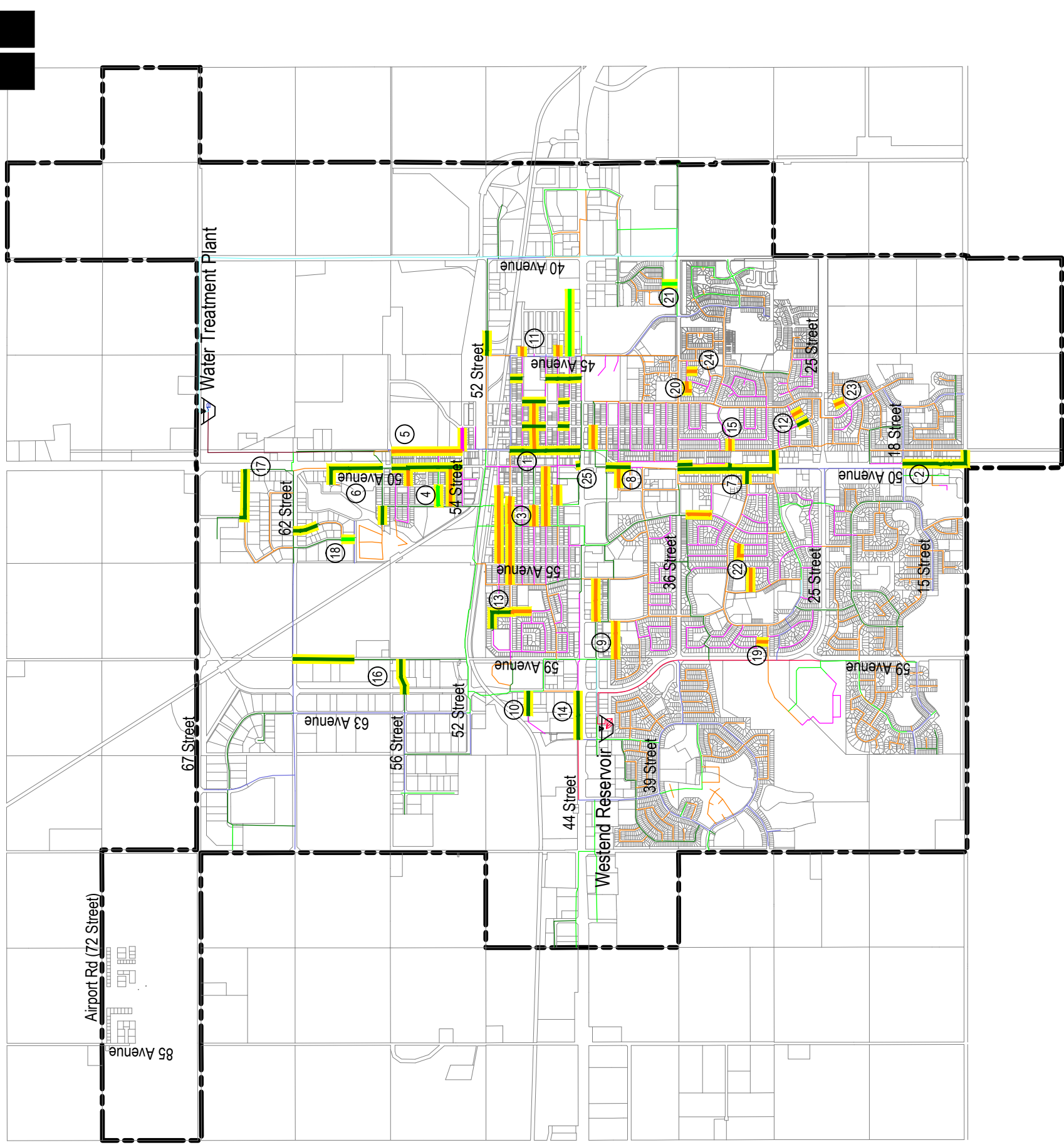
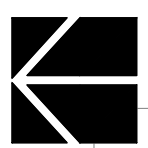
Upgrade Type	Address	Upgrade size/Material	Pipe Upgrade Length (m)	Total Cost (\$)	Comments
NEAR FUTURE					
Dedicated Fill Line	From 62 Street/50 Avenue to the West End Reservoir	750 mm, PVC	6310	\$15,640,000	750 mm dedicated fill line, using existing WTP pumps
FUTURE 3 Year					
West End Reservoir Expansion	West End Reservoir	9850 m ³		\$4,925,000	Expand WR
West End Reservoir Pumping Upgrade	West End Reservoir	70 L/s		\$200,000	Add additional pumping capacity at WR for Peak Hour
Network Upgrade	44 St, from 70 Ave to 75 Ave and from 75 Ave at 44 St to 52 St	500 mm, PVC	1360	\$1,774,800	Extend the 500 mm main on 44 St, in order to meet minimum system pressures during peak hour demand in the northwest industrial area.
Fire Flow Upgrade	48 Ave, from 54 St to 53 St	200 mm, PVC	111	\$238,220	New 200 mm pipe, running north-south is proposed in order to meet the required FF. Increases fire flow from 75 L/s to 146 L/s (100 L/s is required).
FUTURE 5 Year					
West End Reservoir Pumping Upgrade	West End Reservoir	75 L/s		\$200,000	Add additional pumping capacity at WR for Peak Hour
FUTURE 10 Year					
Network Upgrade	At the WR discharge	750 mm, PVC	160	\$698,320	Upgrade the 500 mm main leading out of the WR with 750 mm (or equivalent pipe twinning)
Network Upgrade	43 St, from about 62 Ave to 66 Ave	750 mm, PVC	207	\$903,470	Upgrading in the vicinity of the WR is required to minimize headloss and ensure minimum system pressures are met during peak hour demand.
West End Reservoir Expansion	West End Reservoir	11000 m ³		\$8,250,000	Includes demolition of the existing above ground reservoir and building new expansion on its site
West End Reservoir Pumping Upgrade	West End Reservoir	132 L/s		\$500,000	Add additional pumping capacity at WR for Peak Hour

Table ES 2: Future Water System Upgrades (Near Term to 20 Year Horizon)

Upgrade Type		Address	Upgrade size/Material	Pipe Upgrade Length (m)	Total Cost (\$)	Comments
FUTURE 20 Year						
West End Reservoir Expansion		West End Reservoir	13000 m ³		\$13,000,000	Expand WR - New Reservoir location to be determined. Modeling based upon expansion at or near existing reservoir.
West End Reservoir Pumping Upgrade		West End Reservoir	240 L/s		\$500,000	Add additional pumping capacity at WR for Peak Hour
J-78	J-77	73 Ave, from 43 St to 44 St	600 mm, PVC	162	\$641,280	Twin the existing 400 mm PVC with 600 mm PVC to minimize headloss and ensure minimum system pressures are met during peak hour demand.
J-77	J-1196	44 St, from 66 Ave to 70 Ave	500 mm, PVC	520	\$1,869,920	Twin the existing 500 mm PVC with 500 mm PVC to minimize headloss and ensure minimum system pressures are met during peak hour demand.
J-290	J-2322	48 Ave, from 42 St to 41 St	200 mm, PVC	99	\$212,460	New 200 mm pipe, running north-south is proposed in order to meet the required FF. Increases fire flow from 224 L/s to 289 L/s (225 L/s is required).

Notes:

1. FF = Fire flow
WR = West End Reservoir
2. Pipe length is based on the model scaled length.
3. Cost estimates are conceptual and are in 2015 dollars. Where possible, rates are based on historical costs provided by the City of Lloydminster.



Legend

City Boundary

EXISTING PIPE SIZES

- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other

PROPOSED PIPE SIZES

- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other

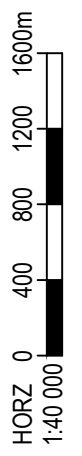
Reservoir / WTP

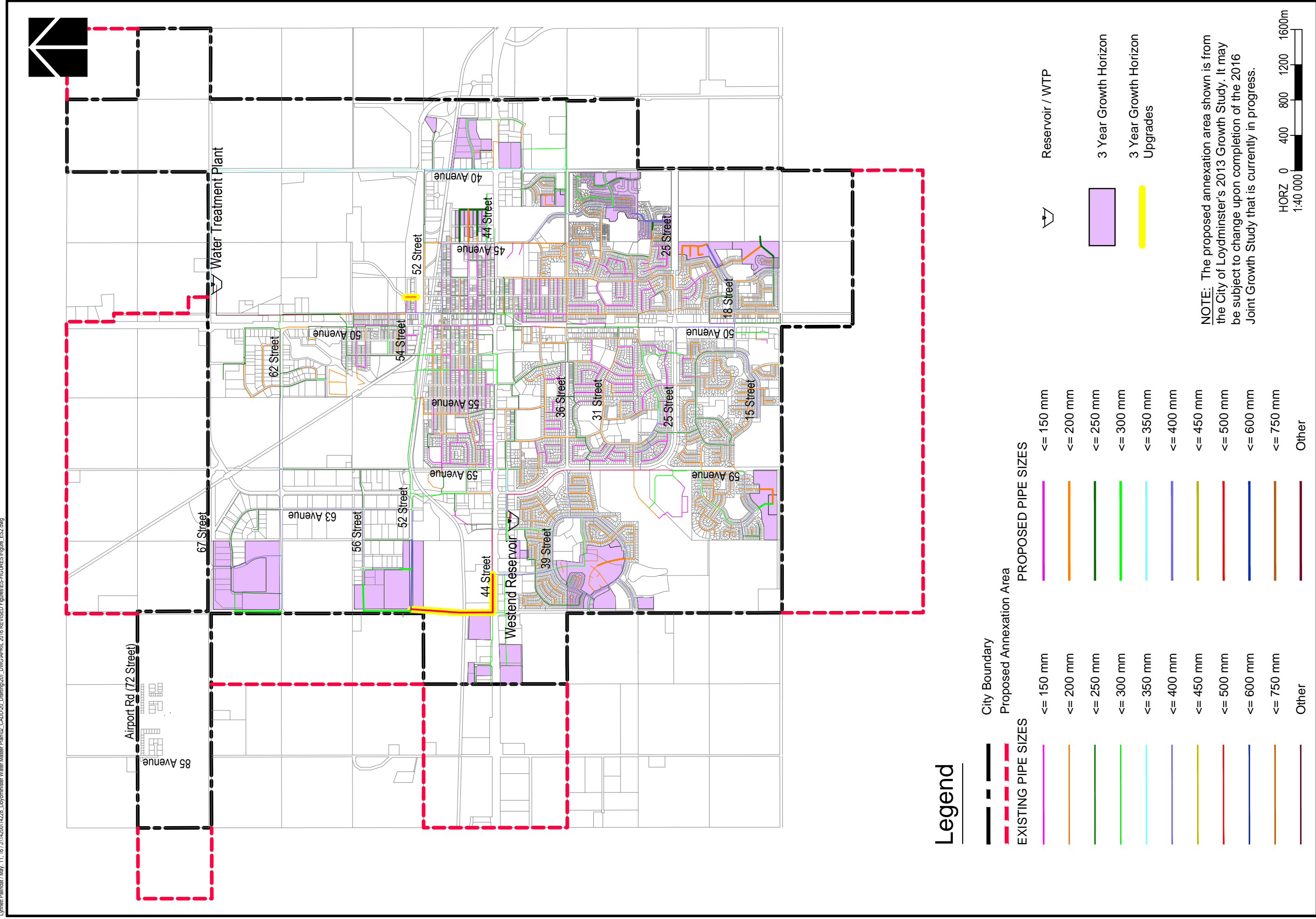


Proposed Upgrade Locations



Existing System Upgrades

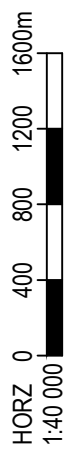


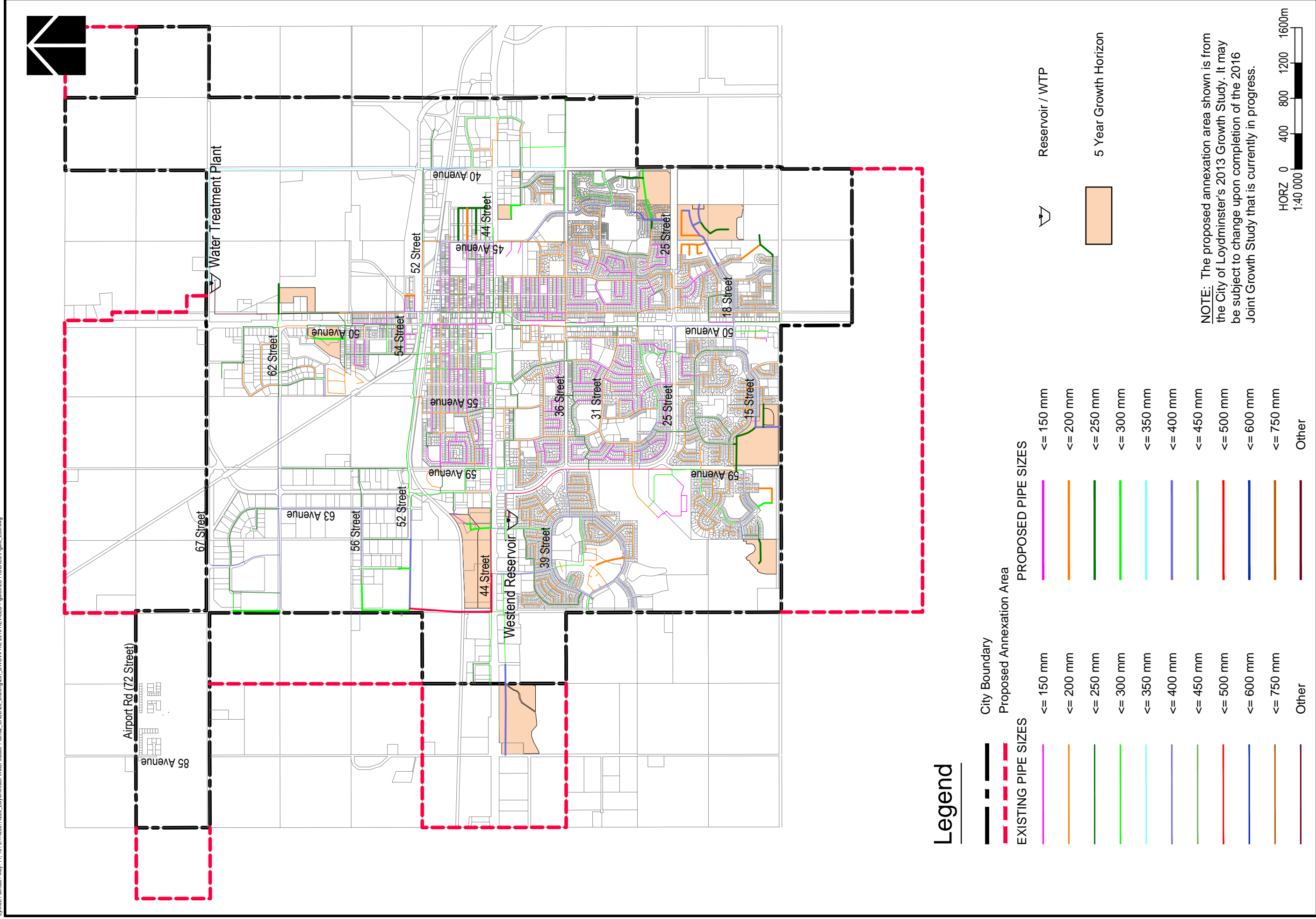


Legend

- City Boundary
 - Proposed Annexation Area
- | EXISTING PIPE SIZES | | PROPOSED PIPE SIZES | |
|---------------------|-----------|---------------------|-----------|
| | <= 150 mm | | <= 150 mm |
| | <= 200 mm | | <= 200 mm |
| | <= 250 mm | | <= 250 mm |
| | <= 300 mm | | <= 300 mm |
| | <= 350 mm | | <= 350 mm |
| | <= 400 mm | | <= 400 mm |
| | <= 450 mm | | <= 450 mm |
| | <= 500 mm | | <= 500 mm |
| | <= 600 mm | | <= 600 mm |
| | <= 750 mm | | <= 750 mm |
| | Other | | Other |
- 3 Year Growth Horizon
 - 3 Year Growth Horizon Upgrades
 - Reservoir / WTP

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.

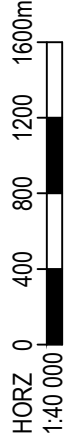


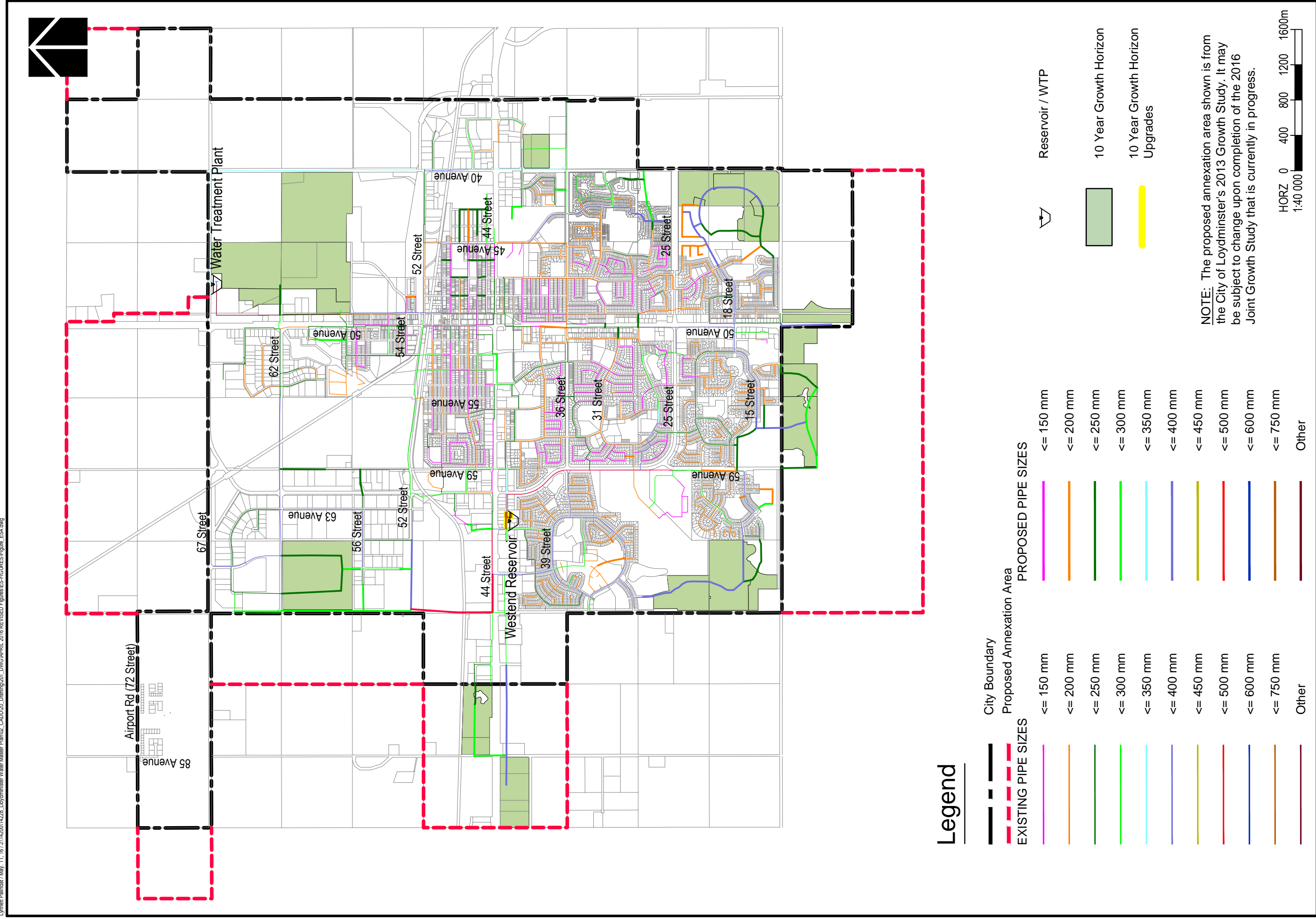


Legend

- City Boundary
 - Proposed Annexation Area
- | EXISTING PIPE SIZES | PROPOSED PIPE SIZES |
|---------------------|---------------------|
| <= 150 mm | <= 150 mm |
| <= 200 mm | <= 200 mm |
| <= 250 mm | <= 250 mm |
| <= 300 mm | <= 300 mm |
| <= 350 mm | <= 350 mm |
| <= 400 mm | <= 400 mm |
| <= 450 mm | <= 450 mm |
| <= 500 mm | <= 500 mm |
| <= 600 mm | <= 600 mm |
| <= 750 mm | <= 750 mm |
| Other | Other |
- Reservoir / WTP
 - 5 Year Growth Horizon

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.





Legend

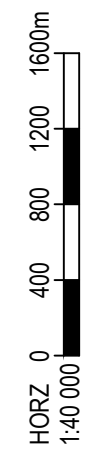
EXISTING PIPE SIZES		PROPOSED PIPE SIZES	
	City Boundary		<= 150 mm
	Proposed Annexation Area		<= 200 mm
			<= 250 mm
			<= 300 mm
			<= 350 mm
			<= 400 mm
			<= 450 mm
			<= 500 mm
			<= 600 mm
			<= 750 mm
	Other		Other

Reservoir / WTP

10 Year Growth Horizon

10 Year Growth Horizon Upgrades

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.



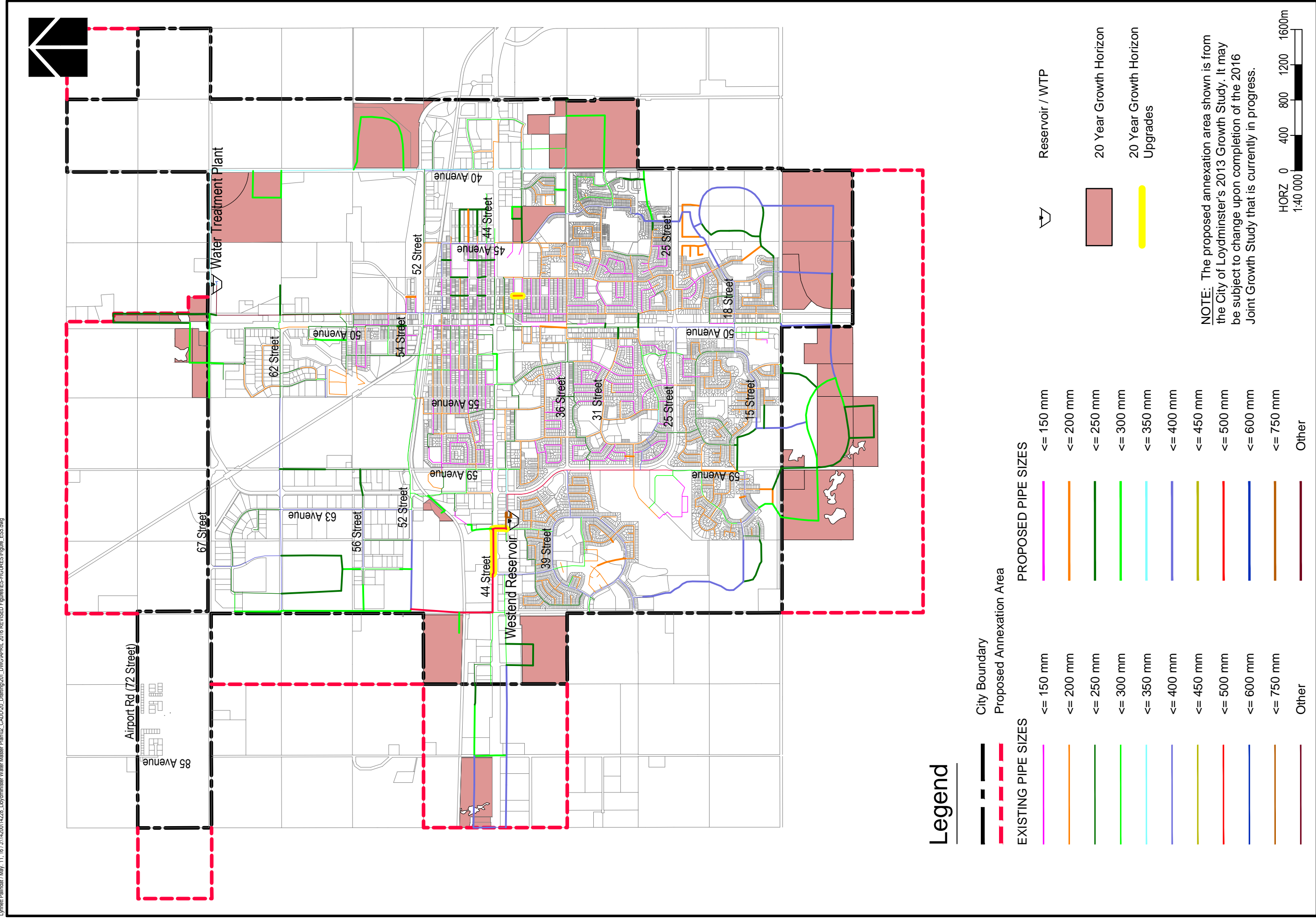




Table of Contents

1.0	Introduction	1
1.1	Authorization	1
1.2	Context	1
1.3	Purpose of Study	1
2.0	Background Information	3
2.1	Lloydminster Water System	3
2.2	Data Collection and Analysis	4
3.0	Pipe Condition Assessment.....	7
4.0	Design Parameters	11
4.1	Existing Population	11
4.2	Existing Land Use	11
4.3	Population Density	11
4.4	Future Growth Projections	12
4.5	Existing Water Consumption	12
4.6	Distribution System Design Criteria	13
4.7	Future Water Demands	16
5.0	Existing System Assessment	17
5.1	Existing System WaterCAD Model	17
5.2	Water Demands	18
5.3	Calibration and Validation of the WaterCAD Model	18
5.4	Lloydminster Water Distribution System Operating Philosophy	22
5.5	Hydraulic Analysis of the Existing System	22
5.6	Existing System Upgrading Recommendations	25
5.7	Existing System Upgrading Probable Costs	26
6.0	Future System Assessment.....	27
6.1	Future Water Model and Demands	27
6.2	Treated Water Reservoir Storage Analysis	28
6.3	West End Reservoir Fill Line Analysis	30
6.4	Pressure Zone Analysis	37
6.5	Future Distribution System	37
6.6	Future System Upgrading Probable Costs	42
7.0	Conclusions and Recommendations	45
7.1	Conclusions	45
7.2	Recommendations	45

APPENDICES

Appendix A	Water Demand Calculations
Appendix B	Fire Flow Testing Reports (SFE Global)
Appendix C	Existing System Model Fire Flow Results
Appendix D	Condition Assessment Data



TABLES

Table 3.1:	Condition Assessment Ranking Criteria.....	9
Table 4.1:	Summary of the City of Lloydminster Population	11
Table 4.2:	Population and Land Use Areas for Various Growth Horizons.....	following page 12
Table 4.3:	Historical Water Consumption – 2008 to 2014.....	12
Table 4.4:	Historical Per Capita Water Consumption (Including Non-Residential Use) – 2008 to 2014 ..	13
Table 4.5:	Water Distribution System Standards Comparison	following page 14
Table 4.6:	Recommended Lloydminster Water System Design Standards.....	15
Table 4.7:	Summary of Total Cumulative Demands at Each Growth Horizon.....	following page 16
Table 5.1:	Pump Specifications	17
Table 5.2:	Hydrant Flow Test Field Data (on a separate page)	following page 18
Table 5.3:	Calibrated Model Comparison with Hydrant Flow Test Results	following page 20
Table 5.4:	Summary of Model Calibration Pressure Error Results.....	19
Table 5.5:	Additional Hydrant Flow Test Field Data.....	following page 22
Table 5.6:	Validated Model Comparison with Hydrant Flow Test Results.....	following page 22
Table 5.7:	Summary of Model Validation Pressure Error Results	21
Table 5.8:	Model Pump Setting Summary	23
Table 5.9:	Proposed Existing Water Distribution System Upgrades to Meet Fire Flow Requirements.....	following page 26
Table 5.10:	Existing System Hydraulic Upgrade Prioritization Matrix	25
Table 5.11:	Existing System Upgrades – Cost Estimates	following page 26
Table 6.1:	Future Water Demands for Distribution System Modeling (MDD = 2 x ADD)	27
Table 6.2:	Future Water Demands for Water Treatment Plant and Fill Line Analysis (MDD = 1.5 x ADD)	28
Table 6.3:	Lloydminster Treated Water Storage Capacity	28
Table 6.4:	Projected Potable Water Storage Requirements	29
Table 6.5:	Summary of West End Reservoir Expansion Needs.....	30
Table 6.6:	Calculated Filling Rates Based on Design Max Day Demand.....	31
Table 6.7:	Calculated Filling Rates Based on “Extrapolated Current” Max Day Demands.....	31
Table 6.8:	Proposed Future Fill Line Filling Rates	32
Table 6.9:	Factors Determining Fill Line Starting Point.....	33
Table 6.10:	Dedicated Fill Line Pumping Using Existing WTP Distribution Pumps.....	following page 34



Table 6.11:	Dedicated Fill Line Pumping Using New Dedicated Pumps	following page 36
Table 6.12:	Comparison of Pumping Heads for 750 mm and 900 mm Fill Lines (PSV @ 20 kPa).....	35
Table 6.13:	Cost Summary for 750 mm and 900 mm Dedicated Fill Lines with Existing WTP Pumps or New Dedicated Pumps	following page 36
Table 6.14:	Net Present Value Summary of Fill Line and Pumping Estimates.....	36
Table 6.15:	West End Reservoir Future Pumping Capacity Requirements.....	38
Table 6.16:	Comparison of MDD plus Fire Flow demands to Peak Hour Demands	39
Table 6.17:	Future Water System Upgrading Probable Costs (Near Term to 20 Year Horizon)	following page 42

FIGURES

Figure 1.1:	Topography.....	following page 2
Figure 2.1:	Existing Water Distribution System.....	following page 6
Figure 3.1:	Length of Distribution System Pipe Construction by Year from City’s GIS (Dated February 13, 2015)	7
Figure 3.2:	Breakdown of Distribution System Pipe Materials from City’s GIS (Dated February 13, 2015).	8
Figure 3.3:	Breakdown of Distribution System Pipe Sizes from City’s GIS (Dated February 13, 2015)	8
Figure 3.4:	Watermain Pipe Condition Ranking	following page 10
Figure 4.1:	Population and Water Consumption Graphs.....	following page 16
Figure 4.2:	Existing Land Use	following page 16
Figure 4.3:	Lloydminster Future Growth Staging.....	following page 16
Figure 5.1:	Hydrant Flow Test Locations.....	following page 26
Figure 5.2:	Existing Water Distribution System Operation	following page 26
Figure 5.3:	Average Day Demand Analysis	following page 26
Figure 5.4:	Maximum Day Demand Analysis	following page 26
Figure 5.5:	Peak Hour Demand Analysis	following page 26
Figure 5.6:	Peak Hour Demand Existing Pipe Velocity	following page 26
Figure 5.7:	Distribution from WR Only Fire Flow Contours	following page 26
Figure 5.8:	Distribution from WR Only Locations Meeting Fire Flow Requirements.....	following page 26
Figure 5.9:	Distribution from WR and WTP Fire Flow Contours.....	following page 26
Figure 5.10:	Distribution from WR and WTP Locations Meeting Fire Flow Requirements ..	following page 26



Figure 5.11: Location of Proposed Existing System Upgrades following page 26

Figure 5.12: Existing System Upgrades Fire Flow Contours..... following page 26

Figure 5.13: Existing System Upgrades Locations Meeting Fire Flow Requirements following page 26

Figure 6.1: Future Growth Areas..... following page 44

Figure 6.2: Future Land Use following page 44

Figure 6.3: Filling Rates Based On Future Maximum Day Demand Estimates following page 44

Figure 6.4: Dedicated Fill Line System Curves following page 44

Figure 6.5: Dedicated Fill Line Connection Schematics following page 44

Figure 6.6: System Curves for 750mm Dedicated Fill Line with Existing Pumping from WTP following page 44

Figure 6.7: System Curves for 900mm Dedicated Fill Line with Existing Pumping from WTP following page 44

Figure 6.8: System Curves For 750 mm Dedicated Fill Line With New Dedicated Pumping From WTP..... following page 44

Figure 6.9: System Curves For 900 mm Dedicated Fill Line With New Dedicated Pumping From WTP..... following page 44

Figure 6.10: Proposed Water Distribution System Operation..... following page 44

Figure 6.11: 3 Year Growth Horizon Water Distribution System following page 44

Figure 6.11A: 3 Year Growth Horizon Average Day Demand Analysis following page 44

Figure 6.11B: 3 Year Growth Horizon Peak Hour Demand Analysis following page 44

Figure 6.11C: 3 Year Growth Horizon Fire Flow Contours following page 44

Figure 6.11D: 3 Year Growth Horizon Locations Meeting Fire Flow Requirements following page 44

Figure 6.12: 5 Year Growth Horizon Water Distribution System following page 44

Figure 6.12A: 5 Year Growth Horizon Average Day Demand Analysis following page 44

Figure 6.12B: 5 Year Growth Horizon Peak Hour Demand Analysis following page 44

Figure 6.12C: 5 Year Growth Horizon Fire Flow Contours following page 44

Figure 6.12D: 5 Year Growth Horizon Locations Meeting Fire Flow Requirements following page 44

Figure 6.13: 10 Year Growth Horizon Water Distribution System following page 44

Figure 6.13A: 10 Year Growth Horizon Average Day Demand Analysis following page 44

Figure 6.13B: 10 Year Growth Horizon Peak Hour Demand Analysis following page 44

Figure 6.13C: 10 Year Growth Horizon Fire Flow Contours following page 44

Figure 6.13D: 10 Year Growth Horizon Locations Meeting Fire Flow Requirements following page 44

Figure 6.14: 20 Year Growth Horizon Water Distribution System following page 44



Figure 6.14A: 20 Year Growth Horizon Average Day Demand Analysis following page 44

Figure 6.14B: 20 Year Growth Horizon Peak Hour Demand Analysis following page 44

Figure 6.14C: 20 Year Growth Horizon Peak Demand Pipe Velocity following page 44

Figure 6.14D: 20 Year Growth Horizon Fire Flow Contours following page 44

Figure 6.14E: 20 Year Growth Horizon Locations Meeting Fire Flow Requirements following page 44



1.0 Introduction

1.1 Authorization

ISL Engineering and Land Services Ltd. (ISL) was commissioned by the City of Lloydminster to update their Water Master Plan. The last update to the Master Plan was in 2009 (City of Lloydminster Water Distribution Study 2009 Update by Associated Engineering) and since then City's population has grown by approximately 16%. The current project has been initiated as a result of the combination of rapid growth within the City and the shift to a new operating philosophy of distributing potable water primarily from the West End Reservoir.

This new Master Plan will provide direction to City Council and Administration to assess the status of existing infrastructure, both under current development and considering future development within the City. In addition, it provides a framework for expanding the system in the future in response to City growth.

1.2 Context

The City of Lloydminster presently has a population of approximately 31,483 people, according to the 2013 Municipal Census. It is located about 250 km east of Edmonton and is Canada's only border city, with the provincial border running through its center. Saskatchewan provincial laws and regulations apply to water servicing in Lloydminster according to The Lloydminster Charter.

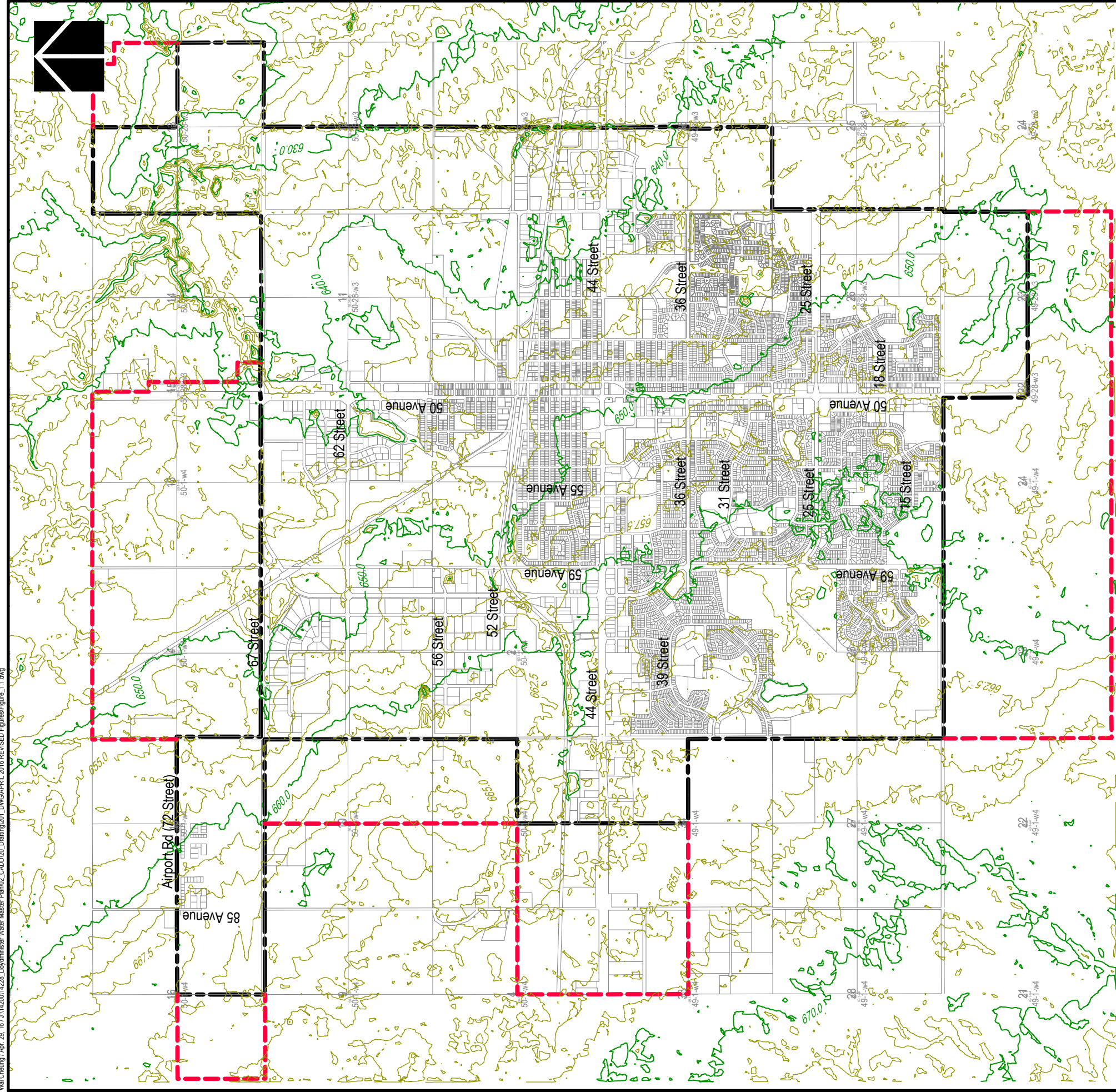
The City is generally flat to gently rolling, with a gentle slope downward from the southwest towards the northeast. Ground elevations within the existing distribution system range from about 635 m in northeast to about 664 m in southwest. The topography of the area is illustrated on Figure 1.1.

1.3 Purpose of Study

There are six reasons for developing this Water Master Plan:

1. To inventory and analyze the existing water distribution network under a variety of demand conditions to check for areas either lacking sufficient pressure for water distribution or having problematically high system pressures.
2. To check available fire flow within all areas of the City to ensure that the required fire flow standards for each type of development are met.
3. To determine what, if any, upgrades are needed to the existing water distribution system to meet present City needs, as well as upgrades or new water distribution network construction to facilitate future growth within the City.
4. To develop plans for future growth. Location and timing of development can be coordinated with the availability of adequate infrastructure.
5. To comment on possible staging of upgrades to assist in municipal capital planning.
6. To assess the design requirements for a dedicated fill line proposed to be constructed between the water treatment plant (WTP) and West End Reservoir (WR).

Wia Cheung / Apr. 29, 16 / J:\142001\4228_Lloydminster Water Master Plan\02_CADD\20_Drawing\201_DWG\APRIL 2016 REVISED Figures\Figure_1_1.dwg



Legend

-  City Boundary
-  Proposed Annexation Area

NOTE: Contour Interval = 2.5m

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.





2.0 Background Information

2.1 Lloydminster Water System

2.1.1 Water Supply

The water supply for the Lloydminster water distribution system is the North Saskatchewan River. The raw water supply infrastructure was commissioned in 1983 and expanded in 1991 and 1999. It supplies water to the Lloydminster water treatment plant, Husky Energy Upgrader, and some smaller commercial, agricultural and recreational users. The facilities includes the river intake structure, pumphouse which delivers water to the settling pond via low lift pumps, and a raw water reservoir, which receives water via a raw water supply line by high lift pumps. The current raw water withdrawal license (based on gross diversion) is 9,000 acre-feet or approximately 30,500 m³/day (30.5 ML/day), based on the AEP Interim License no. 00031759-00-00. The current average daily demand is approximately 11,000 m³.

2.1.2 Water Treatment Plant No. 2 (WTP)

The existing WTP is located at 67 Street and about 500 m east of 50 Avenue in the Province of Saskatchewan. It has been in operation since 1984. The WTP is currently operated from 6:00 am to 11:00 pm, except during peak days when it may operate 24 hours a day. It has an average flow of 10,500 m³/d and a net production capacity of 21,800 m³/d.

2.1.3 Reservoirs

The West End Reservoir is located just south of 43 Street and east of 63 Avenue. The reservoir has approximately 24,800 m³ of total storage in the above ground concrete tank (constructed in 1974) and the two underground cells (constructed in 2006). In 2006, a new pumphouse with four electric motor pumps were installed. The WR is currently filled from the WTP via the distribution system, during off peak water demands. Note that the system is currently designed to either fill or pump out, but not at the same time. The fill valve will either open or close during the filling operation in order to maintain a set fill pressure of 295 kPa. If this cannot be maintained, the fill valve will close.

2.1.4 Distribution Pump Houses

Although the City is serviced by a single pressure zone (Main Zone), there are currently two pump houses operating in the system:

- the WTP pumphouse (WTP), and
- the West End Reservoir pumphouse (WR).

The pumphouse at the WTP contains three pumps. PWP 101 and PWP 102 are identical fixed speed pumps (189 L/s or 680 m³/hr at 61 m head), while PWP 103 is variable speed (189 L/s or 680 m³/hr at 59 m head, with variable frequency drive (VFD)). Current typical operations have one fixed speed pump operating along with the VFD pump. The constant speed pumps (PW 101 and 102) are alternated daily. At present, the WTP typically operates from 6 am to 11 pm, and consequently this pumphouse only operates when the WTP is producing water as there is minimal storage on site. All pumping controls are manually operated (start/stop) through a SCADA system from the WTP control room: The VFD pump is manually controlled depending on West End Reservoir filling requirements. If system pressures drop and the operator is not manually increasing the VFD settings, the West End Reservoir pumphouse is programmed to automatically start up based on its set points. It is currently not possible to run the two fixed speed pumps at the same time as under current demands, pressures would increase to over 700 kPa, and a pressure reducing valve is set to relieve at that set point.

The pumphouse at the WR has four electric motor pumps, with each pump rated at 103 L/s (372 m³/hr) at 43 m head. Two of the pumps (VSP1 and VSP2) are Variable Frequency Drive (VFD) and are currently set to discharge at 305 kPa (31.1 m). Pumps DP3 and DP4 are constant speed pumps. The system is designed to operate as follows:

- VSP1 starts up on low pressure at 260 kPa and will shut down when the flow from the WR reaches 220 m³/hr.
- VSP2 has a 15 second delay and starts up on low pressure at 220 kPa. VSP2 will shut down when the flow from the WR reaches 365 m³/hr.
- DP3 will start at 260 kPa with a 30 second delay, however once VSP1 or VSP2 reaches 54 Hz, DP3 will stop after 30 seconds.
- There is also a pressure reducing valve set at 400 kPa to protect the system by controlling the maximum discharge pressure to the system.

The City has identified that they would like move to using the West End Reservoir for all daily potable water distribution, and use the WTP pumphouse only for filling the WR via a dedicated fill line and/or for emergencies.

2.1.5 Distribution System Pipe Network

The City of Lloydminster's existing water distribution system is shown on Figure 2.1.

The distribution pipe network (excluding services and raw water transmission) includes over 170 km of pipe varying in size from 150 mm to 750 mm in diameter. The pipe network consists of four different types of pipe material, including asbestos cement (AC), cast iron (CI), PVC, and steel. The majority of the piping is PVC (66%), concentrated in the newer areas, with older areas consisting of asbestos cement (26%) and cast iron (5%) piping. Steel piping (2%) is located at the pump houses and reservoirs.

2.2 Data Collection and Analysis

The City of Lloydminster provided a substantial amount of data, CAD/GIS bases, and operational information to assist with preparation of the Master Plan. The data collected includes:

- GIS or CAD base drawings such as: legal base, water system, air photos, contours plans or digital elevation models, land use maps (existing and future)
- 2009 WaterCAD water model
- Population data (current and historical)
- Water system information such as: GIS database, record drawings, water consumption records, water billing records, pumping information (e.g. pump curves, pump operation strategy and controls), reservoir capacities, leakage rates / water losses
- Condition assessment data needs such as: watermain break records, maintenance records (e.g. replacement of leaky valves, etc.), pipe installation dates, pipe materials, pipe diameters (from GIS), soil/geotechnical reports and groundwater table information
- Water Treatment Plant / Pumping Analysis data needs such as: raw, partially treated and final water laboratory analysis, daily operations data from WTP, off-site reservoir historical levels and distribution flows, pump name plate data / performance curves, operational philosophy / narrative / SOPs, treatment performance assessments, records of major events / issues, records of customer complaints, record drawings and previous reports



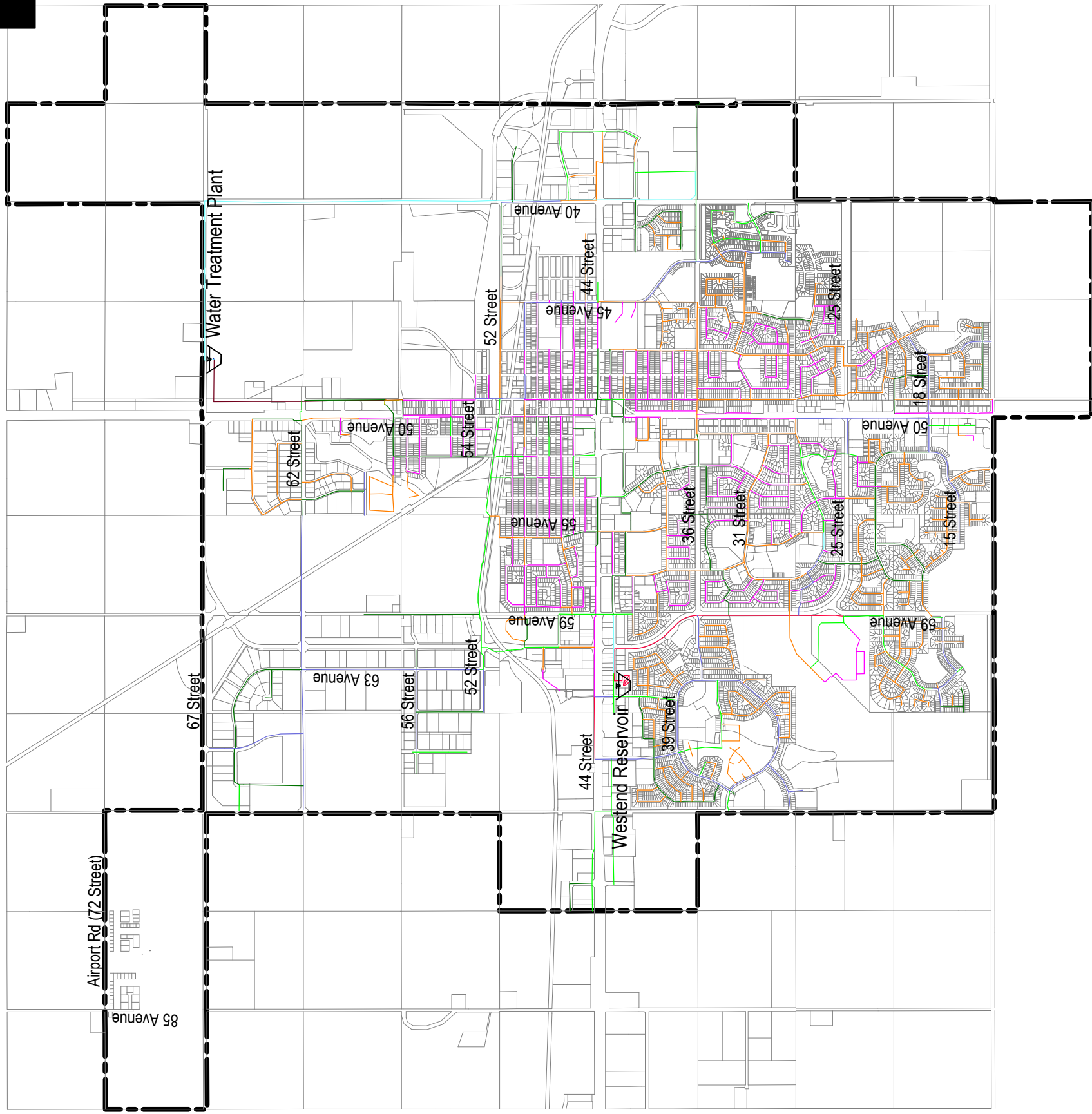
This data was reviewed and analyzed to:

- The identification of trends and relationships between events occurring within the overall system,
- Establish a high level of understanding within the ISL project team, and
- Identify data gaps or shortfalls for follow up with the City.














2.2.1 Project Workshop

A workshop was held on June 15, 2015 with representatives from the City's Utilities Branch and Water Services. Operations staff reviewed the current operation of the system, and identified problem locations such as frequent break locations and low pressure concerns. Key points identified include:

- Filling of the West End Reservoir from the distribution system is controlled by a pressure sustaining valve. That pressure sustaining valve is currently set at 295 kPa (43 psi), however its setting is sometimes lowered to increase the filling rate if reservoir levels are low.
- The dedicated fill line should be constructed with as low an operating pressure as practical to minimize operating costs and pipe size. A preliminary design for the fill line has been previously prepared, and it will be reviewed as part of the master plan.
- The variable speed pumps at the West End Reservoir are currently set at a discharge pressure of 305 kPa (44 psi), however this pressure can be raised as needed to meet system requirements, provided system pressure constraints are observed.
- Although four pumps are present at the West End Reservoir, under current operating conditions typically only two pumps run at any time. This may change, however, when operation shifts such that water is supplied primarily from the West End Reservoir when the dedicated fill line is constructed.
- The option to continue to supply from the WTP in an emergency once the dedicated fill line is in place is desired so fire flows could continue to be provided from two locations in the future, as needed.
- Frequent watermain breaks have been observed on a dead-end old cast iron pipe in the downtown area, possibly due to water hammer. City staff have noted many pin-hole leaks in old cast iron pipe and that the corrosion of bolts on valves and other appurtenances is also common.
- The potential regional water demand may need to be considered in future model scenarios.
- Low pressures have been reported in developments west of the West End Reservoir, affecting lawn irrigation system operation.



Legend

-  City Boundary
 -  <= 150 mm
 -  <= 200 mm
 -  <= 250 mm
 -  <= 300 mm
 -  <= 350 mm
 -  <= 400 mm
 -  <= 450 mm
 -  <= 500 mm
 -  <= 600 mm
 -  <= 750 mm
 -  Other
-  Reservoir / WTP





3.0 Pipe Condition Assessment

As part of this master plan, the City requested a desktop distribution watermain condition assessment. The City's GIS database of pipe data was provided as shapefiles, and this information was used as the starting point of the condition assessment. Figures 3.1 to 3.2 summarize some key pipe data including year of construction (age), pipe material and pipe diameter. From this information, it can be seen that much of the distribution system was constructed in the mid to late 1970's and the 2000's, which were periods of rapid development. As a consequence, much of the system consists of asbestos cement and PVC pipes. Less than 7% of the system has cast iron pipes, however these are clustered in the older downtown zone.

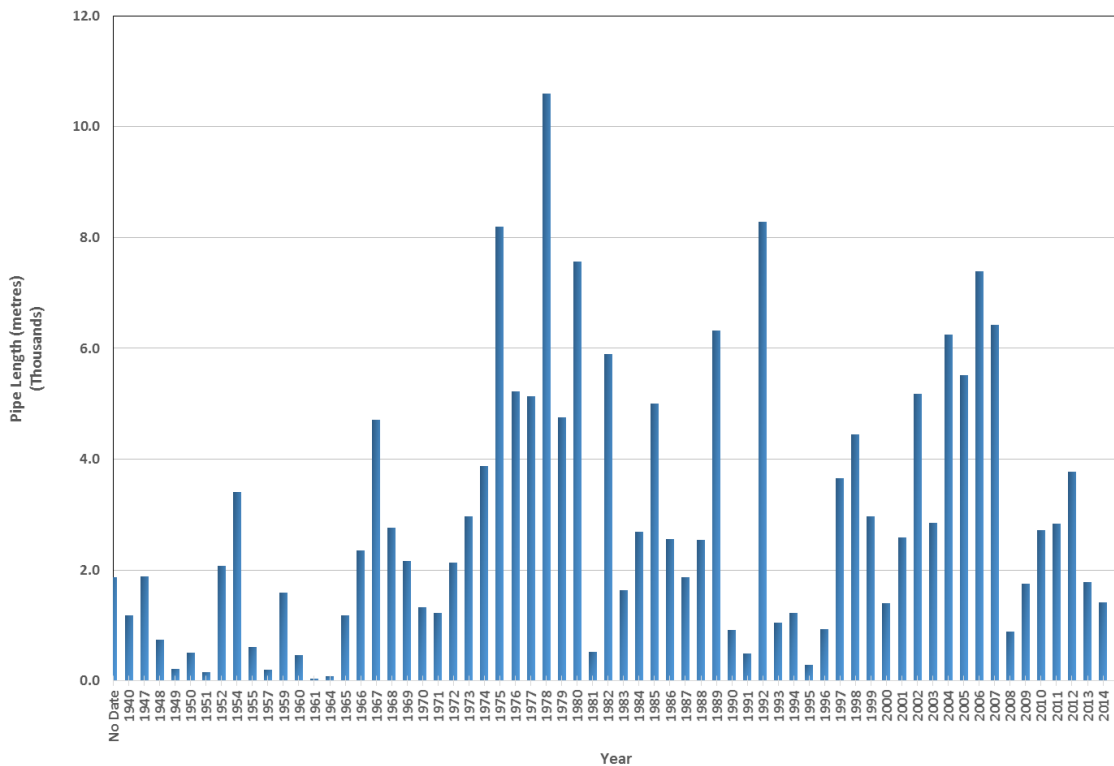


Figure 3.1: Length of Distribution System Pipe Construction by Year from City's GIS (Dated February 13, 2015)

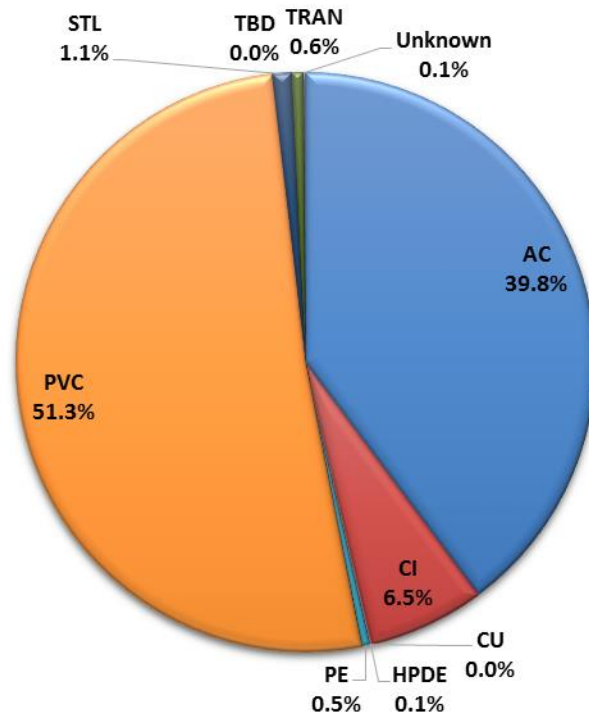


Figure 3.2: Breakdown of Distribution System Pipe Materials from City's GIS (Dated February 13, 2015)

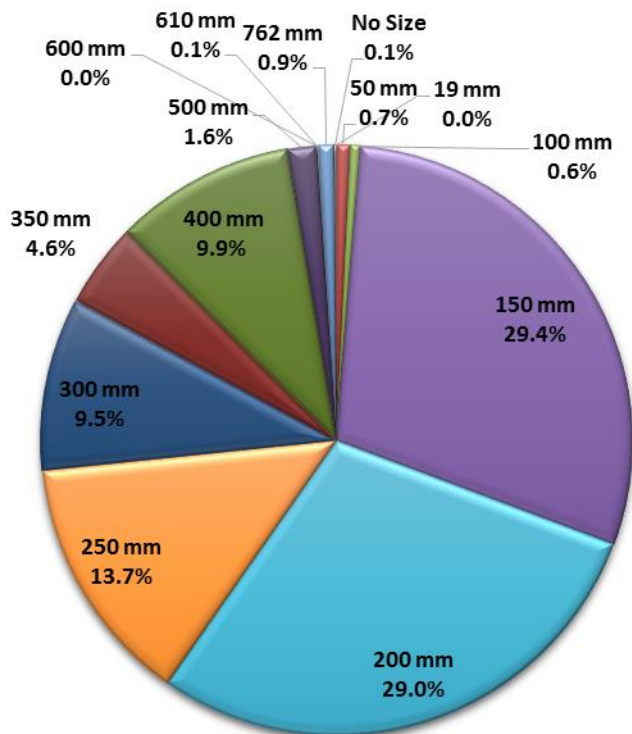


Figure 3.3: Breakdown of Distribution System Pipe Sizes from City's GIS (Dated February 13, 2015)



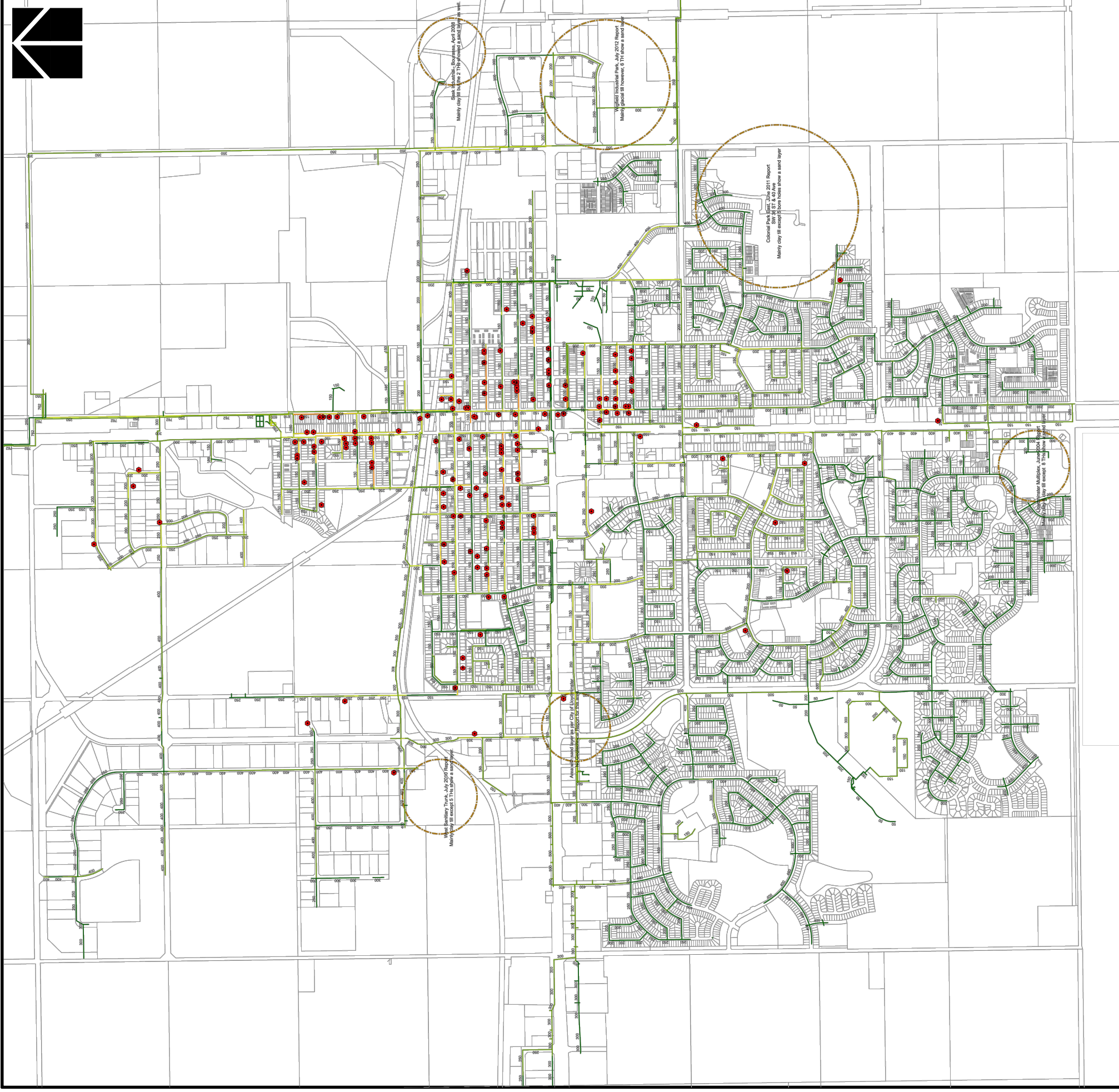
In discussion with City staff, a set of ranking criteria were developed to rank the expected condition of the pipes based on a number of factors. These are listed in Table 3.1, and include break and repair history, age, pipe material, size (large pipes being more critical) and the adjacent land uses. Pipes were assigned point values based on these different criteria, with a high point total meaning the pipe is high priority for replacement. Available geotechnical information from investigations throughout the City was also reviewed to determine if there was a relationship between ground conditions (e.g. clay or sand) and watermain break history, however no correlation could be found.

Table 3.1: Condition Assessment Ranking Criteria

Criteria	GIS Field Name	Max Points	Description
Number of breaks in line	Breaks_Pt	30	Number of breaks x 6
Importance (Areas Served / Affected & Large Diameter)	Importa_Pt	15	Land use: Institutional - 10; Commercial - 8; Industrial - 7; Multifamily - 5; SF Residential - 1; bonus points for diameter > 300 mm - 5
Age	Age_Pts	15	2 point for each 10 years of age to a maximum of 15
Pipe Material	Materia_Pts	10	Cast Iron - 10; AC - 3; PVC and other - 1
Recent History i.e. were they replaced/fixed recently?	History_Pts	30	mainline break repairs since 2010 - 30, mainline break repairs since 2005 - 20, other repairs since 2010 - 10, other repairs since 2005 - 5 (this excludes new services), no repairs - 0
Total Points Possible:	Total_Pts	100	

The purpose of the ranking was to provide a means for determining which pipes are likely to be in the worst condition, such that City staff can make future decisions for replacement when opportunities arise, for example, when road works or other open cut utility work is planned for an area. Furthermore, this information will help the City prioritize areas for rehabilitation programs. In the context of this master plan, existing system hydraulic/fire flow upgrading recommendations (Section 5) have been made in consideration of the expected condition of the pipe so that, when possible, upgrades will preferentially target pipes expected to be in poor physical condition.

Figure 3.4 illustrates the results of the condition assessment ranking. The ranked pipe data was provided back to the City in shapefile format so that the City can use and maintain this data going forward. The data is also included in Appendix D.



Legend

● WaterMainBreaks

Total_Pts

— 0 - 10

— 11 - 20

— 21 - 30

— 31 - 40

— 41 - 50

— 51 - 60

--- Geotech_Locations



4.0 Design Parameters

4.1 Existing Population

A key design parameter for water distribution systems is service population. The population is important as it will:

- Determine the quantity of water required
- Determine the storage volume required
- Impact the sizing requirements for the major water mains within the distribution.

The City of Lloydminster conducted a Municipal Census in 2013, with the population being 31,483. From 1991 to 2013, the City has grown steadily at 3.2% on average, as shown on Table 4.1. The total water distribution system service population in 2014 (at the start of this project) was estimated to be 32,515, based on the 2013 Municipal Census data and a growth rate of 3.2%. For information, City of Lloydminster population data from 1951 to 2014 is shown below in Table 4.1, and plotted on Figure 4.1.

Table 4.1: Summary of the City of Lloydminster Population

Year	Population	Growth Rate (%)	Year	Population	Growth Rate (%)	Year	Population	Growth Rate (%)
1951	3,936	--	1991	17,283	-0.1	2006	24,028	1.6
1956	5,077	5.8	1996	18,953	1.9	2007	25,523	6.2
1961	5,667	2.3	2000	20,564	2.1	2009	26,502	3.8
1966	7,071	5.0	2001	20,988	2.1	2010	27,695	4.5
1971	8,691	4.6	2002	21,618	3.0	2011	27,804	0.4
1976	10,311	3.7	2003	22,267	3.0	2012	30,243	8.8
1981	15,031	9.2	2004	22,935	3.0	2013	31,483	4.1
1986	17,356	3.1	2005	23,643	3.1			

Note:

1. Numbers in bold font are from Statistics Canada; numbers in italic font are from the City's records (water consumption data); and remaining numbers are from the Official Population List, Alberta Municipal Affairs.

4.2 Existing Land Use

Existing land use in the City as indicated by zoning is shown on Figure 4.1. Residential development is found primarily south of Highway 16 (44 Street), with most commercial development found largely in corridors running east-west along Highway 16 as well as north-south along 50 Avenue. The majority of industrial development is found north of Highway 16.

4.3 Population Density

For the purposes of this study, a calculated population of 32,515 people was used in water demand calculations for the existing water distribution system. Based on the area of each type of land use in the service area, the following existing population densities were estimated:

- Low density residential = 36 /ha
- Medium (multi-family) density residential = 57 people/ha

4.4 Future Growth Projections

A meeting between the City of Lloydminster and ISL was held on May 1, 2015 to discuss growth projections. Representatives from the City’s engineering and development planning departments attended alongside ISL team members from our municipal/water resources and land use planning disciplines. Together, a picture of the most likely areas for future development within the next 20 years was developed. Using data from the Lloydminster Comprehensive Growth Strategy (ISL, 2013), ISL mapped predicted development in the 3, 5, 10 and 20 year growth horizons (Figure 4.3), and tabulated populations and land use areas for those lands (Table 4.2, following page 12). In addition, an outlook to potential development in the 40 year horizon was undertaken to enable adequate sizing of the West End Reservoir fill line, although an analysis of an “ultimate” pipe system is not required for the project.

4.5 Existing Water Consumption

The City provided water consumption data for previous years, which was examined to determine the current average day and maximum day consumption rates (Table 4.3 as shown below). Based on historical consumption records provided by the City, the current combined consumption rate for the City which includes residential and non-residential water usage is approximately 340 L/capita/day (Table 4.4).

Historical consumption and consumption rates since 2000 are also plotted on Figure 4.1. Total City water usage has decreased almost every year since 2000, with a maximum rate of 482 L/cap/day in 2001.

It should be noted that based on residential water billing records, the residential (only) water consumption rate (excluding non-residential uses) is approximately 175 L/capita/day.

Table 4.3: Historical Water Consumption – 2008 to 2014

Year:	2008	2009	2010	2011	2012	2013	2014	Average Values
Max. Daily - Single Day (m³/day)	16,554	17,887	15,438	16,804	15,000	16,507	18,176	16,624
Max. Daily Volume - 5 Day Rolling Average (m³/day)	14,680	15,252	13,577	15,066	13,441	13,789	15,012	14,402
Average Daily Volume (m³/day.)	11,021	10,840	10,418	10,889	10,754	10,760	10,942	10,803
Peaking Factor (Single Day)	1.50	1.65	1.48	1.54	1.39	1.53	1.66	1.54
Peaking Factor (Five Day Average)	1.33	1.41	1.30	1.38	1.25	1.28	1.37	1.33

Table 4.2: Population and Land Use Areas for the Various Growth Horizons

GROWTH HORIZON	YEAR	RESIDENTIAL LAND			NON-RESIDENTIAL LAND ADDED					
		GROWTH RATE	ADDITIONAL POPULATION	TOTAL POPULATION	AREA ADDED (ha)	COMMERCIAL (ha)	INDUSTRIAL (ha)	INSTITUTIONAL (ha)	OTHER AND DC (ha)	PARKS & OPEN SPACE (ha)
EXISTING	2014		-	32,515	851	274	504	121	12	77
FUTURE										
3 YEAR	2018	3.3% to 3%	4,254	36,769	193	31	107	0	0	0
5 YEAR	2020	3%	2,213	38,982	112	47	39	0	0	0
10 YEAR	2025	3% to 2.6%	5,549	44,531	169	49	115	0	39	104
20 YEAR	2035	2.6% to 2.1%	11,204	55,735	333	99	171	0	0	13
ULTIMATE (40+ YEAR)	2055+	2.1% to 1.5%	22,153	77,888	715	189	493	0	33	0
SUBTOTAL FUTURE			45,373	-	1,522	415	924	0	72	118
TOTAL EXISTING + FUTURE			-	77,888	2,373	689	1,427	121	84	195

Notes:

1. Year 2014 used as "Existing" base year as it is the last year of water records available. Population extrapolated from the 2013 Municipal Census and 3.3% growth rate.
2. Growth rates are based on the August 2013 Lloydminster Growth Study by ISL, and correspond to the high scenario. Future populations have been adjusted for the most recent census data available after the growth study was published.
2. Total residential area includes low and medium density areas.
3. Total commercial area includes local, central business district (CBD) and/or highway (HWY) commercial areas.
4. Future Institutional land has not been specified; instead this land is lumped with other land uses



Table 4.4: Historical Per Capita Water Consumption (Including Non-Residential Use) – 2008 to 2014

Year:	2008	2009	2010	2011	2012	2013	2014
Average Daily Volume (m³/day)	11,021	10,840	10,418	10,889	10,754	10,760	10,942
Census and Interpolated Population	26,013	26,502	27,153	27,804	29,644	31,483	32,515
Water Consumption (L/cap/day)	424	409	384	392	363	342	337

4.6 Distribution System Design Criteria

In preparation for assessing the performance of the Lloydminster water distribution system, a review of the current (2014) Lloydminster Municipal Development Standards, Section 6.0 (Water) was made to determine the most appropriate design criteria for the City. The City wished to review key criteria, such as fire flow requirements, to ensure they are appropriate for the particular development in Lloydminster and the water system characteristics.

4.6.1 Water Consumption Rates

The current design standards specify design consumption rates which are listed in the “Lloydminster (2014)” column of Table 4.5. The non-residential consumptions listed in Table 4.5 are based on the equivalent populations given in the standards as follows, and are equated to the flow rates using the residential rate of 430 L/cap/day.

- Commercial 37 equivalent people/ha (15,910 L/ha/day)
- Commercial Business District 93 equivalent people/ha (39,900 L/ha/day)
- Industrial 30 equivalent people/ha (12,900 L/ha/day)
- Institutional 37 equivalent people/ha (15,910 L/ha/day)

An estimate of the actual water consumption rates has been made based on available water consumption and billing records. These values are lower than the design values, and are shown in the “Lloydminster – Existing Consumption” column of Table 4.5. The estimated non-residential demands shown on Table 4.5 have been related back to equivalent populations as follows, using the actual residential consumption rate of 175 L/cap/day (determined based on residential billing records).

- Commercial (all combined) 71 equivalent people/ha (12,500 L/ha/day)
- Industrial 23 equivalent people/ha (4,000 L/ha/day)
- Institutional 28 equivalent people/ha (4,900 L/ha/day)

Splitting of existing commercial demands into multiple categories (commercial business district and commercial) was not possible with the available data, and so an average value of 13,000 L/ha/day was estimated. Although the actual average institutional rate is approximately 5,200 L/ha/day, billing records indicate that the hospital’s consumption is approximately 15,000 L/ha/day while individual schools are in the order of 1,000 L/ha/day, depending on land area.

It is typical to set design standards conservatively as the water demand of future developments is unknown and can be highly variable in the case of non-residential demands. Most distribution pipe sizing is determined on the basis of supplying fire flows, with consumptive demands taking up only a fraction of the pipe capacity, so a degree of conservatism is practical. However based on a survey of demand generation rates in other Alberta municipalities (Table 4.5), and the existing consumption rates, some refinements are suggested as listed in Table 4.5.

Following discussions with the City, ISL recommended that the design standards for consumption be adjusted as follows:

- Residential consumption should be reduced to 250 L/cap/day, similar to Edmonton (250) and Grande Prairie (275), which is still conservative compared to the estimated actual consumption of 175 L/cap/day.
- Industrial consumption be split into “light” and “heavy” industrial, with 10,000 L/ha/day and 20,000 L/ha/day, respectively.
- The “commercial business district” category should be renamed or redefined to include both C1 (Central Commercial District, or commercial business district) zoning as well as C2 (Highway Corridor Commercial District) zoning. As it stands, the commercial business district consumption rate zone only applies to C1 downtown areas, whereas many of the high water consuming business such as restaurants and car washes are located on land adjacent to the highways which are zoned C2. Potentially, C5 (Service Commercial District) may be added to this category as well, based on the types of development occurring in this zone. These higher demand areas would have a consumption rate of 26,000 L/ha/day.
- The “commercial” category to be renamed “local commercial”, which would apply for developments such as neighbourhood stores, with a consumption rate of 15,000 L/ha/day.
- Note that the rates given above are general guidelines, and certain industries may require individual calculation of water demands. For example, ADM Agri-Industries uses about 70,000 L/ha/day or 11.5 L/s on average, which is about 9% of the City’s total water consumption in a year.
- Institutional development should be split into schools (10,000 L/ha/day) and hospitals (20,000 L/ha/day).
- Unless there is a particular need for the City to use equivalent populations for non-residential demand calculations, it is recommended that the standards be simplified to instead specify area-based “L/ha/day” rates.

4.6.2 Fire Flow Requirements

Fire flow requirements have been reviewed to assess an appropriate level of protection for the City of Lloydminster. This assessment has been approached from two different angles:

2. What are other municipalities providing for fire flows?
3. What types of development are present in the City which would drive requirements based on the Fire Underwriter’s Survey (FUS) document *Water Supply for Public Fire Protection* (1999).

In the first case, a comparison with other municipalities is contained in Table 4.5. From the perspective of community size and industries present, the City of Grande Prairie (Aquaterra) requirements appear to be a fair comparison. Both cities are relatively small but rapidly growing, with large oil, gas and agricultural industries present. Grande Prairie also has forestry industry located within the city.

For the second approach, FUS calculations were performed for a number of hypothetical building situations likely to be found within Lloydminster. Fire flow requirements can vary based on building construction material, building spacing, occupancy (type of use such as storage of flammable materials), presences of sprinkler systems, and floor area. None of the hypothetical combinations tested required a fire flow of 300 L/s, and based on the results an upper end value in the order of 200 to 250 L/s appears reasonable.

Therefore based upon these calculations and in alignment with Grande Prairie, a maximum fire flow requirement of 225 L/s for high value properties is recommended, as shown in Table 4.5. In addition, it is recommended that multi-family requirements be split into requirements for townhouses, medium-density, and high density multi-family residential. All recommended fire flows are listed in the “Lloydminster – Recommended (2015) DRAFT” column of Table 4.5.

Fire flow durations listed in the standards are also recommended to be changed to match FUS guidelines, and will vary from 2 to 3 hours. In the current City standards durations range from 1.5 to 4 hours.

Table 4.5: Water Distribution System Standards Comparison

Standard	Municipality										
	Lloydminster (2014)	Lloydminster - Existing Consumption	Lloydminster - Recommended (2015) DRAFT	"Typical" FUS Suggested Minimum Requirements	Grande Prairie (Aquaterra) (2015)	Edmonton (EPCOR) (2013)	Fort Saskatchewan (2013)	St. Albert (2013)	Leduc (2006/2014)	Rocky Mountain House (2007)	Hinton (2007)
Residential Consumption (L/cap/day)	430	175	250		275	250	360	350	300	375	400
Industrial (L/ha/day)	12,900	4,200 (approx)	10,000 (light) or 20,000 (heavy)		10,000 (light) or 20,000 (heavy)	NS	17,280	25,000	16,875	17,280	16,875
Commercial (L/ha/day)	15,910 or 39,990 (CBD)	13,000 (approx)	15,000 (Local) or 26,000 (Hwy)		20,000 (Local) or 26,000 (Hwy)	NS	17,280	25,000	22,500	17,280	22,500
Institutional (L/ha/day)	15910	5,200 (average, approx)	20,000 (hosp) 10,000 (school)		20,000 (school) 30,000 (hosp)	NS	17,280	25,000	NS	17,280	NS
Max Day Demand Factor	2	1.5	2		2	1.7 (residential)	2	2	2	2	2
Peak Hour Demand Factor	3	Unknown	3		3	3 (residential)	3	4	4	4	4
Single Family Residential Fire Flow (L/s)	92	-	100	67 - 100 L/s depending on house spacing (0-10m)	95	100	100	FUS	115	FUS or minimum 75	115
Multi-Family Residential Fire Flow (L/s)	303	-	150 (Twnh), 185 (Med) or 225 (High)	133 (Twnh)	150 (Twnh), 185 (Med) or 225 (High)	180 (mid-value) or 300 (high-value)	133	FUS	227	FUS	FUS
Commercial Fire Flow (L/s)	227 or 303 (CBD)	-	185 (Local) or 225 (Hwy)		150 (Local) or 225 (Hwy)	300	233	FUS	227	FUS	FUS
Industrial Fire Flow (L/s)	227	-	225		225	300	183	FUS	227	FUS	FUS
Institutional Fire Flow (L/s)	303	-	225		225	300	183	FUS	227	FUS	FUS

Notes:

- FUS denotes fire flows to be calculated using Fire Underwriters Survey methods
- NS = Not Specified, depends on development
- Lloydminster expresses non-residential demands in terms of equivalent populations/ha, which equate to the above demand rates when multiplied by the design residential demand rate.
- CBD = Commercial Business District
- Hwy = Highway Commercial
- Twnh = Townhouse (also includes Mobile Home Parks)
- Existing Lloydminster consumption for residential land uses is based on the 2014 residential consumption supplied by the City, divided by the 2014 population.
- Existing Lloydminster consumption for non-residential land uses is based on the total non-residential (commercial) consumption supplied by the City, which has been portioned out between the land uses based on the relative values of the non-residential design standard rates. These values are estimates and may or may not be representative of the actual consumption for the land use, but the total non-residential consumption relative to residential consumption is accurate. The actual average non-residential consumption rate is about 6,400 L/ha/day.
- Existing Lloydminster consumption for institutional land uses is on average approximately 4,200 L/ha/day estimated as in Note 8 above, however based on water billing records the hospital has a demand of approximately 15,000 L/ha/day while schools are approximately 1,000 L/ha/day.



The standards also specify maximum pipe flow velocities of 1.5 m/s, with maximum velocities typically occurring during fire flows. This value may be overly restrictive resulting in artificially low fire flow analysis results, and the City should raise this to 3.0 m/s similar to EPCOR in Edmonton. Note that not all municipalities specify a velocity requirement.

Finally, it is recommended that the last sentence of Section 6.2 in the standards regarding automatic sprinkler systems be struck and replaced with a comment that sprinkler systems designed in accordance with the FUS can reduce the fire flow requirements for specific properties.

4.6.3 Pressure Requirements

Following a review of available information, ISL recommended that the maximum allowable distribution pressure specified in the standards be reduced to 700 kPa (102 psi) from 1050 kPa (152 psi), consistent with EPCOR and other municipalities within Alberta. This recommendation was made on the basis that pressures above 700 kPa can damage building systems such as hot water tanks, and may require the installation of on-lot pressure reducing valves. Transmission lines pressures may be higher, if necessary and depending on pipe material, provided no services are present.

ISL also recommended that the minimum fire pressure at the main should be adjusted from 140 kPa (20 psi) to 150 kPa (22 psi) in accordance with the FUS.

4.6.4 Summary of Lloydminster Design Criteria Updates

The recommended demand rates, fire flow requirements and other updates to the City of Lloydminster design standards are summarized in Table 4.6 below. These values were reviewed and agreed upon by the City, and will form the basis of the master plan.

Table 4.6: Recommended Lloydminster Water System Design Standards

Recommended Standards	
Consumption	
Residential Consumption	250 L/cap/day
Industrial	10,000 L/ha/day (light) or 20,000 L/ha/day (heavy)
Commercial	15,000 L/ha/day (Local) or 26,000 L/ha/day (Hwy)
Institutional	20,000 L/ha/day (hospital) 10,000 L/ha/day (school)
Max Day Demand Factor	2
Peak Hour Demand Factor	3
Fire Flow Requirements	
Single Family Residential Fire Flow	100 L/s [360 m ³ /hr]
Multi-Family Residential Fire Flow	150 L/s (Townhouse), 185 L/s (Med Density) or 225 L/s (High Density) [540 m ³ /hr, 666 m ³ /hr or 810 m ³ /hr]
Commercial Fire Flow	185 (Local) or 225 (Hwy) [666 m ³ /hr or 810 m ³ /hr]

Recommended Standards	
Industrial Fire Flow	225 L/s [810 m ³ /hr]
Institutional Fire Flow	225 L/s [810 m ³ /hr]
Maximum Pipe Velocity (Design)	3 m/s (10 ft/s)
Pressure Requirements	
Maximum Distribution Pressure	700 kPa (102 psi)
Minimum Pressure under Peak Hour Demand	273 kPa (40 psi)
Minimum Residual Pressure under Fire Flow	150 kPa (22 psi)

4.7 Future Water Demands

Based on the growth horizons established in Section 4.4, and using the updated proposed Lloydminster design criteria listed above (Table 4.6), projections of future water demands have been made as listed on Table 4.7. These demands will be used throughout the master plan for distribution system, storage and water treatment plant assessment, unless otherwise noted.

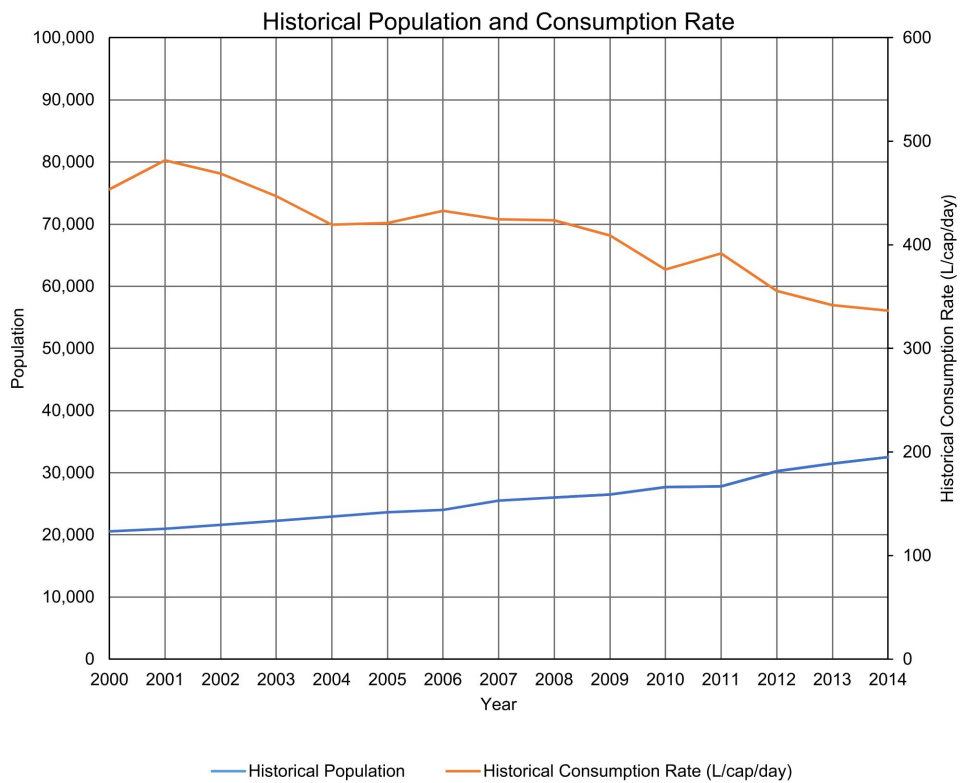
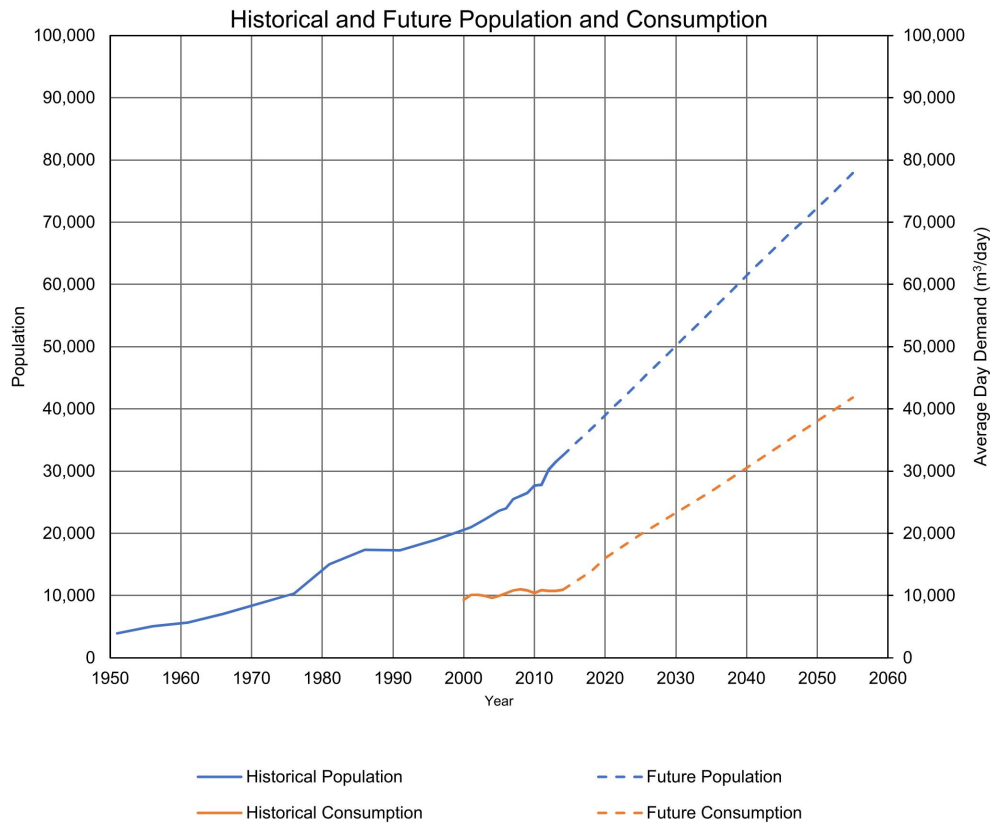
Table 4.7: Summary of Total Cumulative Demands at Each Growth Horizon

GROWTH HORIZON	YEAR	ADD				MDD				PHD						
		RES	NON-RES	TOTAL	RES	NON-RES	TOTAL	RES	NON-RES	TOTAL	RES	NON-RES	TOTAL			
		L/s	L/s	m ³ /hr	L/s	L/s	m ³ /day	L/s	L/s	m ³ /day	L/s	L/s	m ³ /day			
EXISTING	2014	66	61	127	456	10,942	132	122	253	912	21,886	198	182	380	1368	32,829
3 YEAR	2018	78	82	161	578	13,874	156	165	321	1156	27,748	235	247	482	1734	41,621
5 YEAR	2020	85	101	186	668	16,031	169	202	371	1336	32,062	254	303	557	2004	48,092
10 YEAR	2025	101	129	230	826	19,836	201	258	459	1653	39,672	302	387	689	2479	59,508
20 YEAR	2035	133	177	310	1115	26,753	266	353	619	2229	53,507	399	530	929	3344	80,260
ULTIMATE (40+ YEAR)	2055+	197	287	484	1743	41,825	394	574	968	3485	83,650	591	861	1452	5228	125,475

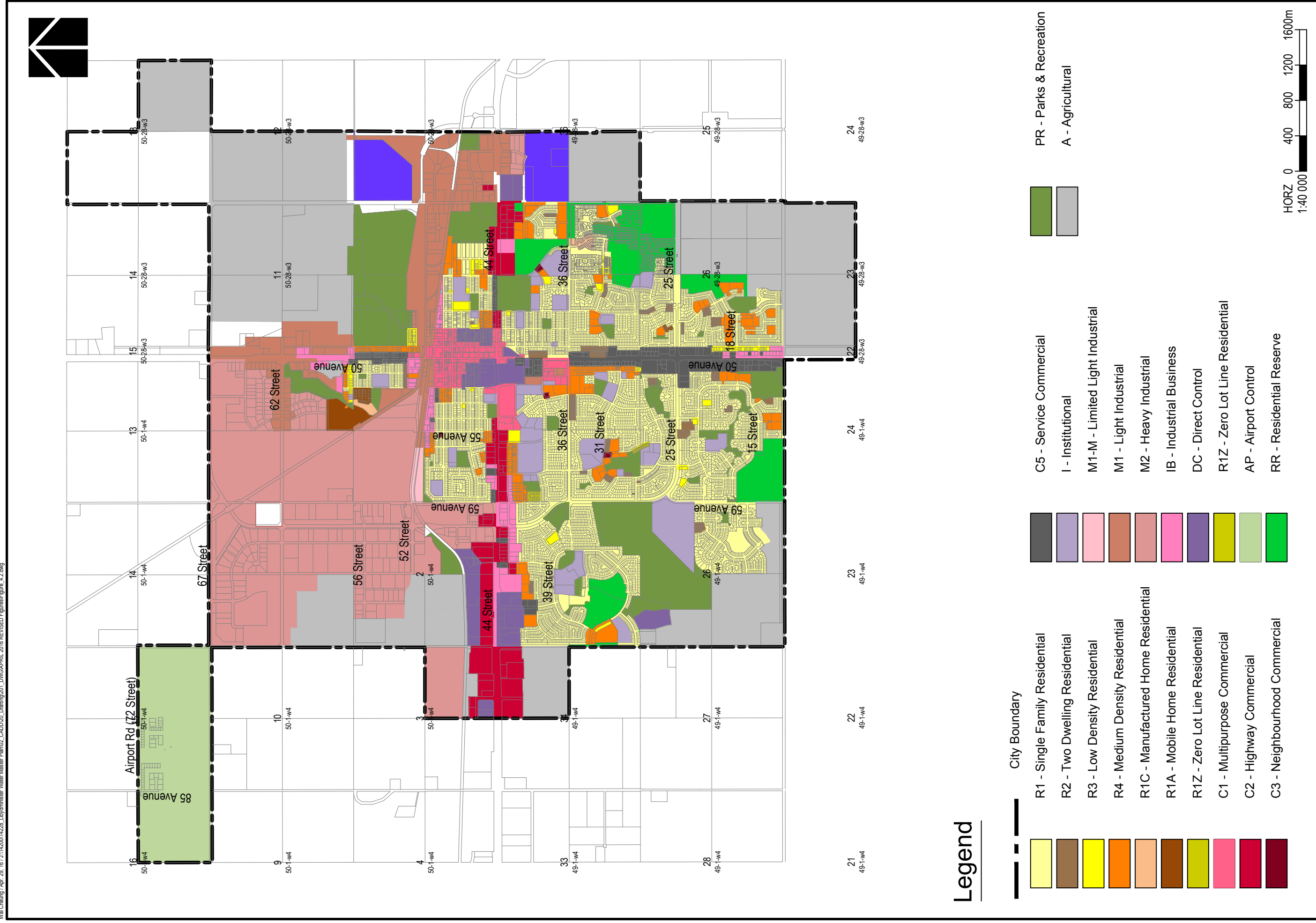
Notes:

- RES = Residential, NON-RES = Non-Residential
- Year 2014 used as "Existing" base year as it is the last year of water records available. Rounding error in demand calculations results in the 1 m³/day difference between model "Existing" ADD demand (10,942 m³) and 2014 average consumption (10,943 m³).
- MDD and PHD are based on the design peaking factors of 2 and 3, respectively. The actual MDD peaking factor based on historical records is approximately 1.5 to 1.6.

Was Cheung / Apr. 28, 16 / J:\142001\14228_Lloydminster Water Master Plan\02_CADD\00_Drafting\2016_REVISED\Figures\Figure_4.1.dwg



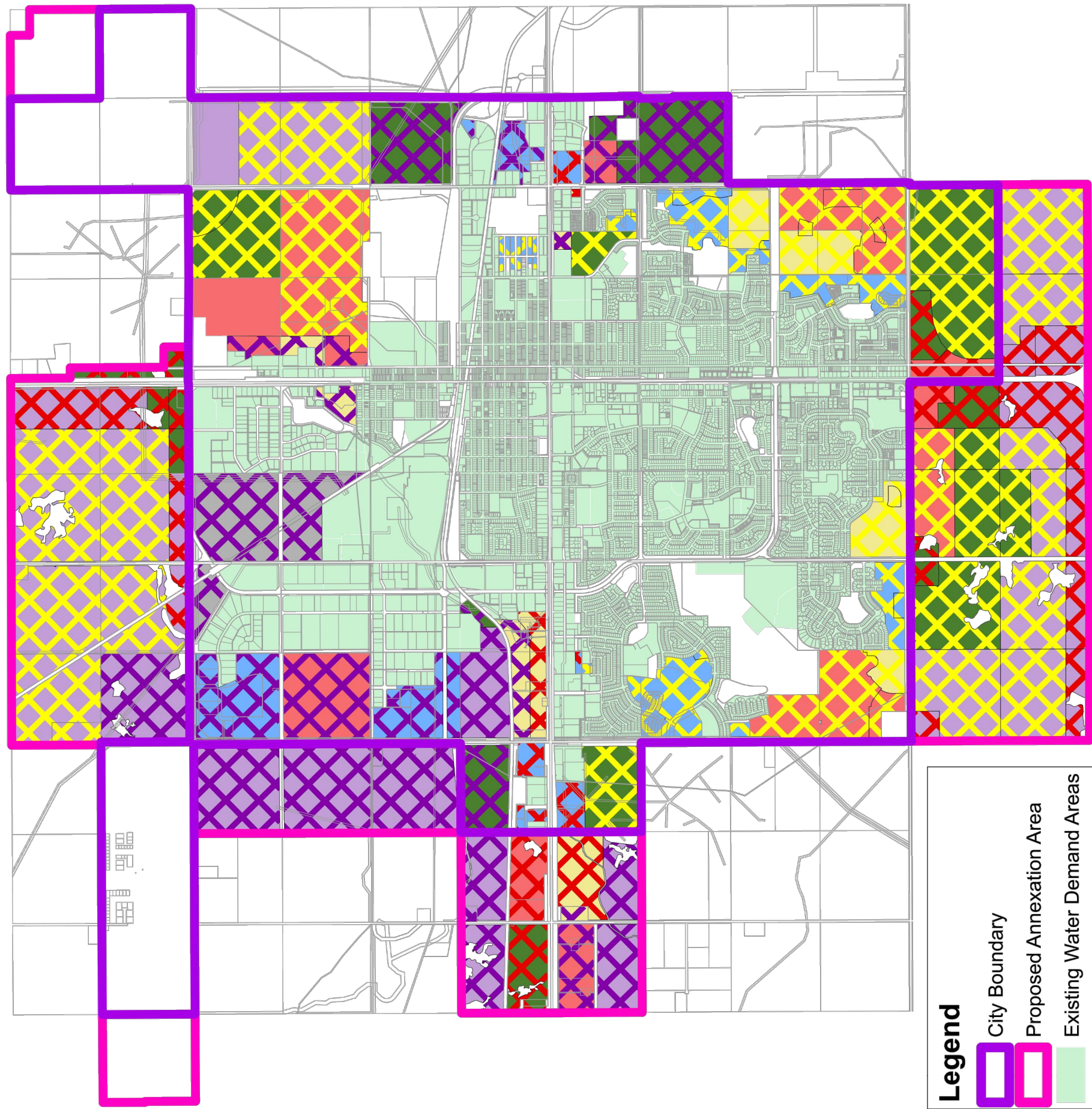
LLOYDMINSTER














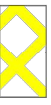
Legend

- City Boundary
- R1 - Single Family Residential
- R2 - Two Dwelling Residential
- R3 - Low Density Residential
- R4 - Medium Density Residential
- R1C - Manufactured Home Residential
- R1A - Mobile Home Residential
- R1Z - Zero Lot Line Residential
- C1 - Multipurpose Commercial
- C2 - Highway Commercial
- C3 - Neighbourhood Commercial
- C5 - Service Commercial
- I - Institutional
- M1-M - Limited Light Industrial
- M1 - Light Industrial
- M2 - Heavy Industrial
- IB - Industrial Business
- DC - Direct Control
- R1Z - Zero Lot Line Residential
- AP - Airport Control
- RR - Residential Reserve
- PR - Parks & Recreation
- A - Agricultural

HORZ 0 400 800 1200 1600m
1:40 000



Legend

-  City Boundary
-  Proposed Annexation Area
-  Existing Water Demand Areas
- Future Water Demand Areas**
-  3 Year Horizon
-  5 Year Horizon
-  10 Year Horizon
-  20 Year Horizon
-  40 Year Horizon
-  Beyond 40 Years
- Land Use**
-  Commercial
-  Industrial
-  Residential

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.



5.0 Existing System Assessment

5.1 Existing System WaterCAD Model

A new hydraulic computer model of the existing water distribution system was developed using WaterCAD V8i (SELECTSeries 5) software by Bentley. WaterCAD is a powerful analysis tool that utilizes pump curve data and routes flow through the physical distribution system. In this manner, pressure results are obtained, and available fire flow at any location in the water distribution system can be determined based on the physical system data input to the model.

A new existing system model was created for this project by importing only the previous City WaterCAD model pipes and junctions elements into a fresh model file. Pipe location, material and size were compared to the City's GIS database information for confirmation of the network data. All other model data such as Hazen-William 'C' values were newly generated for this project. For new development areas, pipe information was entered into the model based on the GIS database. Record or construction drawings were obtained for areas where there were missing or conflicting information within the GIS database. In addition, a digital surface developed from 1 m LiDAR data was used to import ground elevation data into the model.

Pump information including pump curves, operational data, and control set point information was obtained from City. The appropriate pump data was then entered into the model. Refer to Table 5.1 below for a summary of the physical pump information.

Table 5.1: Pump Specifications

Pump Name	Location	Year Installed or Rebuilt	Pump Type and Logic	Variable Speed Set Point Pressure ¹ (kPa)	Variable Speed Set Point Head (m)	Elevation (m)	Design Head (m)	Design Discharge ² (L/s)	Design Hydraulic Grade (m)	Operating Hydraulic Grade (m)
VSP1	West End Reservoir	2005	Variable Speed	305-375	31.1-35.2	664.7	42.7	103	707.4	695.8 – 702.9
VSP2	West End Reservoir	2005	Variable Speed	305-375	31.1-35.2	664.7	42.7	103	707.4	695.8 – 702.9
P3	West End Reservoir	2005	Constant Speed	--	--	664.7	42.7	103	707.4	695.8 – 702.9
P4	West End Reservoir	2005	Constant Speed	--	--	664.7	42.7	103	707.4	695.8 – 702.9
PWP 101	WTP	2003	Constant Speed	--	--	636.25	61.0	189	697.2	703.5
PWP 102	WTP	2003	Constant Speed	--	--	636.25	61.0	189	697.2	703.5
PWP 103	WTP	2003	Variable Speed	660	67.3	636.25	61.0	189	697.2	703.5

Notes:

1. Pressures converted to psi are as follows: 305 kPa = 44 psi, 375 kPa = 54 psi, 660 kPa = 96 psi
2. A discharge of 103 L/s is equivalent to 371 m³/hr, while 189 L/s is equivalent to 680 m³/hr.

5.2 Water Demands

Demand areas or catchments for the City were developed based on land use plans and the spatial location of the water distribution network. Each demand area is associated with an input node in the model. For each demand area, the total catchment area and area of residential, commercial, industrial and institutional development were tabulated. Water consumption rates for existing development within the City for each zoning classification were determined based on the total area in the service area for each zoning type, as well as population and historical consumption data. Based on this data, and considering typical water consumption rates for different development types, the estimated average daily water demand for each type of existing development in the service area is:

- Residential (SF and MU) = 175 L/person/day
- Industrial = 4,200 L/ha/day
- Commercial = 13,000 L/ha/day
- Commercial Business District = 13,000 L/ha/day
- Institutional = 5,200 L/ha/day

Model demands were then calculated using the current estimated average daily water demand for each category of development and the appropriate peaking factors. Based on the City's Municipal Development Standards (March 2014), the peaking factors are as follows:

- Maximum Day Demand (MDD) – $2.0 \times$ Average Day Demand (ADD)
- Peak Hour Demand (PHD) – $3.0 \times$ Average Day Demand (ADD)

In this fashion the current average day, maximum day and peak hour demands were updated for all demand nodes in the existing system. These calculations are provided in Appendix A (Table A1).

On the basis of these derived water consumption rates, the existing water demands were then entered into the existing model for each of the three scenarios:

- Average Day Demand (ADD)
- Maximum (Peak) Day Demand (MDD)
- Peak Hour Demand (PHD)

5.3 Calibration and Validation of the WaterCAD Model

5.3.1 Model Calibration

After development of the new hydraulic computer model of the existing water distribution system, calibration was required to refine the Hazen-Williams “C” values for pipe roughness, and to confirm if the pumphouse operation was properly represented in the model (compare actual pump performance compared to pump curve data).

To obtain data to calibrate the model, hydrant flow testing at nine locations was conducted on October 15 and 16, 2014 by SFE Global. Figure 5.1 shows the location of the hydrant flow tests. Table 5.2 lists the hydrant flow test data obtained including static pressure, flow during 1 port tests, and residual hydrant pressure during the flowed tests. Appendix B contains the SFE Global fire flow testing reports as well as a summary memo prepared by ISL.

In general, to calibrate, first the field “static” hydrant and pumphouse pressures were compared to the model values to test the calibration of the model pumphouses (West End Reservoir (WR) and Water Treatment Plant (WTP)). Adjustments to pump curves and control settings are made as required to match the model pumphouse results to the field records. Then the measured hydrant flows were entered into the model for

Table 5.2: Hydrant Flow Test Field Data

Hydrant Test	Pressure Zone	Date	Time of Test	Test Type	WTP Pump Operation	WR Pumphouse Operation	Flow Hydrant		Residual Hydrant		WR Pumphouse Pressure		WTP Pressure	
							Flow (L/s)	HGL (m)	Pressure (kPa)	HGL (m)	Pressure (kPa)	HGL (m)	Pressure (kPa)	HGL (m)
1	Main	October 15, 2014	1:38 PM to 1:46 PM	Static	PWP 101 & 103 ON	Pumps locked out	0	700.5	593	694.8	294	694.8	657	703.2
				1 port			105	691.4	504	694.7	293	694.7	678	705.4
2a	Main	October 15, 2014	2:18 PM to 2:25 PM	Static	PWP 101 & 103 ON	Pumps locked out	0	696.6	407	694.9	295	694.9	662	703.7
				1 port			86	693.9	380	694.8	294	694.8	685	706.1
2b	Main	October 15, 2014	2:38 PM to 2:51 PM	Static	PWP 101 & 103 ON	Pumps locked out	0	703.7	476	694.6	292	694.6	693	706.9
				1 port			84	692.5	366	695.0	296	695.0	682	705.8
3	Main	October 16, 2014	1:51 PM to 1:57 PM	Static	PWP 101 & 103 ON	Pumps locked out	0	695.9	414	694.8	294	694.8	636	701.1
				1 port			80	693.1	386	694.9	295	694.9	692	706.8
4	Main	October 16, 2014	11:22 AM to 11:26 AM	Static	PWP 101 & 103 ON	Pumps locked out	0	697.8	511	694.8	294	694.8	648	702.3
				1 port			39	673.8	276	694.9	295	694.9	694	707.0
5	Main	October 16, 2014	10:41 AM to 10:46 AM	Static	PWP 101 & 103 ON	Pumps locked out	0	697.1	518	694.6	292	694.6	650	702.5
				1 port			73	682.3	373	695.4	300	695.4	683	705.9
6	Main	October 16, 2014	9:01 AM to 9:11 AM	Static	PWP 101 & 103 ON	Pumps locked out	0	695.2	397	694.9	295	694.9	654	702.9
				1 port			90	692.8	373	693.8	284	693.8	701	707.7
7	Main	October 16, 2014	11:56 AM to 12:02 PM	Static	PWP 101 & 103 ON	Pumps locked out	0	695.3	559	694.8	294	694.8	653	702.8
				1 port			102	688.3	490	694.7	293	694.7	694	707.0
8	Main	October 16, 2014	9:32 AM to 9:41 AM	Static	PWP 101 & 103 ON	Pumps locked out	0	695.5	435	694.9	295	694.9	654	702.9
				1 port			70	679.0	273	695.1	297	695.1	696	707.2
9	Main	October 16, 2014	8:37 AM to 8:43 AM	Static	PWP 101 & 103 ON	Pumps locked out	0	695.5	352	694.9	295	694.9	678	705.4
				1 port			84	692.6	324	692.9	276	692.9	700	707.6

Note:

1. At WTP, the following pump operation occurred: PWP 101 ON Constant Speed, PWP 103 VFD ON.
2. At the West End Reservoir (WR), the pumps were locked out during the tests.
3. West End Reservoir Pumphouse Elevation = 644.7 m, WTP Pumphouse Elevation = 636.25 m



each test and the pipe “C” values were adjusted in an attempt to match the modeled and field test residual hydrant pressures. The calibrated ‘C’ values based on the October 2014 testing are as follows:

- PVC: C = 130
- Cast Iron C = 90
- Asbestos Cement (AC): C = 90
- Steel: C = 100 (except main supply line from WTP has C=90)

The results of the calibration are summarized in Table 5.3 (following page 20) and Table 5.4 (as shown below). Calibration in the distribution system at the residual pressure test hydrants is reasonably good, with no consistent bias in the model error. The *Water Distribution Systems Handbook* (Mays, 2000) indicates that for planning purposes, a maximum pressure deviation of 10% between field and model values is generally satisfactory.

Table 5.4: Summary of Model Calibration Pressure Error Results

Model Pressure Error Statistics	Location		
	Residual Hydrants	West End Reservoir Pumphouse	WTP
Static Pressure Error Range	-9 to 27 kPa (-1 to 4 psi)	-17 to 40 kPa (-2 to 6 psi)	-46 to -4 kPa (-7 to -1 psi)
Static Pressure Percent Error Range	-2% to 7%	-6% to 14%	-7% to -1%
Average Static Pressure Error	5 kPa (1 psi)	7 kPa (1 psi)	-22 kPa (-3 psi)
1 Port Flow Pressure Error Range	-54 to 26 kPa (-8 to 4 psi)	14 to 47 kPa (2 to 7 psi)	-3 to -2 kPa (0 psi)
1 Port Flow Pressure Percent Error Range	-11% to 8%	5% to 16%	0%
Average 1 Port Flow Pressure Error	-1 kPa (0 psi)	27 kPa (4 psi)	-2 (0 psi)

Note:

1. Positive values indicate that the model pressure values are higher than the field values.
2. Tests 4 and 8 have been disregarded for 1 port flow. See Table 5.3 (following page 20).

Several comments on the hydrant flow test results and details of the model calibration follow below:

- During the hydrant flow tests, the WTP pumps were manually ramped up to in order to maintain a similar or higher discharge pressure coming out of the WTP. As a result the WR pumps were not operating during the tests, and instead the reservoir was being filled.
- In addition to the water demands discussed above, in setting up the model for calibration, the City demands during the hydrant flow tests were adjusted based on the static (no flow) condition before the tests. This was done to ensure that the model was simulating the correct demands for each test site in order to account for the natural daily variation in demands.
- To work around the manual adjustment of the WTP pumps that occurred during the testing, the existing system model has been calibrated with the WTP pumps turned off and instead a reservoir set to the field HGL at the WTP to represent the discharge pressure leaving the WTP. To simplify model calibration, the WR fill valve was turned “off” in the model, and instead a demand was entered into the model at the WR location to represent the fill demand at the WR. These steps were done because there was difficulty in getting the model WTP pumps to represent field conditions during model calibration because of manual adjustments made at the WTP in the field during the tests. Note that for static conditions, the model WTP pumps were turned “on” and those results matched reasonably well to the field conditions.

- For Hydrant Flow Test Site 4 for the 1 port (flow) test, the model residual hydrant pressure is about 86 kPa higher than expected. This may be due to additional demands that appear to be occurring in the system based on the balance of flows at the WTP, WR and hydrant (note that there is about a 30 L/s discrepancy in the field system flow balance for this test compared to other tests). The City indicated that supply to ADM Agri-Industries at up to 42 L/s may be occurring during the test, which would bring down the overall system pressures. Therefore, this test is not reliable.
- For Hydrant Flow Test Site 8 for the 1 port (flow) test, it is suspected that during the test a valve was closed, hence the model residual hydrant pressure is higher (by 118 kPa or 17 psi) than the field result. By closing the pipe located at approximately 18 Street and 50 Avenue in the model, to simulate a closed valve, the model results compare much better to the field result (model result is 30 kPa or 4 psi lower than field result). It is recommended that valves within the vicinity of 18 Street and 50 Avenue and Test Site 8 be fully open to ensure that adequate fire flows can be provided.
- A low C value for Asbestos Cement pipes (C=90) was necessary to achieve calibration. This low C value could be a function of old, small diameter hydrant leads and old hydrants, or other system conditions that introduce additional headlosses. Otherwise, it is expected that the pipe C value would be closer to 120 or 130.
- As an example additional unknown headlosses, the City is aware of one or more “blockages” in the system on the major watermain downstream of the WTP, the location(s) of which are unknown. Since these “blockages” are not represented hydraulically in the model, they instead affect the calibrated “C” values in unpredictable ways depending on the location of the test sites relative to the “blockages”. The City has been testing the system over the past few years to isolate these blockages, but has not been completely successful. In Fall, 2015 they did find a location at 49 Avenue and 50 Street where they City’s GIS incorrectly showed that the 400 mm main was tied into the adjacent local pipes, when in reality they were not connected. The model was constructed with these tie-ins already in place according to the GIS and the model calibration is based upon a presumption of free flow at the end of this 400 mm main when in fact there was not at the time of the fire flow tests. The City subsequently completed these tie-ins during Fall 2015.
- It is recommended that the City perform additional fire flow testing and review the calibration of the water model once all “blockages” have been resolved.

5.3.2 Model Validation

To test the operation of the West End Reservoir pumphouse and to confirm some uncertain results from the October 2014 testing, a second round of hydrant flow testing was conducted on July 9, 2015 to collect data for model validation. The locations of the additional tests are shown on Figure 5.1 and are selected based on the following:

- **Hydrant Flow Test Site A** - Located at a new hydrant installed on an older 1982 AC main. Previous tests were of old hydrants on old AC mains. This test would help confirm or disprove the low C value calibrated for AC pipes.
- **Hydrant Flow Test Site B** - Located near the previous Test Site 1. Test 1 had shown a relatively large discrepancy between model and field values, potentially due to the calibrated low C value for AC pipe. This test would help confirm or disprove the low C value calibrated for AC pipes.
- **Hydrant Flow Test Site C** - Located near the 500 mm main extending from the WR. This test will help confirm the performance of the WR pumphouse.
- **Hydrant Flow Test Site D** - Located at the previous Test Site 4 which generated erroneous results in 2014. This test confirms the C value for cast iron pipe, and is a test on a small diameter dead-end pipe.
- **Hydrant Flow Test Site E** - Located near the previous Test Site 8 which had unexpected results in 2014. This test would confirm if a valve in the area was/is closed.

As well, all validation tests were conducted using only the WR pumps with the WTP pumps turned off, in order to test the field performance of the WR pumphouse compared to the model results.

Table 5.3: Calibrated Model Comparison with Hydrant Flow Test Results

Hydrant Test	Pressure Zone	Test Type	Flow Hydrant	Residual Hydrant							WR Pumphouse Pressure							WTP Pressure						
			Flow (L/s)	Field P (kPa)	Field HGL (m)	Model P (kPa)	Model HGL (m)	Model Error (kPa)	Model Error (%)	Model Error (m)	Field P (kPa)	Field HGL (m)	Model P (kPa)	Model HGL (m)	Model Error (kPa)	Model Error (%)	Model Error (m)	Field P (kPa)	Field HGL (m)	Model P (kPa)	Model HGL (m)	Model Error (kPa)	Model Error (%)	Model Error (m)
1	Main	Static	0	593	700.5	592	699.9	-1	0	-0.6	294	694.8	302.0	695.6	8	3	0.8	657	703.2	637	701.2	-20	-3	-2.1
		1 port	105	504	691.4	450	686.0	-54	-11	-5.4	293	694.7	306.7	694.3	14	5	-0.3	678	705.4	675	705.3	-3	0	-0.1
2a	Main	Static	0	407	696.6	434	697.5	27	7	0.9	295	694.9	307.4	696.1	12	4	1.3	662	703.7	637	701.2	-25	-4	-2.5
		1 port	86	380	693.9	403	696.3	23	6	2.4	294	694.8	317.4	695.4	23	8	0.6	685	706.1	683	706.0	-2	0	-0.1
2b	Main	Static	0	476	703.7	502	701.8	26	5	-1.9	292	694.6	332.4	698.7	40	14	4.1	693	706.9	648	702.3	-46	-7	-4.6
		1 port	84	366	692.5	355	691.4	-11	-3	-1.0	296	695.0	343.0	698.1	47	16	3.1	682	705.8	680	705.7	-2	0	-0.1
3	Main	Static	0	414	695.9	405	696.1	-9	-2	0.2	294	694.8	277.0	693.0	-17	-6	-1.7	636	701.1	632	700.7	-4	-1	-0.4
		1 port	80	386	693.1	393	693.8	7	2	0.7	295	694.9	308.6	694.5	14	5	-0.3	692	706.8	690	707.7	-3	0	0.9
4	Main	Static	0	511	697.8	503	696.6	-8	-2	-1.2	294	694.8	291.1	694.5	-3	-1	-0.3	648	702.3	634	700.9	-14	-2	-1.4
		1 port	39	276	673.8	361	682.5	85	31	8.7	295	694.9	328.8	696.6	34	11	1.7	694	707.0	691	706.9	-3	0	-0.1
5	Main	Static	0	518	697.1	514	695.9	-4	-1	-1.2	292	694.6	296.0	695.0	4	1	0.4	650	702.5	633	700.8	-17	-3	-1.7
		1 port	73	373	682.3	379	683.0	6	2	0.7	300	695.4	318.6	695.6	19	6	0.2	683	705.9	681	705.8	-2	0	-0.1
6	Main	Static	0	397	695.2	406	695.3	9	2	0.1	295	694.9	300.6	695.4	6	2	0.6	654	702.9	635	700.9	-20	-3	-2.0
		1 port	90	373	692.8	394	695.0	21	6	2.2	284	693.8	324.0	696.1	40	14	2.4	701	707.7	699	707.6	-2	0	-0.1
7	Main	Static	0	559	695.3	569	695.5	10	2	0.2	294	694.8	299.2	695.3	5	2	0.5	653	702.8	635	701.0	-18	-3	-1.8
		1 port	102	490	688.3	467	686.0	-24	-5	-2.3	293	694.7	323.2	696.0	30	10	1.4	694	707.0	692	706.9	-2	0	-0.1
8	Main	Static	0	435	695.5	434	695.2	-1	0	-0.3	295	694.9	298.8	695.3	4	1	0.4	654	702.9	636	701.1	-18	-3	-1.8
		1 port	70	273	679.0	391	691.1	118	43	12.1	297	695.1	317.6	695.5	21	7	0.4	696	707.2	694	707.1	-2	0	-0.1
9	Main	Static	0	352	695.5	352	694.9	0	0	-0.6	295	694.9	300.5	695.4	6	2	0.6	678	705.4	634	700.9	-44	-6	-4.4
		1 port	83.9	324	692.6	350	695.3	26	8	2.7	276	692.9	303.1	695.8	27	10	2.8	700	707.6	698	707.5	-2	0	-0.1

Note:

1. For model calibration, WTP pumps and the WR fill valve in the model were turned "off" for the fire flow tests. See Section 3.0.
2. For Test 4, 1 port flow, the field hydrant is supplying 50% less than what is expected based on the balance of system flows. Additional demands maybe occurring in the system such as supply to ADM Agri-Industries at up to 42 L/s. See Section 3.0. These test results have been disregarded.
3. For Test 8, 1 port flow, it is suspected that a valve was closed during the test and hence the model residual hydrant pressure is very high. See Section 3.0. These test results have been disregarded.
4. West End Reservoir Pumphouse Elevation = 644.7 m, WTP Pumphouse Elevation = 636.25 m



Table 5.5 (following page 22) lists the hydrant flow test data obtained including static pressures, flow during 1 port tests, and residual hydrant pressure during the flowed tests. It was noted by City staff that there was higher than usual flow on the day of the hydrant tests (~50 % higher). Consequently, model demands used during the validation process only were adjusted by scaling up the existing model ADD to account for the higher flow.

The results of the validation are summarized in Table 5.6 (following page 22) and Table 5.7 below. The differences between the model and field results are reasonably good, with no consistent bias in the model error. The *Water Distribution Systems Handbook* (Mays, 2000) indicates that for planning purposes, a maximum pressure deviation of 10% between field and model values is generally satisfactory.

Table 5.7: Summary of Model Validation Pressure Error Results

Model Pressure Error Statistics	Location		
	Residual Hydrants	West End Reservoir Pumphouse	WTP
Static Pressure Error Range	-18 to 21 kPa (-3 psi)	-4 to 0 kPa (-1 to 0 psi)	-29 to -10 kPa (-4 to -1 psi)
Static Pressure Percent Error Range	-4% to 5%	-1% to 0%	-5% to -2%
Average Static Pressure Error	4 kPa (1 psi)	-2 kPa (0 psi)	-19 kPa (-3 psi)
1 Port Flow Pressure Error Range	-36 to 16 kPa (-5 to 2 psi)	2 to 28 kPa (0 to 4 psi)	-41 to -10 kPa (-6 to 1 psi)
1 Port Flow Pressure Percent Error Range	-7% to 4%	1% to 9%	-7% to 2%
Average 1 Port Flow Pressure Error	1 kPa (0 psi)	10 kPa (2 psi)	-20 kPa (3 psi)

Note:

1. Positive values indicate that the model pressure values are higher than the field values.
2. Test E has been disregarded for 1 port flow. See Table 5.6 (following page 22).

Comments on the hydrant flow test results and details of the model validation follow below:

- The WR discharge pressure was set at 345 kPa (50 psi) during the tests and the WTP pumps were locked out.
- The model validation confirmed the pipe ‘C’ values to be:
 - PVC: C = 130
 - Cast Iron C = 90
 - Asbestos Cement (AC): C = 90
 - Steel: C =100 (except main supply line from WTP has C=90)
- Tests A and B confirm that Asbestos Cement pipes have a low pipe ‘C’ value.
- Test C, as well as the rest of the tests, confirms that the WR pumps are accurately represented in the model.
- Test D (repeat of Test 4) had no flow balance issues this time and good data was obtained. This test confirms the C values for cast iron pipes.
- Test E confirms that unknown system conditions are causing lower than expected fire flows in the south east. As noted for Test 8, it is suspected that a valve was closed in the area as the residual hydrant flow pressure is about 164 kPa (24 psi) higher than the field result.

5.3.3 Hydraulic Model Development Summary

The model constructed for this Master Plan has been updated to include existing water demands and pipe systems for development as of 2014. This existing system model has been calibrated and validated using hydrant flow test data recorded by SFE Global in October 2014 and in July 2015. As a result of the calibration and validation exercise, the existing system model adequately represents current system conditions. However as previously noted, the model calibration should be reviewed with additional fire flow testing after reported system “blockages” are resolved by the City.

5.4 Lloydminster Water Distribution System Operating Philosophy

At present, the City’s WTP normally runs from 6 am to 11 pm each day. The WTP distribution pumps supply water to the City during this time as well as fill the WR from the network during periods of low demand. At night and during periods of high demand, the WR distribution pumps supply water back to the system.

The City has indicated that they wish change the operation of the system to instead distribute water from the WR only, except under emergency conditions at which time distribution from the WTP may occur. Furthermore, the WR will be supplied by a new dedicated fill line to be constructed between the WTP and WR. Details of the proposed fill line and its operation are discussed in Section 6.3.

The WR distribution pumps are currently set to supply at a pressure of about 305 kPa (44 psi) using variable speed pumps. This is equivalent to a hydraulic grade line (HGL) of 696 m, compared to the HGL of 704 m at the Water Treatment Plant. In order to continue to supply adequate pressures to the City during peak demand periods, the HGL at the WR will need to be raised to a similar level. As a result, it is recommended that the WR variable speed pump distribution pressure setting be raised to 375 kPa (54 psi, 703 m HGL) when the system is switched over to distributing primarily from the WR.

All existing and future system assessments and upgrading recommendations described in this report have been made on the basis of raising the WR distribution pressure to 375 kPa and supplying all demands from the reservoir under normal conditions. Water distribution from the WTP may occur only under emergency conditions, including providing additional fire flows when necessary.

The system currently operates as a single pressure zone with no pressure reducing valves or booster stations. The topography of Lloydminster is relatively flat (Figure 1.1), and the ground slopes gently from the southwest (about 664 m) to northeast (about 635 m) with a relief of about 30 m. A single pressure zone can adequately operate under such conditions.

The operation of the Lloydminster water distribution (hydraulic grade lines (HGL) and other pertinent elevations) are shown diagrammatically on Figure 5.2.

5.5 Hydraulic Analysis of the Existing System

Using the calibrated and validated model, the existing system was assessed to determine the ability of the system to meet current demands and provide required fire flows. The assessment of the existing system was performed on the basis that under normal conditions, all water is to be distributed from the WR only. The WTP pumps would only supply the distribution system in the case of an emergency such as a large fire.

The existing system was analyzed to determine available pressures (or fire flows) for four demand scenarios:

1. Average Day Demand (ADD)
2. Maximum Day Demand (MDD)
3. Peak Hour Demand (PHD)

Table 5.5: Additional Hydrant Flow Test Field Data

Hydrant Test	Pressure Zone	Date	Time of Test	Test Type	WTP Pump Operation	WR Pumphouse Operation	Flow Hydrant		Residual Hydrant		WR Pumphouse Pressure		WTP Pressure	
							Flow (L/s)	Pressure (kPa)	HGL (m)	Pressure (kPa)	HGL (m)	Pressure (kPa)	HGL (m)	Pressure (kPa)
A	Main	July 9, 2015	1:38 PM to 1:46 PM	Static	Pumps locked out	VSP-1 & DP-4 ON	0	503	694.6	344	699.9	596	697.0	
				1 port			103	400	684.0	316	697.0	519	689.2	
B	Main	July 9, 2015	2:18 PM to 2:25 PM	Static	Pumps locked out	VSP-1 & DP-4 ON	0	572	698.2	346	700.1	621	699.6	
				1 port			114	510	691.8	338	699.3	567	694.0	
C	Main	July 9, 2015	2:38 PM to 2:51 PM	Static	Pumps locked out	VSP-1 & DP-4 ON	0	365	697.0	347	700.2	610	698.4	
				1 port			92	331	693.5	340	699.5	590	696.4	
D	Main	July 9, 2015	1:51 PM to 1:57 PM	Static	Pumps locked out	VSP-1 & DP-4 ON	0	510	697.7	348	700.3	620	699.5	
				1 port			39	290	675.2	342	699.7	606	698.0	
E	Main	July 9, 2015	11:22 AM to 11:26 AM	Static	Pumps locked out	VSP-1 & DP-4 ON	0	414	695.3	345	700.0	617	699.1	
				1 port			79	234	677.0	350	700.5	546	691.9	

Notes:

1. At the West End Reservoir (WR), the following pump operation occurred: pump VSP-1 VFD ON, DP-4 Constant Speed ON
2. The WR distribution set point was at 345 kPa
3. The pumps were locked out during the tests at the WTP
4. West End Reservoir Pumphouse Elevation = 644.7 m, WTP Pumphouse Elevation = 636.25 m

Table 5.6: Validated Model Comparison with Hydrant Flow Test Results

Hydrant Test	Pressure Zone	Test Type	Flow Hydrant	Residual Hydrant							WR Pumphouse Pressure						WTP Pressure							
			Flow (L/s)	Field P (kPa)	Field HGL (m)	Model P (kPa)	Model HGL (m)	Model Error (kPa)	Model Error (%)	Model Error (m)	Field P (kPa)	Field HGL (m)	Model P (kPa)	Model HGL (m)	Model Error (kPa)	Model Error (%)	Model Error (m)	Field P (kPa)	Field HGL (m)	Model P (kPa)	Model HGL (m)	Model Error (kPa)	Model Error (%)	Model Error (m)
A	Main	Static	0	503	694.6	517	696.1	14	3	1.5	344	699.9	344.0	699.9	0	0	0.0	596	697.0	586	695.9	-10	-2	-1.1
		1 port	103	400	684.0	416	685.8	16	4	1.8	316	697.0	343.8	699.8	28	9	2.8	519	689.2	510	688.2	-10	-2	-1.0
B	Main	Static	0	572	698.2	565	697.5	-7	-1	-0.6	346	700.1	344.0	699.9	-2	-1	-0.2	621	699.6	600	697.4	-21	-3	-2.2
		1 port	114	510	691.8	475	688.3	-36	-7	-3.5	338	699.3	343.8	699.8	6	2	0.6	567	694.0	544	691.7	-23	-4	-2.4
C	Main	Static	0	365	697.0	377	698.0	12	3	1.1	347	700.2	344.0	699.9	-3	-1	-0.3	610	698.4	582	695.5	-29	-5	-2.9
		1 port	92	331	693.5	343	694.7	12	4	1.3	340	699.5	343.8	699.8	4	1	0.4	590	696.4	586	695.9	-4	-1	-0.4
D	Main	Static	0	510	697.7	492	696.0	-18	-4	-1.7	348	700.3	344.0	699.9	-4	-1	-0.4	620	699.5	604	697.8	-16	-3	-1.6
		1 port	39	290	675.2	303	676.7	14	5	1.5	342	699.7	344.0	699.9	2	1	0.2	606	698.0	565	693.8	-41	-7	-4.2
E	Main	Static	0	414	695.3	434	697.4	21	5	2.1	345	700.0	344.0	699.9	-1	0	-0.1	617	699.1	601	697.5	-16	-3	-1.7
		1 port	79	234	677.0	398	693.8	164	70	16.8	350	700.5	343.9	699.8	-6	-2	-0.6	546	691.9	541	691.4	-5	-1	-0.5

Notes:

1. For model validation, the WR pumps were on and the WTP pumps were off
2. The WR distribution set point was at 345 kPa
3. For Test E, 1 port flow, it is suspected that a valve was closed during the test and hence the model residual hydrant pressure is higher than the field value.
4. West End Reservoir Pumphouse Elevation = 644.7 m, WTP Pumphouse Elevation = 636.25 m



4. Available Fire Flow at each junction during Maximum Day Demand (MDD+FF)
- With WR pumps ON only
 - With both WR and WTP pumps ON

A dedicated fill line to the West End Reservoir is planned, and its sizing is included in the scope of this study. Therefore, a scenario examining off-peak reservoir filling from the distribution grid has not been assessed.

Table 5.8 shows the operation of the pumps during the various demand scenarios.

Table 5.8: Model Pump Setting Summary

Pump Name	Location	Pump Type	Variable Speed Set Point HGL (m)	Model Scenario			
				Existing System			
				ADD	MDD	MDD+FF	PHD
VSP1	West End Reservoir	Variable Speed	702.93	ON	ON	ON	ON
VSP2	West End Reservoir	Variable Speed	702.93	ON	ON	ON	ON
DP3	West End Reservoir	Constant Speed	--	OFF	ON	ON	ON
DP4	West End Reservoir	Constant Speed	--	OFF	OFF	ON	ON
PWP 101 ²	WTP	Constant Speed	--	OFF	OFF	OFF/ON	OFF
PWP 103 ²	WTP	Variable Speed	703.53	OFF	OFF	OFF/ON	OFF

Note:

1. All flow to be supplied by the WR only unless other noted
2. One MDD+FF simulation has WTP pumps turned on during fire flow simulation in order to improve the fire flow conditions.

5.5.1 Average Day Demand Condition Analysis

The system was simulated under ADD conditions to analyze pressures throughout the City. Two pumps are required to run at the WR to meet average day demands.

The results of this analysis are shown on Figure 5.3. During ADD, system pressures should be no higher than 700 kPa (102 psi), and generally between 550 kPa and 350 kPa (80 psi and 51 psi), although pressures as low as 273 kPa (40 psi) may be acceptable provided peak hour pressures can still be met. The model results indicate that all areas of the existing system meet these criteria, with the highest pressure (643 kPa, 93 psi) occurring in the northeast industrial area near 37 Avenue and 47 Street at a ground elevation of about 636 m. The lowest pressure of 367 kPa (53 psi) occurs in the central-southwest residential area (Parkview Estates) west of 67 Avenue along 35 Street at a ground elevation of about 665 m.

5.5.2 Maximum Day Demand Condition Analysis

The system was analyzed under MDD conditions to determine the system pressures. Three pumps are required to run at the WR to meet maximum day demands.

The results of this analysis are shown on Figure 5.4. The highest pressure in the system under MDD conditions is 613 kPa (89 psi) at 37 Avenue and 47 Street in the northeast, while the lowest pressure is 353 kPa (51 psi) in the northwest industrial area south of 56 Street, along 70 Avenue (ground elevation of 663 m). System pressures should be no higher than 700 kPa (102 psi) and no less than 273 kPa (40 psi) and as such, pressures are adequate during MDD conditions.

5.5.3 Peak Hour Demand Condition Analysis

The system was analyzed under PHD to determine the minimum expected system pressures under non-emergency conditions. Four pumps are required to run at the WR to meet peak hour demands.

The results of this analysis are shown on Figure 5.5. Under PHD, system pressure should be no less than 273 kPa (40 psi) and all areas of the City currently meet this requirement. The highest pressure (567 kPa, 82 psi) occurs at 37 Avenue and 47 Street in the northeast, while the lowest pressure is 308 kPa (45 psi) in the northwest industrial area south of 56 Street, along 70 Avenue.

Pipe velocities for the existing system are shown on Figure 5.6. The majority of the pipes within the existing system have a velocity of less than 0.50 m/s. There are several pipes within the system that have a velocity between 1.0 m/s and 2.0 m/s.

5.5.4 MDD Plus Fire Flow Analysis

The fire flow requirement at any location is determined based upon the adjacent land uses and the fire flow requirement standards outlined in Section 4.6. Fire flow requirements in the City vary between 100 L/s (for single family residential) and 225 L/s (for industrial, institutional and some commercial and multi-family residential). The City's existing MDD is 253 L/s and under fire flow conditions total flows of between 353 L/s and 478 L/s would need to be supplied.

The available fire flow at each junction in the system (while maintaining a minimum system pressure of 150 kPa) was simulated using the model. Note that no velocity constraint was used in the simulation for the existing system because the calibrated model will supply as much fire flow as is available regardless of an arbitrary standard. Two scenarios were considered – the first with only the WR pumps supplying the flow to the system, and the second with the WTP pumps on as well. Details of these scenarios are described below.

With WR pumps only

Because the City would like to distribute water primarily from the WR, a fire flow simulation was conducted to determine if fire flow requirements would met with only the WR pumps operating (four pumps on). The combined design capacity of the four WR pumps is approximately 400 L/s, compared to the required demands of between 353 L/s and 478 L/s under MDD plus fire flow conditions. These flows can be supplied from the WR alone however the distribution pressure will decrease to about 323 kPa (HGL 698 m) in order to meet the required pumping rate. The model results of this analysis are shown on Figure 5.7 (Fire Flow Contours) and Figure 5.8 (Locations Meeting Fire Flow Requirements).

With only the WR pumps operating, most of the central and northeast areas of the City do not meet fire flow requirements even though ground elevations are generally lower in these areas (resulting in higher pressures under normal conditions). These areas consist of older commercial and industrial developments with high fire flow requirements (up to 225 L/s) and small diameter mains often made of cast iron. Furthermore, transmission from the WR to these areas is mainly via a few 300 mm and 250 mm mains, with a 350 mm main immediately downstream from the WR, so higher system head losses will occur.

Newer areas in the southwest generally do meet requirements; fire flow requirements are met in single family residential areas (100 L/s) although multi-family and institutional fire flows (150 to 225 L/s) may be lacking. Though ground elevations are higher in these areas, they are directly fed by a 500 mm main from



the WR and are serviced by smooth-walled (PVC) pipes sized according to current standards; therefore, system head losses will be minimal. Consequently, if adequate distribution pressures are available at the required flow then fire flows will improve.

With WR pumps and WTP pumps

In order to improve fire flow within the system, the WTP pumps were turned on during the fire flow analysis as indicated in Table 5.8. The combined pumping capacity of the WR and WTP is approximately 780 L/s at an HGL of about 703 m, which is more than adequate to meet MDD and supply fire flows of 225 L/s provided network pipe sizes and looping is adequate. The model results of this analysis are shown on Figure 5.9 (Fire Flow Contours) and Figure 5.10 (Locations Meeting Fire Flow Requirements).

With both the WTP and WR pumps operating, fire flows are improved however deficiencies are still present where the pipe network is old and undersized, particularly in the downtown core and north industrial areas. Fire flows of up to 225 L/s are required in these areas. Upgrades to the distribution system network can increase these fire flows to within requirements as pumping capacity is adequate.

Fire flow model results for the existing analyses are provided in tabular form (with key plan) in Appendix C.

5.6 Existing System Upgrading Recommendations

As peak hour pressures are met within the City provided the WR distribution pressure set point is raised to 375 kPa (703 m HGL), no upgrades are required to meet peak hour demand. Average day demand pressures are within normal ranges as well, so no new pressure zones are required for existing conditions.

Upgrades have been considered for areas not meeting the required fire flows. Figure 5.11 identifies the proposed upgrades; at the request of the City, upgrades have been included for all deficient areas including those that are within 10% of required fire flows. Each Upgrade Number listed below in Table 5.9 is shown on Figure 5.11, and locations of the pipe upgrades are also highlighted in bold. Each upgrade is also described in Table 5.9 (following page 26). Where feasible, old cast iron pipe was targeted for replacement with the dual purpose of improving fire flows to meet requirements as well as replacing pipes expected to be in poor condition.

Upgrades were prioritized based on a prioritization matrix developed in conjunction with City staff; this matrix is provided in Table 5.10 below. This prioritization matrix takes into account the relative hydraulic benefit, size of area benefitted, number of historical breaks, existing pipe diameters and material, and land use for each proposed upgrade. To prioritize the upgrades, the total weighted average (based on the pipe upgrade length) was used. The upgrades listed in Table 5.9 (following page 26) are in order of priority. In addition, there is a “sequencing of upgrades” column in Table 5.9 (following page 26) that notes if any upgrade will impact another upgrade to the extent that one must be done before the other.

Table 5.10: Existing System Hydraulic Upgrade Prioritization Matrix

Criteria	Max Points	Description
Relative hydraulic benefit	30	FF before upgrade is ___% of Standard: <50% - 30 pts; 50-70% - 20 pts; 70%-90% - 10 pts; 90%-100% - 5 pts (if upgrade is for a larger area consider worst case land use requirement)
Size of area benefitted	20	Neighbourhood wide/large area - 20; local benefit (one or two blocks) - 5
Historical breaks	15	Number of historical breaks (on pipes to be upgraded) x 3

Criteria	Max Points	Description
Existing pipe diameters	10	150 mm - 10; 200 mm - 5; other - 1
Existing pipe material	15	Cast Iron - 15; AC - 5; PVC and other - 1
Land Use/Importance	10	Land use: Institutional - 10; Commercial - 8; Industrial - 7; Multifamily - 5; SF Residential - 1
Total	100	

The model was simulated with all these upgrades in place, and the results are shown on Figure 5.12 (Fire Flow Contours) and Figure 5.13 (Locations Meeting Fire Flow Requirements). For the upgrade scenario both the WR pumps and WTP pumps were turned on. Upon upgrading, fire flow requirements would be met in most locations. Note that there are some areas within the system that were not upgraded for the following reasons:

- Upgrades were not considered for pipes that are on private property (i.e. Lakeland College and the Mobile Park). Adequate fire flows for the land use are available in the adjacent public mains, therefore on-site pipe upgrades by the landowners could improve private fire flows.
- For the area along 43 Street from 49 Avenue to 48 Avenue, there are existing 150 mm cast iron and 250 mm asbestos cement mains. In order to meet fire flows here, it is recommended that hydrants along this stretch be connected to the 250mm main rather than the cast iron main, however the cast iron main can be replaced as an alternative.
- For areas which are still developing or have adjacent undeveloped lands, upgrades were generally not considered as future looping will likely improve the fire flows. This will be confirmed as part of the next steps of the project.

5.7 Existing System Upgrading Probable Costs

Cost estimates (refer to Table 5.11, following page 26) have been provided for the existing upgrades. The costs estimates are in 2015 dollars and include engineering (15%) and contingency (30%) but does not include GST. Note that these cost estimates are conceptual, based on a conceptual level of analysis and are subject to review at detail design.

Table 5.9: Proposed Existing Water Distribution System Upgrades to Meet Fire Flow Requirements

Priority No.	Sequencing of Upgrades	Prioritization Criteria						Total Points	Pipe Upgrade Length (m)	Total Weighted Average Points	Total Cost (\$)	Model From Node	Model To Node	Existing Size/ Material	Upgrade Size/ Material	Address	Target Fire Flows (L/s)	Fire Flows Before Upgrade (L/s)	Fire Flows After Upgrade (L/s)	Comments
		Relative Hydraulic Benefit (Max 30)	Size of Area Benefitted (Max 20)	Historical Breaks (Max 15)	Existing Pipe Diameters (Max 10)	Existing Pipe Material (Max 15)	Land Use/ Importance (Max 10)													
1		20	20	15	10	15	8	88	593	84	\$1,715,650	J-16	J-4039	150 mm, CI	250 mm, PVC	49 Ave from 50 St to 44 St	225	152 to 218	300	Upgrade - to improve fire flow at several locations east of 49 Ave for highway commercial, institutional, multi-family and single family fire flows(see also Upgrade No. 11 for further improvements)
		10	5	9	10	15	10	59	103			J-292	J-2107	150 mm, CI	250 mm, PVC	49 Ave from 41 St to 40 St	100 to 225	191 to 229	270 to 275	
2		30	20	0	10	5	8	73	645	73	\$1,589,930	J-36	J-39	150 - 200 mm, AC	250 mm, PVC	50 Ave from 18 St to 12 St	225	96 to 300	245 to 300	Local Upgrade - replace existing 150-200 mm AC pipe to improve fire flow in the area to the east of 50 Ave.
3		5	5	6	10	15	5	46	175	71	\$4,950,850	J-1524	J-2369	150 mm, CI	200 mm, PVC	46 St, from 52 Ave along to 51 Ave	100 to 185	180 to 300	298 to 300	Local Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		30	5	21	10	15	8	89	523			J-286	J-58	150 mm, CI	200 mm, PVC	47 St, from 50 Ave to 53 Ave	100 to 225	121 to 300	269 to 300	Local Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		5	5	3	10	15	8	46	177			J-1236	J-2371	150 mm, CI	200 mm, PVC	48 St, from 53 Ave to 52 Ave	225	205	290	Local Upgrade - this would replace a section of CI pipe and help improve fire flow at node J-1240
		20	5	9	10	15	8	67	762			J-271	J-62	150 mm, CI	200 mm, PVC	50 St, from 51 Ave to 55 Ave	185 to 225	127 to 300	300	Local Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		20	5	15	10	15	8	73	670			J-2366	J-2353	150 mm, CI	200 mm, PVC	51 St, from 51 Ave along 51 St to 56 Ave	225	140 to 300	254 to 300	Local Upgrade - this would replace a section of CI pipe and help improve fire flow here.
4		20	5	18	10	15	8	76	619	67	\$3,057,420	J-282	J-2115	150 mm, CI	250 mm, PVC	50 Ave, from 56B St to 54 St	225	141 to 300	300	Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		10	5	6	10	15	8	54	153			J-1256	J-2413	150 mm, CI	200 mm, PVC	50 Ave west along 56 A St	185 to 225	149 to 204	300	Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		10	5	0	10	15	10	50	174			J-2414	J-283	150 mm, CI	300 mm, PVC	55 St, from 51 Ave to 52 Ave	225	175 to 300	300	Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		20	5	9	10	15	8	67	342			J-1462	J-1260	150 mm, CI	200 mm, PVC	54A St, from 50 Ave to 51 Ave	225	143 to 300	300	Upgrade - this would replace a section of CI pipe and help improve fire flow here.
5		10	5	18	10	15	8	66	610	65	\$1,533,590	J-281	J-2139	150 mm, CI	250 mm, PVC	49 Ave, from 56B St to 54 St	185 to 225	133 to 300	300	Local Upgrade as part of the 49 Ave future upgrades - to meet Industrial, multi-family and single family fire flow
		10	5	0	10	5	8	38	16			J-2139	J-2131	150 mm, AC	150 mm, PVC	54 St, from 49 Ave to 48 Ave	100 to 225	81 to 300	132 to 300	Local Upgrade as part of the 49 Ave future upgrades - to meet Industrial, multi-family and single family fire flow
6		30	5	0	10	5	8	58	591	58	\$1,848,760	J-3806	J-13, J-3807	150 mm, AC	250 mm, PVC	50 Ave, from 60 St to 57 St	225	84 to 183	244 to 300	Upgrade - existing pipe is 150 mm AC and this helps improve fire flow at node J-3805.
		30	5	0	10	5	10	60	159			J-52	J-3808	150 mm, AC	250 mm, PVC	52 Ave, West on 57 St	225	87	300	Local Upgrade - replace existing 150 mm AC line to improve fire flow here.
7		30	5	0	10	5	8	58	823	See below for Total Cost		J-27	J-28	150 mm, AC	250 mm, PVC	50 Ave, from 36 St to 29 St	225	97 to 300	300	Upgrade existing 150 mm AC to help improve fire flow for HWY commercial
		10	20	0	0	0	8	38	157			J-28	J-3881	N/A	250 mm, PVC	Crosses 50 Ave at 29 St	225	186 to 300	300	Upgrade - new 250 mm PVC to improve looping and increase fire flow for HWY commercial and local area to the east

Table 5.9: Proposed Existing Water Distribution System Upgrades to Meet Fire Flow Requirements

Priority No.	Sequencing of Upgrades	Prioritization Criteria						Total Points	Pipe Upgrade Length (m)	Total Weighted Average Points	Total Cost (\$)	Model From Node	Model To Node	Existing Size/ Material	Upgrade Size/ Material	Address	Target Fire Flows (L/s)	Fire Flows Before Upgrade (L/s)	Fire Flows After Upgrade (L/s)	Comments
		Relative Hydraulic Benefit (Max 30)	Size of Area Benefitted (Max 20)	Historical Breaks (Max 15)	Existing Pipe Diameters (Max 10)	Existing Pipe Material (Max 15)	Land Use/ Importance (Max 10)													
7		30	5	0	0	0	8	43	45	55	\$3,575,750	J-2319	J-2098	N/A	250 mm, PVC	Crosses 50 Ave at about 32 St	225	44 to 91	300	Upgrade - new 250 mm PVC to improve looping and increase fire flow for HWY commercial
		30	5	3	10	5	8	61	124			J-2096	J-2097	150 mm, AC	250 mm, PVC	From 36 St along 50 Ave east side to about 35 St	225	85 to 297	300	Upgrade - the existing 150 mm AC to help improve fire flow for HWY commercial.
		30	20	0	0	0	8	58	124			J-2320	J-104	N/A	250 mm, PVC	31 St, from 50 Ave to 51 Ave	225	97 to 271	300	Upgrade - new 250 mm PVC to improve fire flow for the local area
		20	5	0	10	5	10	50	204			J-99	J-1218	150 mm, AC	200 mm, PVC	52 Ave, from 35 St to 34 St	225	158	245	Local Upgrade - replace existing 150 mm AC pipe to improve fire flow to meet institutional & Single family fire flow
8		20	5	0	10	5	8	48	209	48	\$890,740	J-24	J-2112	150 mm, AC	250 mm, PVC	50 Ave, from 42 St to 40 St	225	147 to 300	300	Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial.
		20	5	0	10	5	8	48	175			J-2109	J-2110	150 mm, AC	200 mm, PVC	West on 41 St	225	129	270	Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial.
9		20	5	0	10	5	8	48	331	48	\$1,491,490	J-309	J-311	150 mm, AC	200 mm, PVC	41 St, from 59 Ave to 57 Ave	225	136 to 300	300	Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial.
		20	5	0	10	5	8	48	364			J-1506	J-1508	150 mm, AC	200 mm, PVC	43 St, from 56 Ave to 57 Ave	225	126 to 300	300	Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial.
10		20	5	0	10	5	7	47	215	47	\$529,980	J-3715	J-3643	200 mm, AC	250mm, PVC	62 Ave west on 48 St	225	115 to 300	242 to 300	Local Upgrade - replaced existing 200 mm AC pipe to improve fire flow for Industrial fire flow.
11	Requires Upgrade No. 1 first	30	5	15	10	15	8	83	460	47	\$5,324,140	J-2114	J-2113	150 mm, CI	200 mm, PVC	48 St, from 49 Ave to 47 Ave	225	48 to 152	300	Local Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		30	5	0	0	0	8	43	196			J-2373	J-2375	N/A	250 mm, PVC	48 Ave, from 49 St to 47 St	185 to 225	65 to 126	300	Local Upgrade - this is a new pipe proposed here that runs north-south and improves looping.
		20	5	0	0	0	8	33	93			J-2382	J-2383	N/A	250 mm, PVC	45 St, from 49 Ave to 48 Ave	225	129	243	Local Upgrade - new 250 mm PVC pipe to go north south to meet the required FF
		20	5	0	0	0	10	35	101			J-2377	J-2378	N/A	250 mm, PVC	46 Ave, from 50 St to 49 St	225	122	300	Local Upgrade - this is a new pipe proposed here that runs north-south and improves looping.
		20	5	3	10	5	5	48	82			J-1248	J-3809	150 mm, AC	200 mm, PVC	45 Ave east along 49 St	185	125 to 300	292 to 300	Local Upgrade - existing pipe is 150 mm AC.
		20	5	0	10	5	5	45	94			J-1250	J-3812	150 mm, AC	200 mm, PVC	45 Ave east along 46 St	185	115 to 300	276 to 300	Local Upgrade - existing pipe is 150 mm AC.
		20	5	0	5	1	8	39	576			J-137	J-138	200 mm, PVC	300 mm, PVC	45 Ave east along 45 St	185 to 225	132 to 300	296 to 300	Local Upgrade - existing pipe is 200 mm PVC, but would need to upsize to 300 mm PVC in order to meet required fire flow for industrial area.

Table 5.9: Proposed Existing Water Distribution System Upgrades to Meet Fire Flow Requirements

Priority No.	Sequencing of Upgrades	Prioritization Criteria						Total Points	Pipe Upgrade Length (m)	Total Weighted Average Points	Total Cost (\$)	Model From Node	Model To Node	Existing Size/ Material	Upgrade Size/ Material	Address	Target Fire Flows (L/s)	Fire Flows Before Upgrade (L/s)	Fire Flows After Upgrade (L/s)	Comments
		Relative Hydraulic Benefit (Max 30)	Size of Area Benefitted (Max 20)	Historical Breaks (Max 15)	Existing Pipe Diameters (Max 10)	Existing Pipe Material (Max 15)	Land Use/ Importance (Max 10)													
11		5	5	0	5	5	7	27	213	See above for Total Cost	J-127	J-182	200 mm, AC	250 mm, PVC	52 St, from 45 Ave to about 43 Ave	225	214 to 300	300	Local Upgrade - the existing 200 mm AC main to 250 mm PVC main helps improve flows along 52 St.	
		30	5	0	0	0	10	45	191		J-2321	J-2323	N/A	250 mm, PVC	47 Ave, from 49 St to 47 St	225	107 to 108	300	Local Upgrade - propose to install new pipe here to provide looping to improve fire flow for industrial area	
		20	5	0	0	0	5	30	91		J-2324	J-2325	N/A	250 mm, PVC	47 Ave, from 46 St to 45 St	185	108	229	Local Upgrade - new 250 mm PVC pipe to go north south to meet the required FF	
		20	5	0	0	0	5	30	103		J-2379	J-2385	N/A	250 mm, PVC	47 Ave, from 47 St to 46 St	185	118 to 145	300	Local Upgrade - new 250 mm PVC pipe to go north south to meet the required FF	
12		5	5	0	10	5	5	30	102	42	\$440,290	J-302	J-300	150 mm, AC	250 mm, PVC	48 Ave, from 27 St to 26 St	185	176	263	Local Upgrade - existing pipe is 150 mm AC and this helps meet the required fire flow in the area.
		30	5	0	10	5	5	55	88			J-1224	J-3737	150 mm, AC	200 mm, PVC	27 St, south on 47A Ave	185	91 to 175	165 to 201	Local Upgrade - existing pipe is 150 mm AC and this helps improve fire flow in the area.
13		5	5	3	10	1	10	34	291	39	\$1,198,850	J-1268	J-1228	150 mm, PVC	200 mm, PVC	57 Ave, from 51 St to 48 St	225	223 to 300	286 to 300	Local Upgrade this would replace a section of 150 mm CI pipe and help meet the required fire flow here.
		20	5	0	10	1	10	46	233			J-1268	J-3815	150 mm, PVC	250 mm PVC	57 Ave, west on 51 St	225	133 to 223	300	Local Upgrade - to meet the fire flow requirements for the institutional area
14		10	5	0	10	5	8	38	422	38	\$1,040,230	J-77	J-76	150 mm, AC	250 mm, PVC	44 St, from 66 Ave to 62 Ave	225	173	300	Local Upgrade - to meet Highway Commercial fire flow
15		10	5	0	10	5	5	35	98	35	\$210,320	J-29	J-298	150 mm, AC	200 mm, PVC	32 St, from 49 Ave to 48 Ave	185	164 to 221	241 to 267	Local upgrade to meet required FF
16		20	5	0	0	0	7	32	296	32	\$2,004,050	J-1106	J-65	N/A	250 mm, PVC	62 Ave along 56 St to 59 Ave	225	136	300	Local Upgrade - propose to install new pipe here to provide looping to improve fire flow for industrial area here.
		20	5	0	0	0	7	32	517			J-1108	J-170	N/A	250 mm, PVC	59 Ave north to 62 St	225	118 to 300	300	Local Upgrade - propose to install new pipe here to provide looping to improve fire flow for industrial area here.
17		10	5	0	5	5	7	32	490	32	\$1,207,850	J-42	J-3144	200 mm, AC	250 mm, PVC	West on 65 St and north on 52 Ave	225	163 to 265	226 to 279	Local Upgrade - replace existing 200 mm AC pipe with 250 mm PVC to meet the required fire flow for industrial area.
18		10	5	0	5	5	7	32	232	31	\$873,950	J-47	J-2416	200 mm, AC	250 mm, PVC	62 St, south on 52 Ave	225	216 to 300	300	Local upgrade to meet required FF
		10	5	0	1	5	7	28	112			J-49	J-50	250 mm, AC	300 mm, PVC	53 Ave from 60 St to 59 St	225	195 to 228	233 to 248	City can consider the local upgrade here in order to meet required FF at node J-51. This location is fairly close to the WTP and given the calibrated C value for AC pipe is 90, the model may be underestimating the flows here. City may want to consider doing local fire flow testing here.
19		10	5	0	10	5	1	31	96	31	\$206,030	J-4045	J-4047	150 mm, AC	200 mm, PVC	29A St, north on the PUL between 58 Ave and 57B Ave	100	81	113	Local Upgrade - new and replace existing 150 mm AC pipe to improve fire flow to meet SF residential flow.
20		10	5	0	10	5	1	31	125	31	\$268,250	J-1494	J-3747	150 mm, AC	200 mm, PVC	46 Ave West on 35 St	100	77 to 133	123 to 136	Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow to meet low density residential fire flow.

Table 5.9: Proposed Existing Water Distribution System Upgrades to Meet Fire Flow Requirements

Priority No.	Sequencing of Upgrades	Prioritization Criteria						Total Points	Pipe Upgrade Length (m)	Total Weighted Average Points	Total Cost (\$)	Model From Node	Model To Node	Existing Size/ Material	Upgrade Size/ Material	Address	Target Fire Flows (L/s)	Fire Flows Before Upgrade (L/s)	Fire Flows After Upgrade (L/s)	Comments
		Relative Hydraulic Benefit (Max 30)	Size of Area Benefitted (Max 20)	Historical Breaks (Max 15)	Existing Pipe Diameters (Max 10)	Existing Pipe Material (Max 15)	Land Use/ Importance (Max 10)													
21		20	5	0	0	0	5	30	125	30	\$69,790	J-3987	399839	N/A	300 mm, PVC	North of 36 St	100 to 185	182 to 223	243 to 300	Upgrade - new 300 mm line to residential area to meet the required fire flow for medium and single family residential.
22		5	5	0	10	5	5	30	210	28	\$776,860	J-1300	J-2392	150 mm, AC	200 mm, PVC	30 St and 55A Ave	100 to 185	98 to 186	148 to 189	Local upgrade to meet required FF
		5	5	0	10	5	1	26	152			J-2120	J-2121	150 mm, AC	200 mm, PVC	30 St , south of 55 Ave	100	96 to 140	127 to 136	Local upgrade to meet required FF
23		5	5	0	10	5	1	26	84	26	\$180,270	J-1464	J-3738	150 mm, AC	200 mm, PVC	46A Ave, along 23 St	100	93 to 184	157 to 188	Local upgrade to meet required FF
24		5	5	0	10	5	1	26	89	26	\$191,000	J-1492	J-3748	150 mm, AC	200 mm, PVC	35 St, south on 45A Ave	100	95 to 168	154 to 173	Local upgrade to meet required FF
25		0	5	0	0	0	8	13	32	13	\$78,880	J-4037	J-4034	N/A	250 mm, PVC	50 Ave south to 44 St	N/A	N/A	N/A	Local upgrade to provide looping to improve the level of service here

Notes:

1. AC = Asbestos Cement
CI = Cast Iron
FF = Fire flow
HWY = Highway
WTP = Water Treatment Plant
2. Upgrades are grouped by location - sometimes there is more than one upgrade per location and total points are calculated for each location.
3. Relative Hydraulic Benefit column - took the lower number to calculate the points. For ranges of FF, looked at where the model was deficient to figure out points.
4. Pipe length is based on the model scaled length.
5. Prioritization of upgrades are based on the highest total weighted average score for each upgrade group.
6. Total costs include engineering (15%) and contingency (30%) but does not include GST. It is the total cost of the entire upgrade group.

Table 5.11: Proposed Water Distribution System Upgrades - Cost Estimates

Priority No.	Sequencing of Upgrades	Model From node	Model To Node	Upgrade size/Material	Pipe Upgrade Length (m)	Built Up or Green Field	Address	Unit Cost (\$/m)	Extended Cost (\$)	Engineering (15%)	Contingency (30%)	Sub-Total (\$)	Total Cost (\$)	Comments
1		J-16	J-4039	250 mm, PVC	593	Built Up	49 Ave from 50 St to 44 St	\$1,700	\$1,008,100	\$151,220	\$302,430	\$1,461,750	\$1,720,000	Upgrade - to improve fire flow at several locations east of 49 Ave for highway commercial, institutional, multi-family and single family fire flows(see also Upgrade No. 11 for further improvements)
		J-292	J-2107	250 mm, PVC	103	Built Up	49 Ave from 41 St to 40 St	\$1,700	\$175,100	\$26,270	\$52,530	\$253,900		
2		J-36	J-39	250 mm, PVC	645	Built Up	50 Ave from 18 St to 12 St	\$1,700	\$1,096,500	\$164,480	\$328,950	\$1,589,930	\$1,590,000	Local Upgrade - replace existing 150 mm AC pipe to improve fire flow in the area to the east of 50 Ave.
3		J-1524	J-2369	200 mm, PVC	175	Built Up	46 St, from 52 Ave along to 51 Ave	\$1,480	\$259,000	\$38,850	\$77,700	\$375,550	\$4,950,000	Local Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		J-286	J-58	200 mm, PVC	523	Built Up	47 St, from 50 Ave to 53 Ave	\$1,480	\$774,040	\$116,110	\$232,220	\$1,122,370		Local Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		J-1236	J-2371	200 mm, PVC	177	Built Up	48 St, from 53 Ave to 52 Ave	\$1,480	\$261,960	\$39,300	\$78,590	\$379,850		Local Upgrade - this would replace a section of CI pipe and help improve fire flow at node J-1240
		J-271	J-62	200 mm, PVC	762	Built Up	50 St, from 51 Ave to 55 Ave	\$1,480	\$1,127,760	\$169,170	\$338,330	\$1,635,260		Local Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		J-2366	J-2353	200 mm, PVC	670	Built Up	51 St, from 51 Ave along 51 St to 56 Ave	\$1,480	\$991,600	\$148,740	\$297,480	\$1,437,820		Local Upgrade - this would replace a section of CI pipe and help improve fire flow here.
4		J-282	J-2115	250 mm, PVC	619	Built Up	50 Ave, from 56B St to 54 St	\$1,700	\$1,052,300	\$157,850	\$315,690	\$1,525,840	\$3,060,000	Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		J-1256	J-2413	200 mm, PVC	153	Built Up	50 Ave west along 56 A St	\$1,480	\$226,440	\$33,970	\$67,940	\$328,350		Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		J-2414	J-283	300 mm, PVC	174	Built Up	55 St, from 51 Ave to 52 Ave	\$1,860	\$323,640	\$48,550	\$97,100	\$469,290		Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		J-1462	J-1260	200 mm, PVC	342	Built Up	54A St, from 50 Ave to 51 Ave	\$1,480	\$506,160	\$75,930	\$151,850	\$733,940		Upgrade - this would replace a section of CI pipe and help improve fire flow here.
5		J-281	J-2139	250 mm, PVC	610	Built Up	49 Ave, from 56B St to 54 St	\$1,700	\$1,037,000	\$155,550	\$311,100	\$1,503,650	\$1,530,000	Local Upgrade as part of the 49 Ave future upgrades - to meet Industrial, multi-family and single family fire flow
		J-2139	J-2131	150 mm, PVC	16	Built Up	54 St, from 49 Ave to 48 Ave	\$1,290	\$20,640	\$3,100	\$6,200	\$29,940		Local Upgrade as part of the 49 Ave future upgrades - to meet Industrial, multi-family and single family fire flow
6		J-3806	J-13, J-3807	250 mm, PVC	591	Built Up	50 Ave, from 60 St to 57 St	\$1,700	\$1,004,700	\$150,710	\$301,410	\$1,456,820	\$1,850,000	Upgrade - existing pipe is 150 mm AC and this helps improve fire flow at node J-3805.
		J-52	J-3808	250 mm, PVC	159	Built Up	52 Ave, West on 57 St	\$1,700	\$270,300	\$40,550	\$81,090	\$391,940		Local Upgrade - replace existing 150 mm AC line to improve fire flow here.
7		J-27	J-28	250 mm, PVC	823	Built Up	50 Ave, from 36 St to 29 St	\$1,700	\$1,399,100	\$209,870	\$419,730	\$2,028,700	\$3,580,000	Upgrade existing 150 mm AC to help improve fire flow for HWY commercial
		J-28	J-3881	250 mm, PVC	157	Built Up	Crosses 50 Ave at 29 St	\$1,700	\$266,900	\$40,040	\$80,070	\$387,010		Upgrade - new 250 mm PVC to improve looping and increase fire flow for HWY commercial and local area to the east
		J-2319	J-2098	250 mm, PVC	45	Built Up	Crosses 50 Ave at about 32 St	\$1,700	\$76,500	\$11,480	\$22,950	\$110,930		Upgrade - new 250 mm PVC to improve looping and increase fire flow for HWY commercial
		J-2096	J-2097	250 mm, PVC	124	Built Up	From 36 St along 50 Ave east side to about 35 St	\$1,700	\$210,800	\$31,620	\$63,240	\$305,660		Upgrade - the existing 150 mm AC to help improve fire flow for HWY commercial.
		J-2320	J-104	250 mm, PVC	124	Built Up	31 St, from 50 Ave to 51 Ave	\$1,700	\$210,800	\$31,620	\$63,240	\$305,660		Upgrade - new 250 mm PVC to improve fire flow for the local area
		J-99	J-1218	200 mm, PVC	204	Built Up	52 Ave, from 35 St to 34 St	\$1,480	\$301,920	\$45,290	\$90,580	\$437,790		Local Upgrade - replace existing 150 mm AC pipe to improve fire flow to meet institutional & Single family fire flow

Table 5.11: Proposed Water Distribution System Upgrades - Cost Estimates

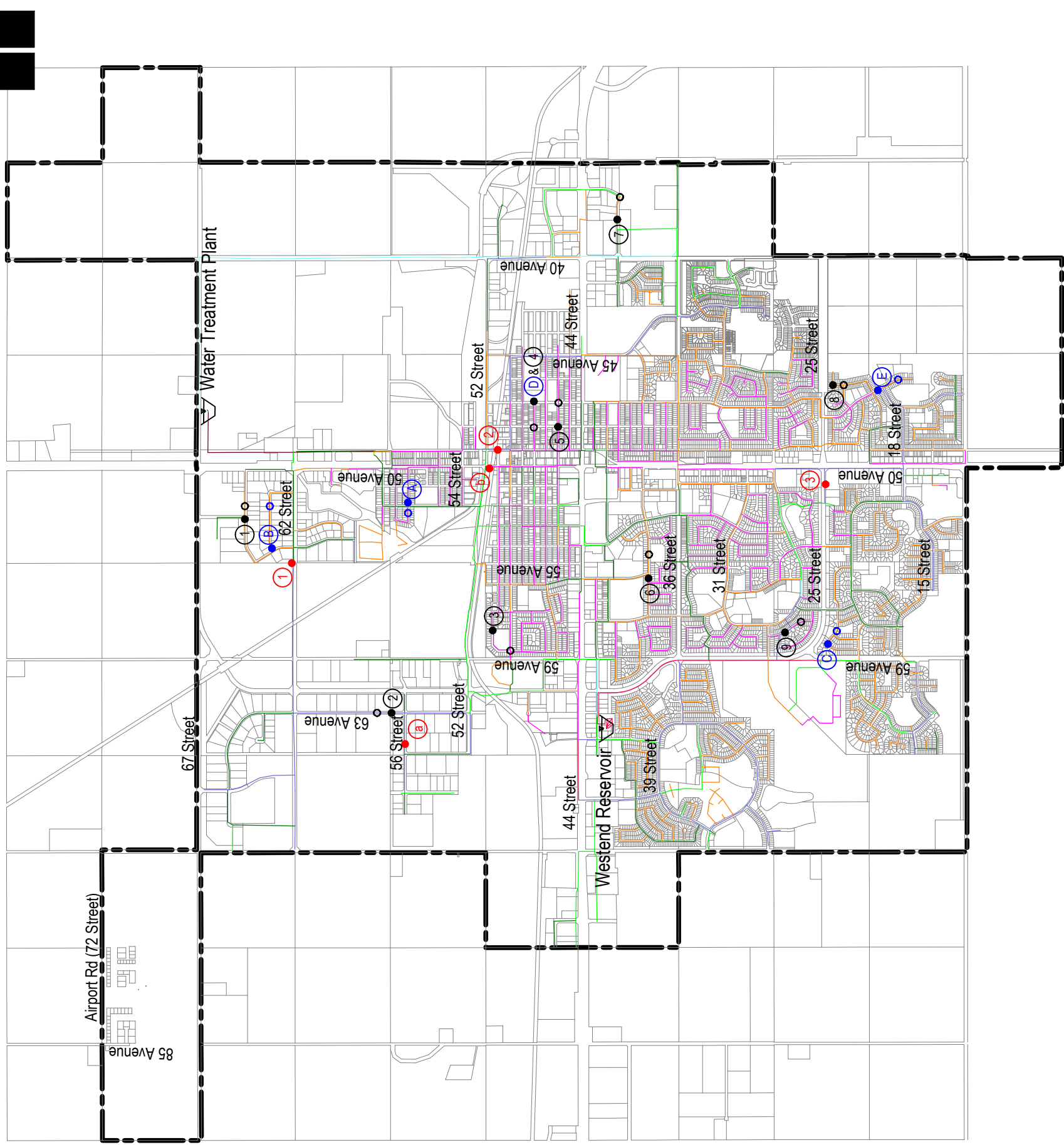
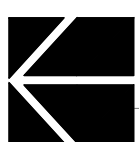
Priority No.	Sequencing of Upgrades	Model From node	Model To Node	Upgrade size/Material	Pipe Upgrade Length (m)	Built Up or Green Field	Address	Unit Cost (\$/m)	Extended Cost (\$)	Engineering (15%)	Contingency (30%)	Sub-Total (\$)	Total Cost (\$)	Comments
8		J-24	J-2112	250 mm, PVC	209	Built Up	50 Ave, from 42 St to 40 St	\$1,700	\$355,300	\$53,300	\$106,590	\$515,190	\$890,000	Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial.
		J-2109	J-2110	200 mm, PVC	175	Built Up	West on 41 St	\$1,480	\$259,000	\$38,850	\$77,700	\$375,550		Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial.
9		J-309	J-311	200 mm, PVC	331	Built Up	41 St, from 59 Ave to 57 Ave	\$1,480	\$489,880	\$73,490	\$146,970	\$710,340	\$1,490,000	Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow for HWY commercial.
		J-1506	J-1508	200 mm, PVC	364	Built Up	43 St, from 56 Ave to 57 Ave	\$1,480	\$538,720	\$80,810	\$161,620	\$781,150		Local Upgrade - replace existing 150 mm AC pipe to improve fire flow for HWY commercial.
10		J-3715	J-3643	250 mm, PVC	215	Built Up	62 Ave west on 48 St	\$1,700	\$365,500	\$54,830	\$109,650	\$529,980	\$530,000	Local Upgrade - replaced existing 200 mm AC pipe to improve fire flow for Industrial fire flow.
11	Requires Upgrade No. 1 first	J-2114	J-2113	200 mm, PVC	460	Built Up	48 St, from 49 Ave to 47 Ave	\$1,480	\$680,800	\$102,120	\$204,240	\$987,160	\$5,330,000	Local Upgrade - this would replace a section of CI pipe and help improve fire flow here.
		J-2373	J-2375	250 mm, PVC	196	Built Up	48 Ave, from 49 St to 47 St	\$1,700	\$333,200	\$49,980	\$99,960	\$483,140		Local Upgrade - this is a new pipe proposed here that runs north-south and improves looping.
		J-2382	J-2383	200 mm, PVC	93	Built Up	45 St, from 49 Ave to 48 Ave	\$1,480	\$137,640	\$20,650	\$41,300	\$199,590		Local Upgrade - new 250 mm PVC pipe to go north south to meet the required FF
		J-2377	J-2378	250 mm, PVC	101	Built Up	46 Ave, from 50 St to 49 St	\$1,700	\$171,700	\$25,760	\$51,510	\$248,970		Local Upgrade - this is a new pipe proposed here that runs north-south and improves looping.
		J-1248	J-3809	200 mm, PVC	82	Built Up	45 Ave east along 49 St	\$1,480	\$121,360	\$18,210	\$36,410	\$175,980		Local Upgrade - existing pipe is 150 mm AC.
		J-1250	J-3812	200 mm, PVC	94	Built Up	45 Ave east along 46 St	\$1,480	\$139,120	\$20,870	\$41,740	\$201,730		Local Upgrade - existing pipe is 150 mm AC.
		J-137	J-138	300 mm, PVC	576	Built Up	45 Ave east along 45 St	\$1,860	\$1,071,360	\$160,710	\$321,410	\$1,553,480		Local Upgrade - existing pipe is 200 mm PVC, but would need to upsize to 300 mm PVC in order to meet required fire flow for industrial area.
		J-127	J-182	250 mm, PVC	213	Built Up	52 St, from 45 Ave to about 43 Ave	\$1,700	\$362,100	\$54,320	\$108,630	\$525,050		Local Upgrade - the existing 200 mm AC main to 250 mm PVC main helps improve flows along 52 St.
		J-2321	J-2323	250 mm, PVC	191	Built Up	47 Ave, from 49 St to 47 St	\$1,700	\$324,700	\$48,710	\$97,410	\$470,820		Local Upgrade - propose to install new pipe here to provide looping to improve fire flow for industrial area here.
		J-2324	J-2325	250 mm, PVC	91	Built Up	47 Ave, from 46 St to 45 St	\$1,700	\$154,700	\$23,210	\$46,410	\$224,320		Local Upgrade - new 250 mm PVC pipe to go north south to meet the required FF
J-2379	J-2385	250 mm, PVC	103	Built Up	47 Ave, from 47 St to 46 St	\$1,700	\$175,100	\$26,270	\$52,530	\$253,900	Local Upgrade - new 250 mm PVC pipe to go north south to meet the required FF			
12		J-302	J-300	250 mm, PVC	102	Built Up	48 Ave, from 27 St to 26 St	\$1,700	\$173,400	\$26,010	\$52,020	\$251,430	\$440,000	Local Upgrade - existing pipe is 200 mm AC and this helps meet the required fire flow in the area.
		J-1224	J-3737	200 mm, PVC	88	Built Up	27 St, south on 47A Ave	\$1,480	\$130,240	\$19,540	\$39,080	\$188,860		Local Upgrade - existing pipe is 200 mm AC and this helps improve fire flow in the area.
13		J-1268	J-1228	200 mm, PVC	291	Built Up	57 Ave, from 51 St to 48 St	\$1,480	\$430,680	\$64,610	\$129,210	\$624,500	\$1,200,000	Local Upgrade this would replace a section of 150 mm CI pipe and help meet the required fire flow here.
		J-1268	J-3815	250 mm, PVC	233	Built Up	57 Ave, west on 51 St	\$1,700	\$396,100	\$59,420	\$118,830	\$574,350		Local Upgrade - to meet the fire flow requirements for the institutional area
14		J-77	J-76	250 mm, PVC	422	Built Up	44 St, from 66 Ave to 62 Ave	\$1,700	\$717,400	\$107,610	\$215,220	\$1,040,230	\$1,040,000	Local Upgrade - to meet Highway Commercial fire flow
15		J-29	J-298	200 mm, PVC	98	Built Up	32 St, from 49 Ave to 48 Ave	\$1,480	\$145,040	\$21,760	\$43,520	\$210,320	\$210,000	Local upgrade to meet required FF
16		J-1106	J-65	250 mm, PVC	296	Built Up	62 Ave along 56 St to 59 Ave	\$1,700	\$503,200	\$75,480	\$150,960	\$729,640	\$2,000,000	Local Upgrade - propose to install new pipe here to provide looping to improve fire flow for industrial area here.
		J-1108	J-170	250 mm, PVC	517	Built Up	59 Ave north to 62 St	\$1,700	\$878,900	\$131,840	\$263,670	\$1,274,410		Local Upgrade - propose to install new pipe here to provide looping to improve fire flow for industrial area here.
17		J-42	J-3144	250 mm, PVC	490	Built Up	West on 65 St and north on 52 Ave	\$1,700	\$833,000	\$124,950	\$249,900	\$1,207,850	\$1,210,000	Local Upgrade - replace existing 200 mm AC pipe with 250 mm PVC to meet the required fire flow for industrial area.

Table 5.11: Proposed Water Distribution System Upgrades - Cost Estimates

Priority No.	Sequencing of Upgrades	Model From node	Model To Node	Upgrade size/Material	Pipe Upgrade Length (m)	Built Up or Green Field	Address	Unit Cost (\$/m)	Extended Cost (\$)	Engineering (15%)	Contingency (30%)	Sub-Total (\$)	Total Cost (\$)	Comments
18		J-47	J-2416	250 mm, PVC	232	Built Up	62 St, south on 52 Ave	\$1,700	\$394,400	\$59,160	\$118,320	\$571,880	\$870,000	Local upgrade to meet required FF
		J-49	J-50	300 mm, PVC	112	Built Up	53 Ave from 60 St to 59 St	\$1,860	\$208,320	\$31,250	\$62,500	\$302,070		City can consider the local upgrade here in order to meet required FF at node J-51. This location is fairly close to the WTP and given the calibrated C value for AC pipe is 90, the model may be underestimating the flows here. City may want to consider doing local fire flow testing here.
19		J-4045	J-4047	200 mm, PVC	96	Built Up	29A St, north on the PUL between 58 Ave and 57B Ave	\$1,480	\$142,080	\$21,320	\$42,630	\$206,030	\$210,000	Local Upgrade - new and replace existing 150 mm AC pipe to improve fire flow to meet SF residential flow.
20		J-1494	J-3747	200 mm, PVC	125	Built Up	46 Ave West on 35 St	\$1,480	\$185,000	\$27,750	\$55,500	\$268,250	\$270,000	Local Upgrade - replaced existing 150 mm AC pipe to improve fire flow to meet low density residential fire flow.
21		J-3987	399839	300 mm, PVC	125	Green Field	North of 36 St	\$600	\$75,000	\$11,250	\$22,500	\$108,750	\$110,000	Upgrade - new 300 mm line to residential area to meet the required fire flow for medium and single family residential.
22		J-1300	J-2392	200 mm, PVC	210	Built Up	30 St and 55A Ave	\$1,480	\$310,800	\$46,620	\$93,240	\$450,660	\$780,000	Local upgrade to meet required FF
		J-2120	J-2121	200 mm, PVC	152	Built Up	30 St, south of 55 Ave	\$1,480	\$224,960	\$33,750	\$67,490	\$326,200		Local upgrade to meet required FF
23		J-1464	J-3738	200 mm, PVC	84	Built Up	46A Ave, along 23 St	\$1,480	\$124,320	\$18,650	\$37,300	\$180,270	\$180,000	Local upgrade to meet required FF
24		J-1492	J-3748	200 mm, PVC	89	Built Up	35 St, south on 45A Ave	\$1,480	\$131,720	\$19,760	\$39,520	\$191,000	\$190,000	Local upgrade to meet required FF
25		J-4037	J-4034	250 mm, PVC	32	Built Up	50 Ave south to 44 St	\$1,700	\$54,400	\$8,160	\$16,320	\$78,880	\$80,000	Local upgrade to provide looping to improve the level of service here

Notes:

1. AC = Asbestos Cement
CI = Cast Iron
FF = Fire flow
HWY = Highway
WTP = Water Treatment Plant
2. Upgrades are grouped by location - sometimes there is more than one upgrade per location.
3. Pipe length is based on the model scaled length.
4. Cost Estimates are conceptual.
5. Costs are in 2015 dollars and are based on historical costs as provided by the City of Lloydminster.
7. The total cost is the cost for the entire upgrade group.



Legend

City Boundary

EXISTING PIPE SIZES

- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other



Reservoir / WTP



Hydrant Flow Test Location (Oct 15-16, 2014)



Monitoring Hydrant Location (Oct 15-16, 2014)



Additional Hydrant Flow Test Location (July 9, 2015)



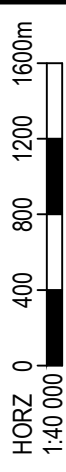
Additional Monitoring Hydrant Location (July 9, 2015)

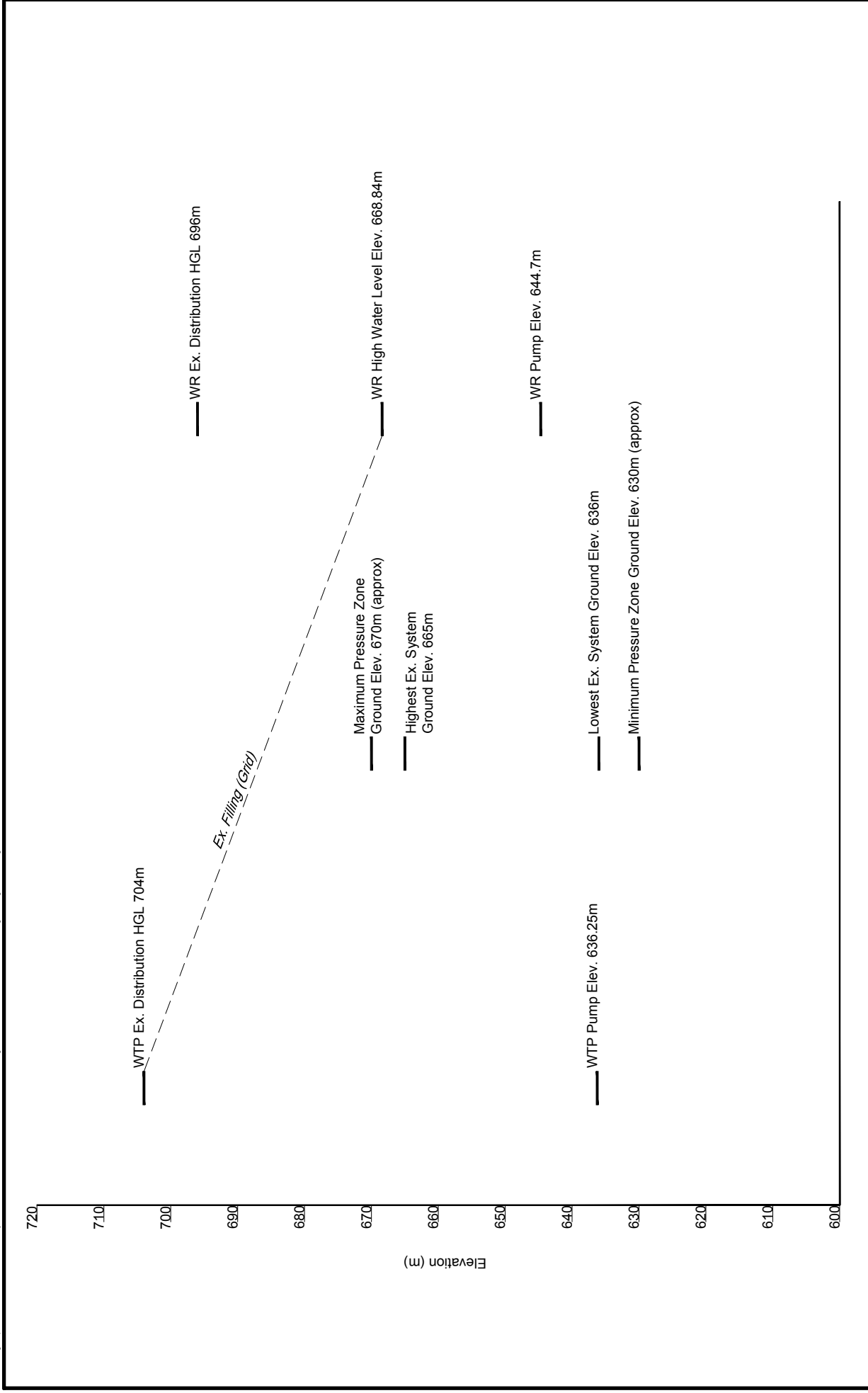


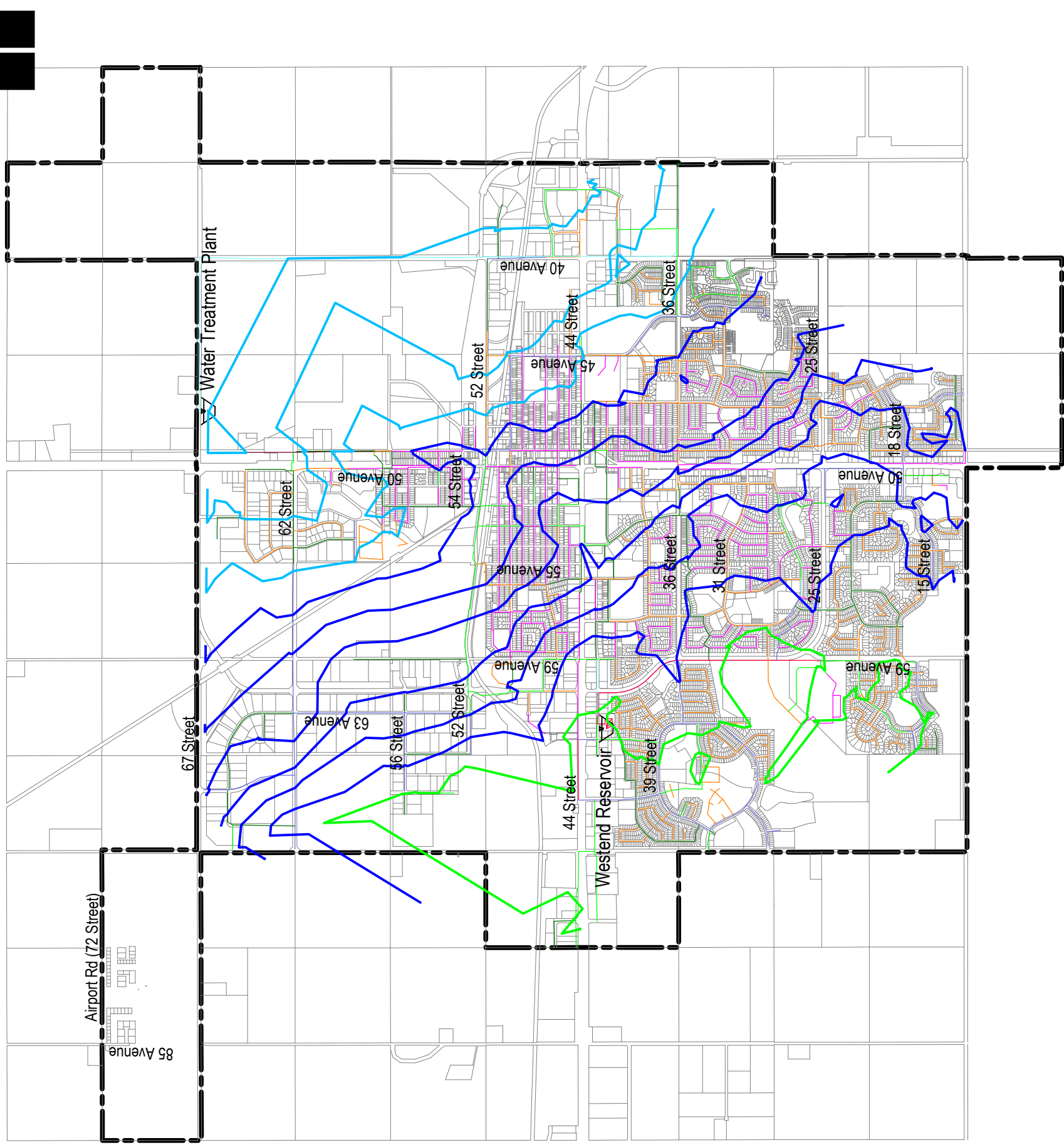
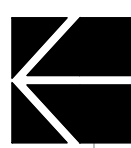
Data Logger Locations (October 15-16, 2014)



Data Logger Locations (July 9, 2015)

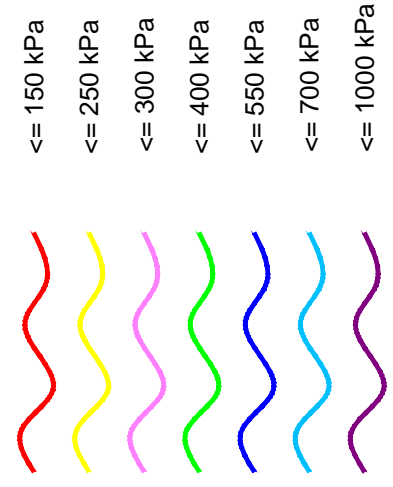






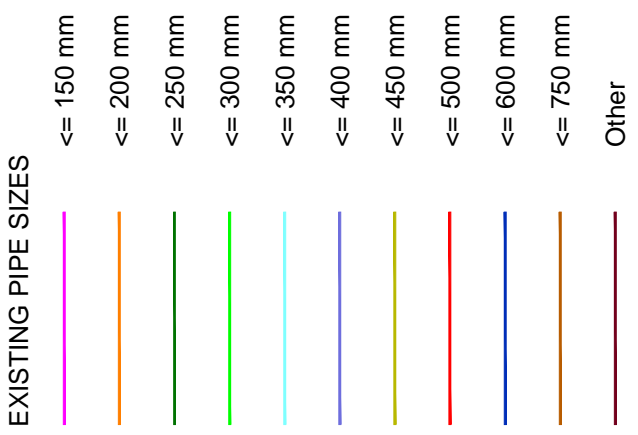
Legend

AVERAGE DAY PRESSURE CONTOURS

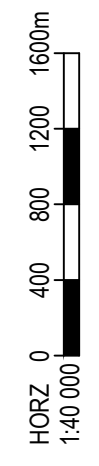


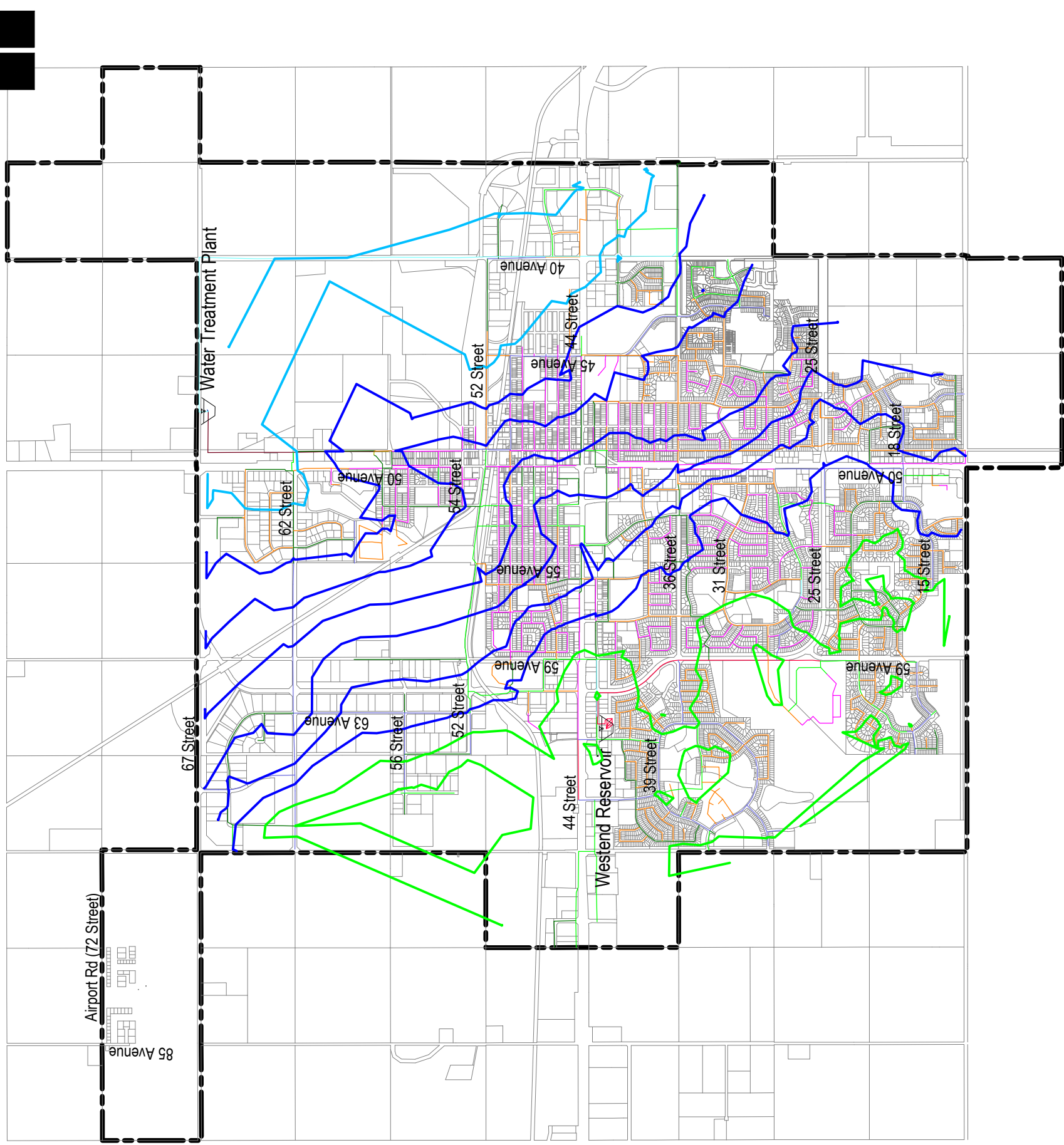
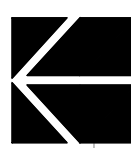
NOTE: Pressure Contour Interval = 25 kPa

EXISTING PIPE SIZES



Reservoir / WTP





Legend

MAXIMUM DAY PRESSURE CONTOURS

- <= 150 kPa
- <= 250 kPa
- <= 300 kPa
- <= 400 kPa
- <= 550 kPa
- <= 700 kPa
- <= 1000 kPa

NOTE: Pressure Contour Interval = 25 kPa

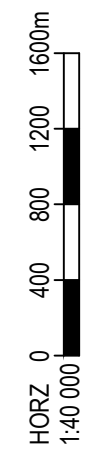
City Boundary

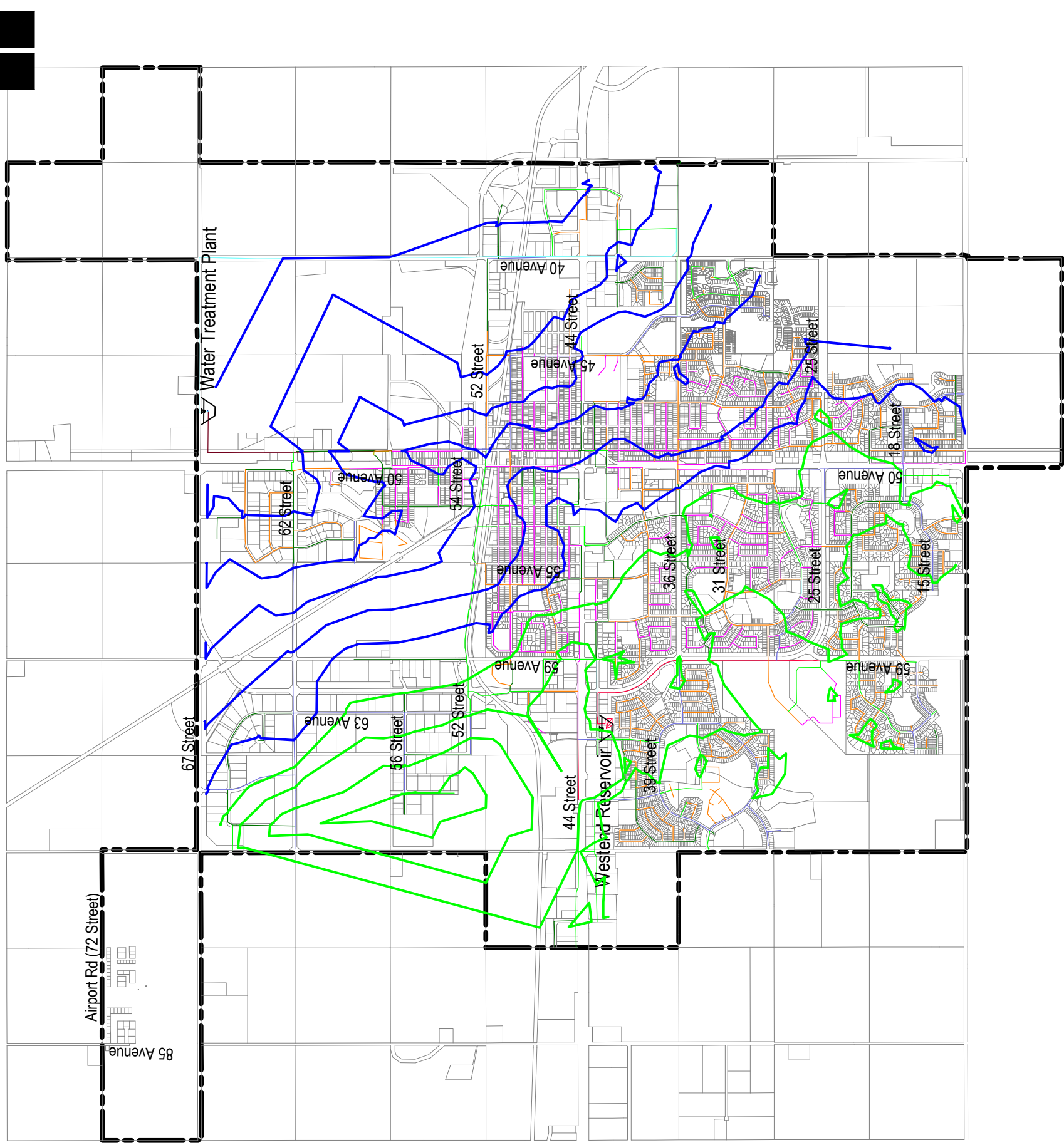
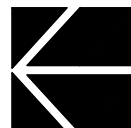
City Boundary

Reservoir / WTP

EXISTING PIPE SIZES

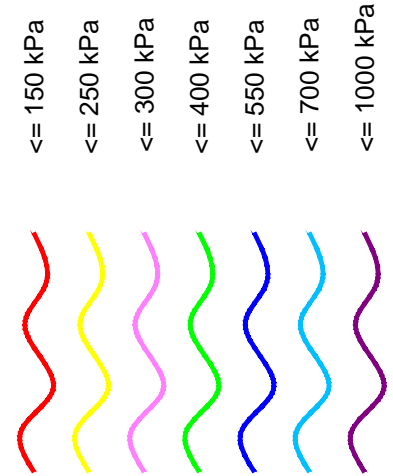
- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other





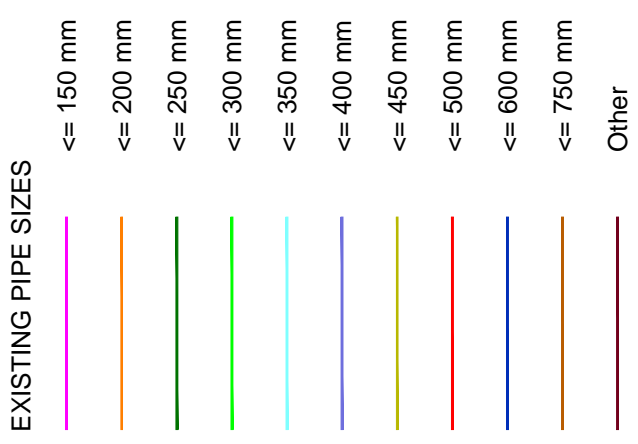
Legend

PEAK HOUR PRESSURE CONTOURS

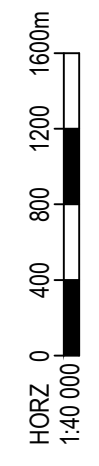


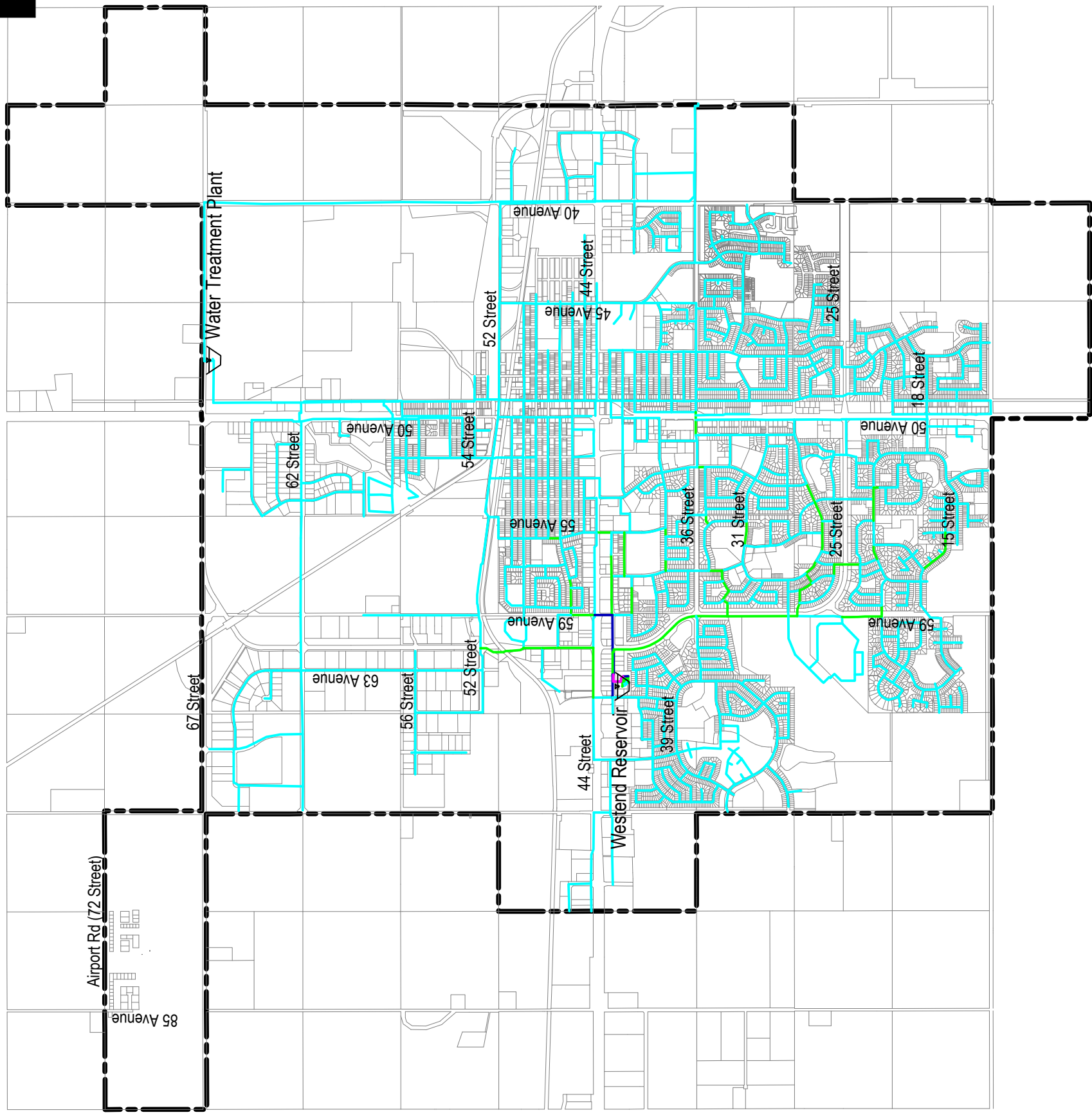
NOTE: Pressure Contour Interval = 25 kPa

EXISTING PIPE SIZES



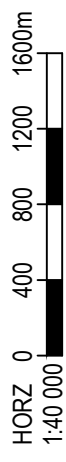
Reservoir / WTP

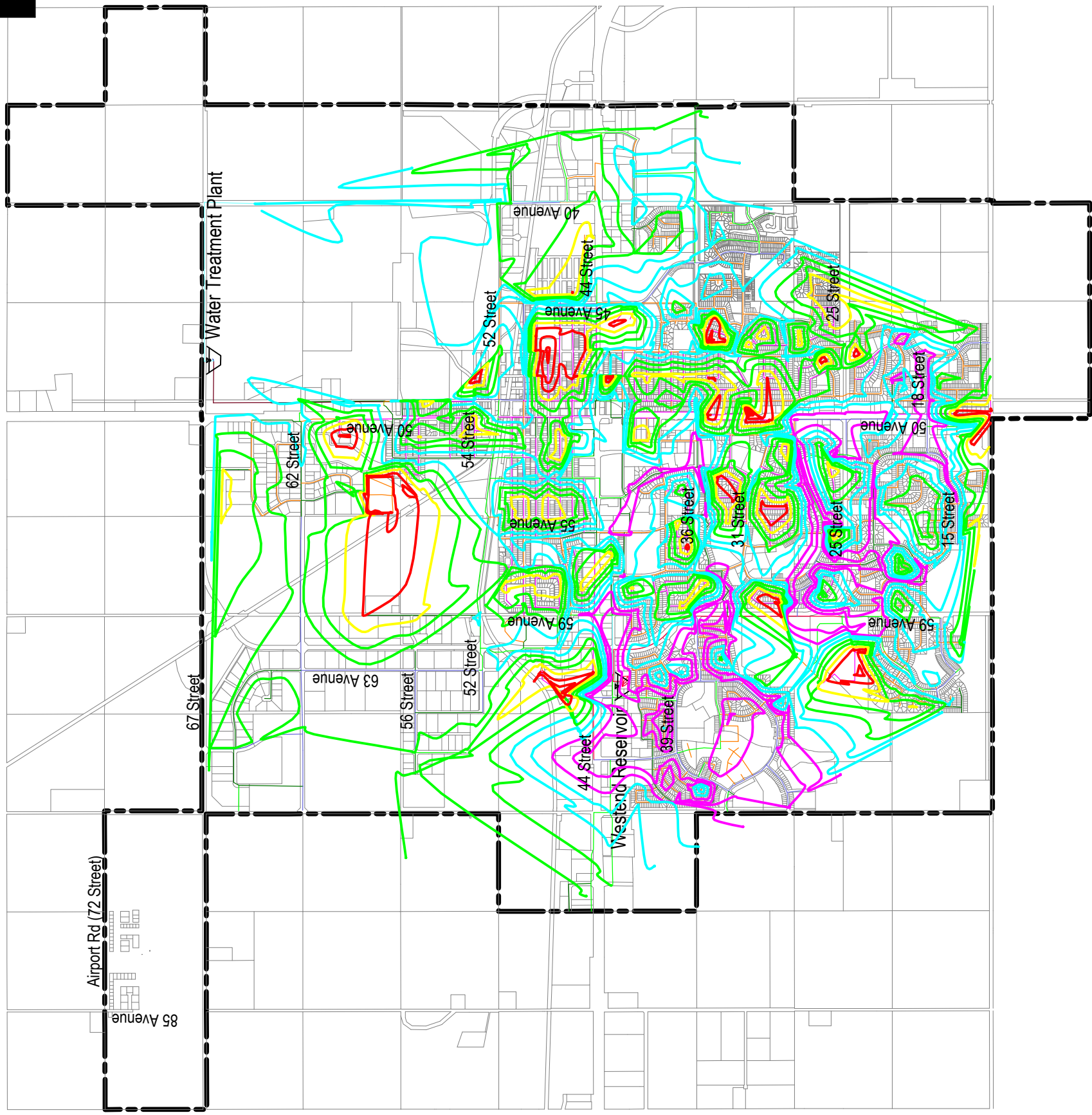
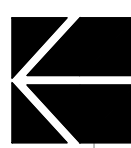




Legend

- City Boundary
- Reservoir / WTP
- EXISTING PIPE VELOCITY**
- = 0.50 m/s
- = 1.00 m/s
- = 1.50 m/s
- = 2.00 m/s
- = 2.50 m/s
- = 3.00 m/s





Legend

FIRE FLOW CONTOURS

- <= 100 L/s
- <= 150 L/s
- <= 185 L/s
- <= 225 L/s
- <= 300 L/s

NOTE: Fire Flow Interval = 25 L/s

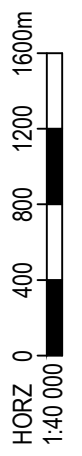
City Boundary

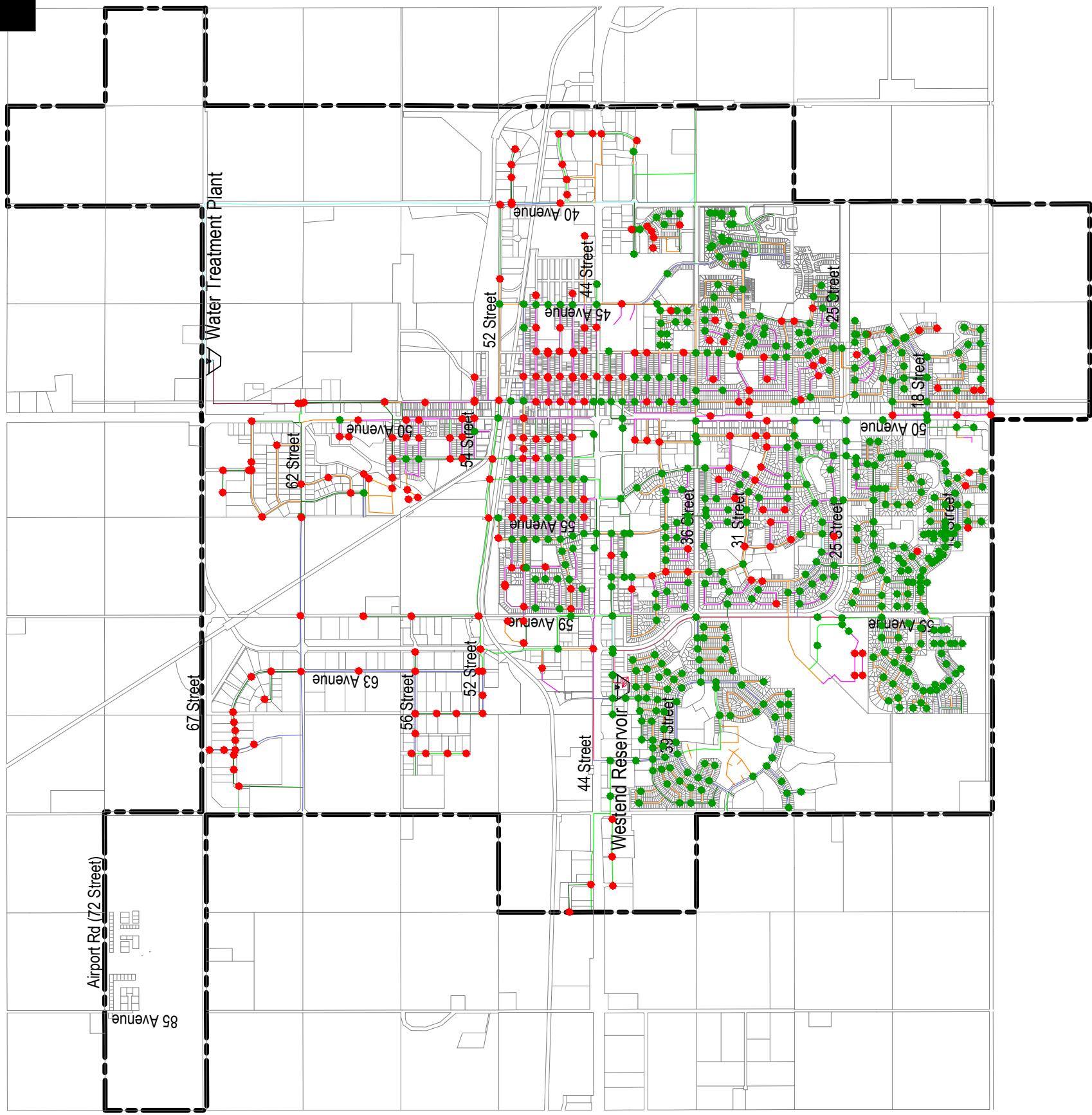
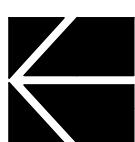


Reservoir / WTP

EXISTING PIPE SIZES

- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other





Legend

City Boundary

EXISTING PIPE SIZES

- ≤ 150 mm
- ≤ 200 mm
- ≤ 250 mm
- ≤ 300 mm
- ≤ 350 mm
- ≤ 400 mm
- ≤ 450 mm
- ≤ 500 mm
- ≤ 600 mm
- ≤ 750 mm
- Other



Reservoir / WTP



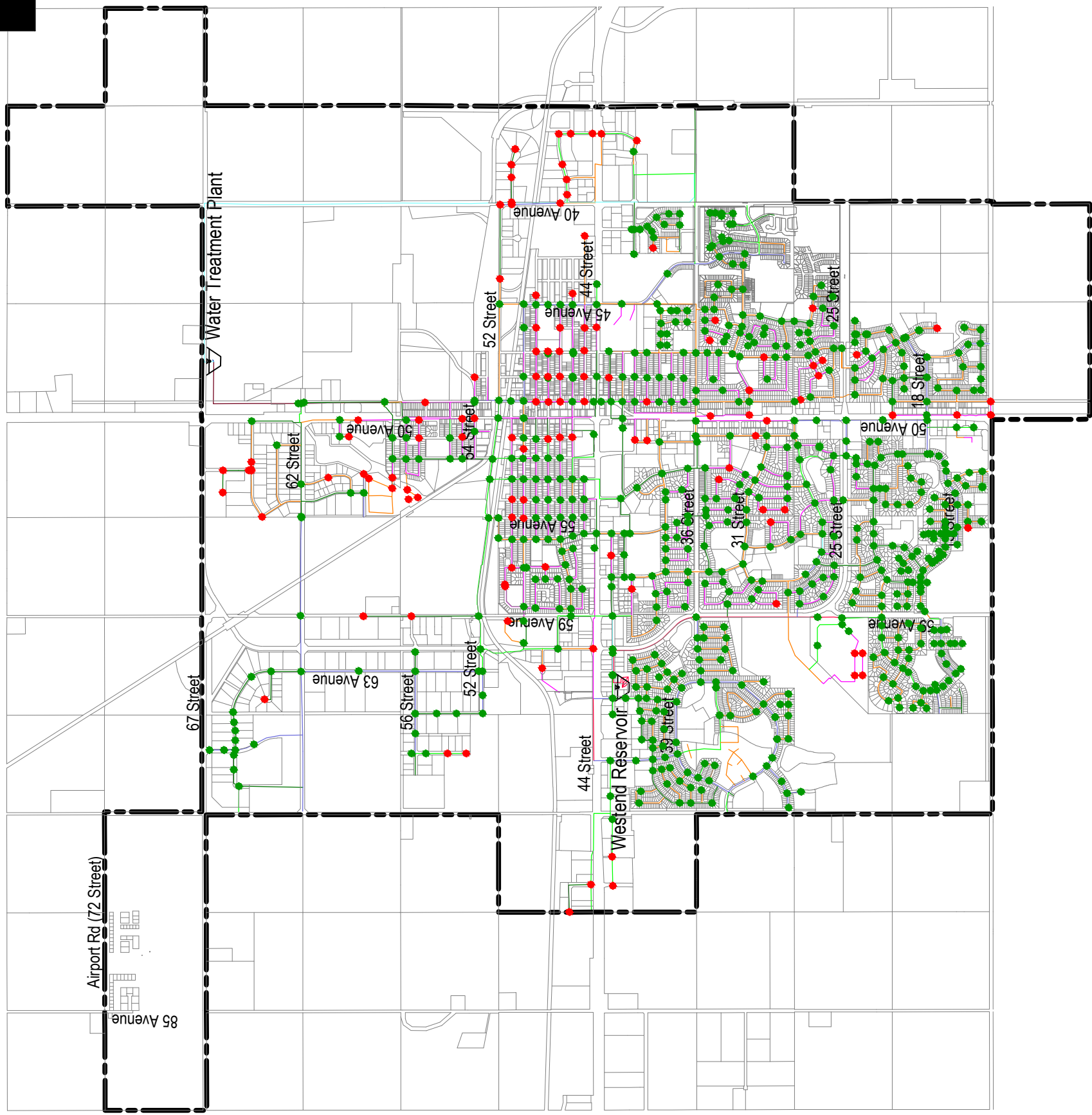
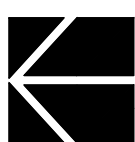
Does Not Meet Fire Flow Requirements



Meets Fire Flow Requirements







Legend

City Boundary

EXISTING PIPE SIZES

- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other



Reservoir / WTP



Does Not Meet Fire Flow Requirements



Meets Fire Flow Requirements





Legend

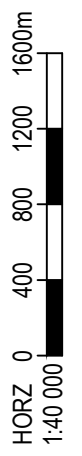
- City Boundary
- EXISTING PIPE SIZES**
- ≤ 150 mm
- ≤ 200 mm
- ≤ 250 mm
- ≤ 300 mm
- ≤ 350 mm
- ≤ 400 mm
- ≤ 450 mm
- ≤ 500 mm
- ≤ 600 mm
- ≤ 750 mm
- Other

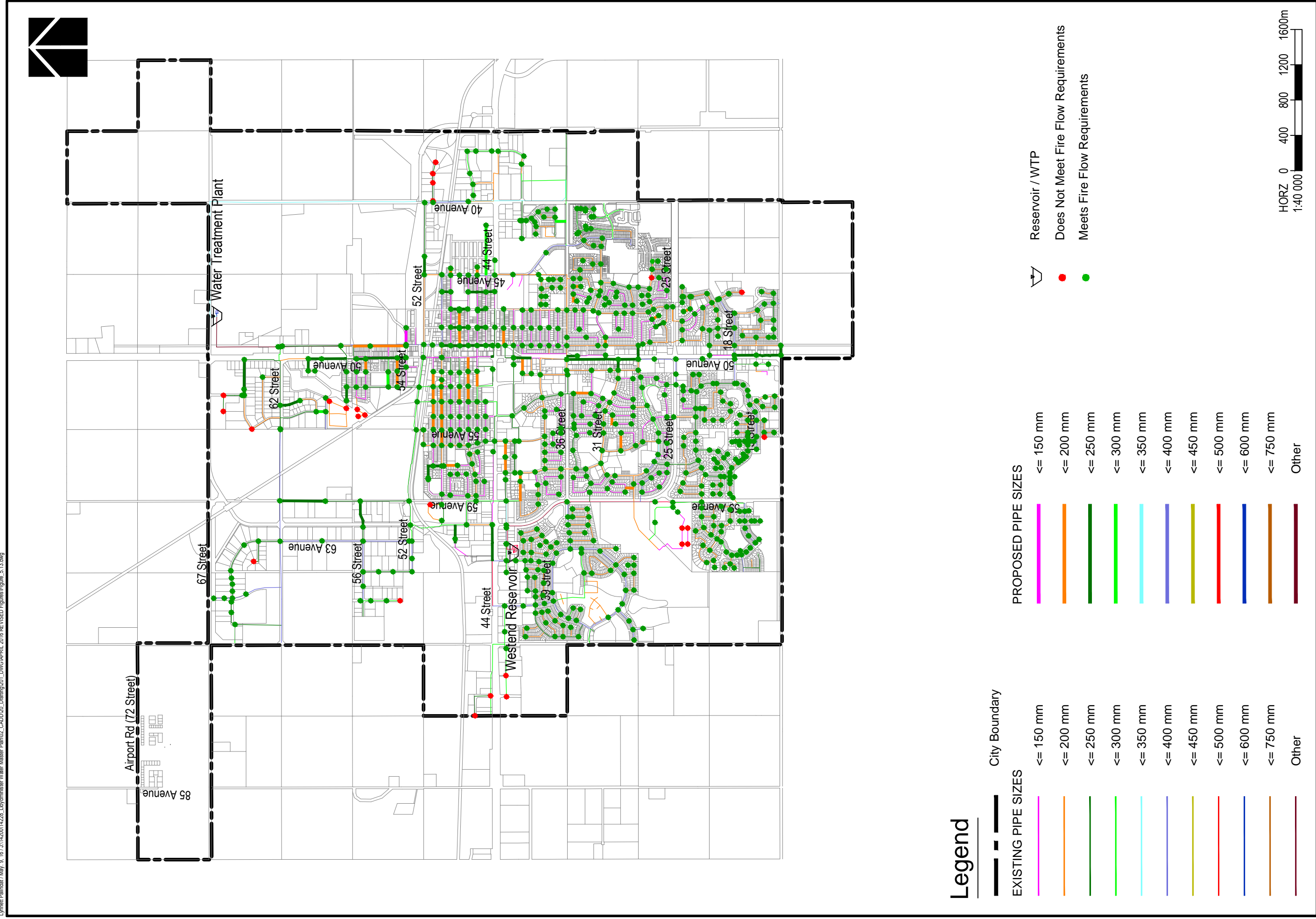
- PROPOSED PIPE SIZES**
- ≤ 150 mm
- ≤ 200 mm
- ≤ 250 mm
- ≤ 300 mm
- ≤ 350 mm
- ≤ 400 mm
- ≤ 450 mm
- ≤ 500 mm
- ≤ 600 mm
- ≤ 750 mm
- Other

- FIRE FLOW CONTOURS**
- ≤ 100 L/s
- ≤ 150 L/s
- ≤ 185 L/s
- ≤ 225 L/s
- ≤ 300 L/s

NOTE: Fire Flow Interval = 25 L/s

Reservoir / WTP







6.0 Future System Assessment

6.1 Future Water Model and Demands

As part of the future water distribution system analysis, the WaterCAD model of the existing system was expanded to include piping and demands for projected growth areas (3, 5, 10 and 20 years). Using this expanded model to perform a hydraulic analysis, future servicing needs and any existing system upgrades needed to service future development were assessed. In addition using model simulations or spreadsheet calculations, where appropriate, the need for any new pressure zones, reservoir storage requirements, and the West End reservoir fill line sizing and pumping requirements were determined.

As summarized in Section 4, future growth projections and updated Lloydminster design standard criteria have been used to projection future water demands. These future demand calculations for each model node are provided in Appendix A (Table A2). The future growth areas are shown on Figure 6.1 (see also Figure 6.2 for land uses). The demands calculated as part of Section 4 are summarized in Table 6.1 below, using a maximum day demand peaking factor of 2 (MDD = 2 x ADD) in agreement with the current City design standards. The proposed design standards recommends keeping a MDD peaking factor of 2 for distribution system design. This is a typical, somewhat conservative number and will provide some flexibility in future servicing and mitigate impacts of highly fluctuating short-term demands.

Table 6.1: Future Water Demands for Distribution System Modeling (MDD = 2 x ADD)

GROWTH HORIZON	YEAR	ADD			MDD			PHD		
		TOTAL			TOTAL			TOTAL		
		L/s	m ³ /hr	m ³ /day	L/s	m ³ /hr	m ³ /day	L/s	m ³ /hr	m ³ /day
EXISTING	2014	127	456	10,943	253	912	21,886	380	1368	32,829
3 YEAR	2018	161	578	13,874	321	1156	27,748	482	1734	41,621
5 YEAR	2020	186	668	16,031	371	1336	32,062	557	2004	48,092
10 YEAR	2025	230	826	19,836	459	1653	39,672	689	2479	59,508
20 YEAR	2035	310	1115	26,753	619	2229	53,507	929	3344	80,260

Notes:

1. MDD and PHD are based on the design peaking factors of 2 and 3, respectively.
2. ADD = Average Day Demand, MDD = Maximum Day Demand, PHD = Peak Hour Demand

However, for the WTP and fill line analyses a conservative peaking factor of 2 may not be warranted given the flexible operation of the WTP, which can be operated anywhere from 16 hours to 24 hours per day depending on demands, and staff can ramp up and down water production as desired. In conjunction with City WTP staff, ISL previously completed an analysis of the existing peaking factor at the WTP and determined a historical MDD factor of 1.5. Thus for the WTP and fill line analyses, ISL proposes using a MDD peaking factor of 1.5, with calculated demands as summarized in Table 6.2.

Table 6.2: Future Water Demands for Water Treatment Plant and Fill Line Analysis (MDD = 1.5 x ADD)

GROWTH HORIZON	YEAR	ADD			MDD		
		TOTAL			TOTAL		
		L/s	m ³ /hr	m ³ /day	L/s	m ³ /hr	m ³ /day
EXISTING	2014	127	456	10,943	190	684	16,414
3 YEAR	2018	161	578	13,874	241	867	20,811
5 YEAR	2020	186	668	16,031	278	1002	24,046
10 YEAR	2025	230	826	19,836	344	1240	29,754
20 YEAR	2035	310	1115	26,753	464	1672	40,130
ULTIMATE (40+ YEAR)	2055+	484	1743	41,825	726	2614	62,738

Notes:

1. The actual MDD peaking factor based on historical records is approximately 1.5.
2. ADD = Average Day Demand, MDD = Maximum Day Demand, PHD = Peak Hour Demand
3. Ultimate demands have been considered for the fill line sizing only. All other components of the water system are assessed based upon a maximum 20 Year growth horizon.

6.2 Treated Water Reservoir Storage Analysis

The City of Lloydminster currently stores treated water at the West End Reservoir, which comprises a 4,545 m³ above ground reservoir built in 1971 and a 20,201 m³ underground reservoir built in 2005/2006, with a combined capacity of 24,746 m³ (as shown in Table 6.3 below). A small amount of storage is also located at the clearwell of the WTP, however this water is not counted in the available storage for the system.

Table 6.3: Lloydminster Treated Water Storage Capacity

Location	Storage Volume (m ³)
West End Reservoir	24,746
Water Treatment Plant (not counted in distribution storage)	1,090

According to the Saskatchewan Ministry of Environment Water Security Agency “A Guide to Waterworks Design, EPB 201” (October 2012), the minimum storage capacity should be equal to twice the average daily demand (ADD) for systems requiring fire protection. By comparison, the Alberta guidelines require the minimum storage to be equal to the fire storage (225 L/s x 3 hours) plus equalization storage (25% of MDD), plus emergency storage (15% of ADD) or disinfection contact time storage (whichever is greater). The New West Reservoir Predesign Report (ISL, 2004) for the West End Reservoir additionally considered EPCOR’s sizing criteria of twice the average day demand plus fire flow, but ultimately settled on recommending storages based upon the slight less conservative Saskatchewan guideline (twice the average day demand) and approximately year 2017 populations.

The reservoir storage requirements for Lloydminster based on both Alberta and Saskatchewan guidelines are summarized in Table 6.4. The Saskatchewan guidelines result in storage requirements about 2.5 times greater than the Alberta guidelines; however, the Saskatchewan guidelines for water are to be applied according to the Lloydminster Charter. Furthermore, Alberta’s formula is the least conservative and places a heavy reliance on the raw water intake, raw water supply and water treatment plant to maintain water



supply. When using the Alberta guidelines, a risk assessment should also be undertaken to determine if additional water storage for multiple fires is needed, particularly for larger municipalities.

Table 6.4: Projected Potable Water Storage Requirements

Growth Horizon	Year	Minimum Storage Requirement (m ³)		Storage Surplus/Deficit (+/-)		% Increase in Storage Needed (Saskatchewan)
		Based on Saskatchewan Guideline	Based on Alberta Guideline	Based on Saskatchewan Guideline	Based on Alberta Guideline	
EXISTING	2014	21,886	9,543	2,860	15,203	0%
3 YEAR	2018	27,748	11,448	-3,002	13,298	12%
5 YEAR	2020	32,062	12,850	-7,316	11,896	30%
10 YEAR	2025	39,672	15,323	-14,926	9,423	60%
20 YEAR	2035	53,507	19,820	-28,761	4,926	116%

Note:

1. Current available storage is 24,746 m³ at the West End Reservoir.
2. Saskatchewan provincial guidelines for water are to be used for Lloydminster as specified in the Lloydminster Charter.
3. To be conservative, the Alberta reservoir sizing is based on MDD calculated with a peaking factor of 2 rather than 1.5 (MDD = 2 x ADD). Also, emergency storage volume is used rather than disinfection contact time storage volume as disinfection contact time is not known. A 3 hour fire at 225 L/s was considered for calculation of the fire storage.

On the basis of the Saskatchewan guidelines, current storage requirements for the City are being met however additional storage is needed to service the 3 year growth horizon and beyond. Given that the West End Reservoir was sized to service growth up to year 2017, the need for expansion in the short-term is to be expected. In fact, the West End Reservoir site was designed with the flexibility to add an additional 9,850 m³ of storage, which was planned to be adequate until 2022. Based on current demand projections, the existing storage may be adequate until about year 2019 or 2020, subject to actual growth and demands. It is recommended that design and construction of this storage expansion start immediately so that the additional storage will be available when it is required.

A third stage of reservoir construction was proposed in the New West Reservoir predesign report (ISL, 2004), which involved demolition of the existing 4,545 m³ above ground reservoir and replacing it with a new 11,000 m³ reservoir (a net gain of 6,455 m³), for a total site storage of 41,051 m³. This was previously projected to be adequate until year 2027, which is still the case based on current projections. It is recommended that design and construction of this storage commence by year 2025, subject to review of actual future demands nearer to that date. For the 20 Year growth horizon projections an additional 12,500 m³ of storage will be required; however, more or less storage may be constructed depending on future growth and demands. This storage may be located at a new site depending on development patterns and available space at the West End Reservoir. This master plan (as directed by the City) proposes that the 20 Year expansion will be sited at the current West End Reservoir site and any necessary downstream pipe upgrades will be identified on this basis.

The reservoir expansion requirements are summarized in Table 6.5. It should be noted that reservoir expansion needs are completely driven by projected population growth and the future demand rate basis applied to this project (Section 4, and Section 6.1 above). Any change in the assumptions will affect the timing of reservoir expansion and potentially the amount of storage added with each expansion. Population

growth and historical water demands should be reviewed and the storage requirements updated as part of the expansion design process in the future.

Table 6.5: Summary of West End Reservoir Expansion Needs

Growth Horizon	Year	Storage Requirement (m ³)	Additional Storage Required (m ³)	Additional Storage to be Constructed (m ³)	Available Storage (after Upgrade, if applicable) (m ³)
EXISTING	2014	21,886	0	0	24,746
3 YEAR	2018	27,748	3,002	9,850	34,596
5 YEAR	2020	32,062	0	0	34,596
10 YEAR	2025	39,672	5,076	6,455	41,051
20 YEAR	2035	53,507	12,456	~13,000	~54,000

Notes:

- Storage to be constructed for 20 Year horizon is dependent on Ultimate servicing needs.

6.3 West End Reservoir Fill Line Analysis

The City has indicated that they wish change the operation of the system to instead distribute water from the WR only, except under emergency conditions at which time distribution from the WTP may occur. Furthermore, the WR will be supplied by a new dedicated fill line to be constructed between the WTP and WR. Conclusive sizing of the fill line and operational recommendations are required as part of this master plan.

6.3.1 Design Fill Rate

According to the Saskatchewan Ministry of Environment Water Security Agency “A Guide to Waterworks Design, EPB 201” (October 2012), the design of supply pipelines should be based on maximum day demands with consideration given to supply and treatment capacities, and potential demands within the life of the pipeline. The water treatment plant, which will be providing the water for the fill line with only minimal on-site storage available (1,090 m³), is also sized based upon maximum day demand. A water transmission line can have a design life of more than 40 years, and so MDD demands for a growth horizon beyond the 20 years used for most of the master plan was required. As indicated in Table 6.2, the “ultimate” MDD for the City (40+ years) has been calculated to be 726 L/s based on a 1.5 peaking factor. Table 6.6 lists calculated fill rates based upon MDD for the various growth horizons.



Table 6.6: Calculated Filling Rates Based on Design Max Day Demand

GROWTH HORIZON	YEAR	24 Hour Fill Rate (Design MDD)	
		L/s	m ³ /hr
EXISTING	2014	190	684
3 YEAR	2018	241	867
5 YEAR	2020	278	1002
10 YEAR	2025	344	1240
20 YEAR	2035	464	1672
ULTIMATE (40+ YEAR)	2055+	726	2614

Notes:

1. MDD peaking factor = 1.5 (MDD = 1.5 x ADD), see Section 6.1 for discussion of peaking factors.

To confirm that the design future demand criteria proposed above are reasonable, a sensitivity analysis on the demand calculations and resulting required fill line flow rate has been performed. Two demand alternatives were examined, both calculated based on the growth projections developed for this project (Section 4.4) and using 1.5 as the MDD peaking factor:

- MDD calculated using the proposed design standards as in Table 6.6 above (e.g. 250 L/cap/day and the applicable non-residential rates; Refer to Table 4.6), which from experience are conservative.
- MDD calculated using demand rates estimated from current consumption as in Table 6.7 below (e.g. 175 L/cap/day and the applicable lower non-residential rates; Refer to Table 4.5). Here these calculated demands will be referred to as the “extrapolated current” demands rates. This scenario results in demands that are about 33% lower than using the proposed design standards.

Table 6.7: Calculated Filling Rates Based on “Extrapolated Current” Max Day Demands

Growth Horizon	Year	24 Hour Fill Rate (Extrapolated MDD)	
		L/s	m ³ /hr
EXISTING	2014	190	684
3 YEAR	2018	218	784
5 YEAR	2020	238	856
10 YEAR	2025	274	987
20 YEAR	2035	343	1235
ULTIMATE (40+ YEAR)	2055+	489	1760

Notes:

1. MDD peaking factor = 1.5 (MDD = 1.5 x ADD), see Section 6.1 for discussion of peaking factors.
2. These values are provided for information only, and are not used as the basis for design.

Combining these two demand alternatives above, fill rate scenarios were created which are plotted on Figure 6.3. The fill rates based on design MDD calculations (Table 6.6) will be used as the basis for the fill line sizing and pumping analysis, although actual demands are expected to fall somewhere between the two demand scenarios shown on Figure 6.3.

ISL recommends that the proposed fill line be sized based on the future 726 L/s rate for ultimate development within the design life of the pipeline. Interim fill rates for pump phasing and sizing are summarized in Table 6.8, which are repeated from Table 6.6.

Table 6.8: Proposed Future Fill Line Filling Rates

GROWTH HORIZON	YEAR	24 Hour Fill Rate (Design MDD)	
		L/s	m ³ /hr
EXISTING	2014	190	684
3 YEAR	2018	241	867
5 YEAR	2020	278	1002
10 YEAR	2025	344	1240
20 YEAR	2035	464	1672
ULTIMATE (40+ YEAR)	2055+	726	2614

Notes:

1. Future rates at each growth horizon/year are subject to actual future consumption.

6.3.2 Dedicated Fill Line Design and Sizing

Given the design fill rates summarized in Table 6.8, a variety of pipe sizes for the fill line were investigated. A series of system curves indicating the total dynamic head for the system (the static head or elevation difference between the WTP and WR, plus the total friction and minor head losses at different flow rates) were prepared. These are shown on Figure 6.4. From Figure 6.4 it can be observed that headlosses for 450 mm to 600 mm pipe sizes are excessive at the design flow rates, and would lead to high energy costs, if pumps are even available to accommodate the design heads. Either a 750 mm or 900 mm diameter DR 25 PVC transmission main (or equivalent) are feasible depending on pumping requirements, which are described in the following section.

A previous design for the dedicated fill line prepared by Select Engineering in 2014 proposed a 750 mm main (Figure 6.5); the design flow basis is not known to ISL. That design indicated that the fill line would tie into the existing 762 mm steel main at 49 Avenue and 62 Street using two 45° bends to transition from the southward existing pipe to the westward dedicated fill line. A series of 300 mm piping and valves would maintain connection between the north and south halves of the existing 762 mm main. This configuration would introduce additional head losses that would limit the ability of WTP to supplement fire flows to the City or supply the entire system during an emergency with the fill line and/or West End Reservoir.

It is recommended that this tie-in be redesigned to allow for unimpeded distribution of water from the WTP in an emergency; refer to Figure 6.5. This may involve a 762 mm / 750 mm tee and large diameter valves installed on the 762 mm steel pipe, or possibly limited local reduction in pipe diameter to 600 mm or 500 mm to make valve and tee installation more cost effective will minimizing additional head losses. The most cost effective option would be determined during detailed design. The valves at this tie-in location will also require actuators and a control system such that WTP operators can easily switch from reservoir filling to emergency distribution / fire flow supply. It should be noted that reservoir filling will not occur during emergency conditions due to this configuration. The dedicated line would need to extend all the way back to the WTP pumphouse if the City desires the option to perform reservoir filling and emergency or fire flow supply from the WTP concurrently.

The decision to start the dedicated fill line at 62 Street or extend it back to the WTP is dependent upon the factors discussed in Table 6.9. The key factor is chlorine contact time for customers located near the WTP.



After chlorine is added to the water, adequate time must be allowed for the chemical to disinfect the water prior to it being delivered to the first customer. Since the WTP has only a small clearwell on site, newly disinfected water will be released into the system shortly after contact. Chlorine contact times prior to delivery to the first customer downstream of the WTP will be assessed as part of the WTP assessment, and that information is not available at present. If it is found that chlorine contact time is not adequate, then the fill line should extend back to the WTP so that those customers will receive water from the West Reservoir rather than directly from the WTP. However if contact times are not a concern, then the option to start at 62 Street is cheaper while still being feasible. In any case if adequate funding is available, it is recommended that the fill line be extended back to the WTP to make it a true dedicated line to allow for future flexibility in the system.

All fill line analyses have been performed on the basis that the fill line starts on 62 Street however if it is extended back to the WTP, there is little difference in the hydraulics of the system. There is less than a 3m headloss difference between the alternatives, or less than 5% change in headloss. This makes very little difference in the pump capital costs, and reduces the annual pump energy costs by less than 5%.

Table 6.9: Factors Determining Fill Line Starting Point

Factor	62 Street Tie-In	WTP Tie-In
Fill Line Length	6.31 km dedicated line to 62 Street/50 Avenue	7.21 km dedicated line to WTP
Fill Line Probable Cost	\$15.6 Million (assuming 750 mm dedicated line)	\$17.8 Million (assuming 750 mm dedicated line)
Ease of Control	An actuated valve is required at that tie-in to control flow between the dedicated line and the rest of the system. The tie in location is located about 1 km from the WTP, so not as easy to access in an emergency.	The control valves can be incorporated at or near the WTP, which may be preferable in case of actuator failure.
Construction	No additional construction concerns	Starting the dedicated line at the WTP may require changes to the distribution headers at the WTP pumphouse to allow for tie-in to the existing pumps. This would need to be reviewed at detailed design.
Flexibility in System Operation	Less flexibility in system operation	Extending the dedicated fill line to the WTP will allow the West End Reservoir to be filled at the same time as flow is supplied to the distribution system from the WTP, depending fill rates, available pumping capacity, and details of the tie-in. This will allow more flexibility in servicing during emergencies.
Chlorine Contact Time	Users connected to the existing 762 mm main near the WTP need to have adequate disinfection contact time. Under existing conditions, or if the dedicated line ties in at 62 Street, the contact time may be too short (to be confirmed as part of the WTP assessment portion of this study).	Extending the dedicated fill line to the WTP will ensure that customers near the WTP receive water from the West End Reservoir rather than the WTP, and so chlorine contact time will no longer be a concern.

6.3.3 WTP/Dedicated Fill Line Pumping

There are two main options to provide pumping for the dedicated fill line:

- Use the existing WTP distribution pumps to supply the dedicated line.
- Installing new dedicated pumps for the fill line and maintaining the existing WTP distribution pumps for emergency supply.

In either case, it is recommended to maintain the pressure sustaining valve (PSV) at the West End Reservoir, because:

- For option 1 (using existing pumps), the best operating point of the existing pumps were designed to meet a higher required pumping head so if the PSV is not maintained at an appropriate pressure the pumps will not run efficiently.
- For option 2 (using new pumps), the new pumps to be installed may not be designed to be redundant so the existing distribution pumps may still be called upon to fill as alternative pumps. To optimize the existing pump operation, the PSV is recommended as above. Furthermore, the PSV set at a minimal pressure (e.g. 20 kPa) will ensure that positive pressures are maintained at high points on the fill line profile.

Each option is discussed below in the following sections, and the basis of the analyses are indicated where appropriate. It should be noted, however, that:

- The fill line is being designed to operate under MDD flow conditions, and all analyses have been made on this basis. Operation under demands less than MDD has not been explicitly examined. Variable speed pumps can provide flexibility in adapting from MDD to ADD flows and this should be examined closer in the future, particularly during new pump selection with assistance from the pump supplier.
- Chlorine residuals and residence time in the pipeline has not been considered.

Similar to the reservoir expansion analysis, it should be noted that fill line pumping needs are completely driven by projected population growth and the future demand rate basis applied to this project (Section 6.1). Any change in the assumptions will affect the timing and capacity of pump upgrading/expansion. Population growth and historical water demands should be reviewed as part of the pump upgrading process in the future and the fill line pumping requirements updated as needed.

Option 1 – Use Existing WTP Distribution Pumps

Based on the system curves presented in Figure 6.4, a 750 mm fill line requires slightly higher pumping heads than a 900 mm fill line. Given that PSV operation will be required to optimize pump efficiency, the need for slightly higher pumping heads is not a problem and so the previously proposed 750 mm fill line would be adequate if the existing pumps were to be used for as long as possible. System curves for a 750 mm and 900 mm fill line with combinations of the existing pumps are shown in Figures 6.6 and 6.7, and details are summarized on Table 6.10 (following page 34). It should be noted that the variable speed pump (Pump 103) is shown assuming only two speeds (frequencies): 50 Hz and 60 Hz. Any practical speed could be used which would change the results presented here, but should not affect the overall conclusions.

In order to optimize the performance of the existing pumps and minimize energy consumption, the PSV setting at the West End Reservoir has been varied from 0 kPa (inactive) to 220 kPa. The PSV effectively increases the static head required to be overcome by the pumps but it does not change the curvature of the system curve, which is controlled by friction losses. If a 900 mm fill line were to be constructed, the PSV setting would need to be further increased to maintain efficient pump operation

The 24 hour filling operation was assessed for certain growth horizons to determine the more cost effective pumping strategy. It should be noted not all possibilities are assessed because of the flexibility in variable speed pump operation. Some scenarios require all three existing pumps to operate which is not

Table 6.10: Dedicated Fill Line Pumping Using Existing WTP Distribution Pumps

Operating Scenario	Horizon	Filling Duration (hours)	Average Day Demand		Maximum Day Demand (Fill Rate)		Fill Line Diameter (mm)	WR PSV Setting (kPa)	Operating Flow Rate		Operating Head (m)	Pump Efficiency @ Operating Point (%)	Pumps "ON"	Input Power		Specific Energy (kWh/m ³)	Electricity Cost (\$/kWh)	Annual Electricity Cost (\$)
			(m ³ /s)	(m ³ /hr)	(m ³ /s)	(m ³ /hr)			(m ³ /s)	(m ³ /hr)				(hp)	(kW)			
1	Existing	24 Hours	0.127	456	0.190	684	750	200	0.191	688	60.0	82%	103 (VSP 60 Hz)	204	152	0.221	\$0.10	\$88,329
2	Existing	24 Hours	0.127	456	0.190	684	900	220	0.191	688	60.0	82%	103 (VSP 60 Hz)	204	152	0.221	\$0.10	\$88,329
3	5 Year	24 Hours	0.186	668	0.278	1002	750	100	0.281	1012	53.5	71%	101, 103 (VSP 50 Hz)	346	258	0.255	\$0.10	\$149,445
4	5 Year	24 Hours	0.186	668	0.278	1002	900	135	0.281	1012	53.5	71%	101, 103 (VSP 50 Hz)	346	258	0.255	\$0.10	\$149,445
5	10 Year	24 Hours	0.230	826	0.344	1240	750	170	0.345	1242	64.5	81%	101, 103 (VSP 60 Hz)	373	278	0.224	\$0.10	\$162,087
6	10 Year	24 Hours	0.230	826	0.344	1240	900	0	0.365	1314	42.7	74%	101, 103 (VSP 50 Hz)	432	322	0.245	\$0.10	\$177,420
7	20 Year	24 Hours	0.310	1115	0.464	1672	750	0	0.473	1703	54.5	71%	101, 102, 103 (VSP 50 Hz)	583	435	0.255	\$0.10	\$249,403
8	20 Year	24 Hours	0.310	1115	0.464	1672	900	70	0.473	1703	54.5	71%	101, 102, 103 (VSP 50 Hz)	583	435	0.255	\$0.10	\$249,403
9	Target	24 Hours	0.484	1743	0.726	2614	750											
10	Target	24 Hours	0.484	1743	0.726	2614	900											

Notes:

- Horizons are approximate and depend on actual consumption rates in the future. Operation will require review at regular intervals to determine best combination of variables to optimize pump operation.
- Operating scenarios 7 and 8 (20 Year Horizon) are not recommended because all three existing pumps are required to operate at once, which leaves no redundancy.
- Input Power (hp) = (Operating Flow Rate*15850.2*Operating Head^3.2808)/(3960*Pump Efficiency*0.9); multiply by 0.7457 to convert to kW
- Input power assumes 90% motor efficiency.
- Specific Energy (kWh/m³) = Input Power / (Operating Flow Rate*3600)
- Annual Electricity Cost (\$) = Average Day Demand*Specific Energy*Electricity Cost*3600*24*365



recommended since it leaves no redundancy in case of a pump failure. Table 6.10 includes a summary of the estimated pumping energy cost for each scenario, assuming a fixed electricity cost of \$0.10/kWh. At the Ultimate growth horizon, new pumps will be required to provide a filling rate of 0.726 m³/s (2614 m³/hour) at 63 to 76 m of head depending on the fill line diameter (750 mm or 900 mm). For the purpose of this analysis, it is expected that, at the time of pump upgrading, the distribution pumps will remain for emergency and fire flow supply while a new set of dedicated pumps for the fill line will be installed. This may trigger the need for expansion of the WTP pumphouse and clearwell. The actual timing of pump upgrading should be refined in the future considering actual flows at the time, not just the stated growth horizons.

Option 2 – Install New Dedicated Pumps

Option 2 involves installing new dedicated pumps while maintaining most or all of the existing WTP distribution pumps. Figures 6.8 and 6.9 illustrates the 750 mm and 900 mm diameter fill line system curves with potential new pumps, which were selected in consultation with a pump supplier. These curves assume that the PSV would be set at a value of 20 kPa, although this is flexible. These pumps are an example of possible pumping configurations, however if this option is selected final pump selection will require further study. Table 6.11 (following page 36) summarizes the pumping details and energy costs for the new pumps.

This option can use either a 750 mm or 900 mm fill line diameter, although the 900 mm option results in somewhat lower system head. (Table 6.12 as shown below). The lower pumping head will also result in energy cost savings, although there will be an increase in the fill line construction cost to upsize from 750 mm to 900 mm compared to Option 1.

Table 6.12: Comparison of Pumping Heads for 750 mm and 900 mm Fill Lines (PSV @ 20 kPa)

Growth Horizon	Fill pipeline size	
	750 mm	900 mm
	DR 25 - 165 psi PVC	DR 25 - 165 psi PVC
	Flow and Head	
Existing	190 L/s @ 41.1 m TDH	190 L/s @ 39.2 m TDH
5 years	278 L/s @ 45.3 m TDH	278 L/s @ 42 m TDH
10 years	344 L/s @ 48.8 m TDH	344 L/s @ 44.4 m TDH
20 years	464 L/s @ 56.2 m TDH	464 L/s @ 49.4 m TDH
Ultimate	726 L/s @ 76.4 m TDH	726 L/s @ 62.7 m TDH

In the near-term (existing conditions), the City can choose to swap out one of the constant speed WTP pumps for a single dedicated pump. Two distribution pumps will remain to provide emergency supply and additional fire flows. However, for the 5 year growth horizon flows and beyond, multiple fill line pumps may be required (subject to detail design pump selection) which would trigger the need for expansion of the clearwell and WTP pumphouse. The actual timing of pump upgrading should be refined in the future considering actual flows at the time, not just the stated growth horizons.

6.3.4 Recommended Fill Line Sizing and Pumping Requirements

The recommendation for a fill line size and pumping option is partly based on a financial analysis to calculate the net present value (NPV) of each option considering:

- Probable costs for the fill line construction (750 mm and 900 mm options)
- Annual electricity costs
- Pump installation costs

- Pump maintenance costs

Conceptual cost estimates for the pumps and construction of the fill line, as well as annual electricity costs, for selected growth horizons are summarized in Table 6.13 (following page 36).

On the basis of electricity and pump costs only, the 900 mm fill line with new pumps is the cheapest option to operate, however the additional costs for the 900 mm pipe rather than 750 mm offsets the small savings. The net present value for the four options have been calculated over a 50 year period, and the results are summarized in Table 6.14. The lowest cost option is to construct a 750 mm fill line and use the existing pumps as long as possible (until the Ultimate growth horizon, at which time upgrades will be required). Varying the electricity cost from \$0.08 to \$0.12 per kWh and the discount rate from 1 to 10% does not change the overall conclusion as the fill line construction cost in the near term dominates the calculation. Increasing the fill line cost to extend back to the WTP rather than terminating at 62 Street (additional 900 m) also does not change the overall conclusion.

Table 6.14: Net Present Value Summary of Fill Line and Pumping Estimates

Pump Scenario	Net Present Value over 50 Years (\$ Million)	
	750 mm Fill Line	900 mm Fill Line
Existing Pumps (new pumps only for Ultimate)	-\$21.26	-\$24.09
All New Pumps	-\$22.05	-\$24.31

Note:

1. Costs are in 2015 Dollars
2. Net present value (NPV) calculation uses a discount rate of 3%
3. Individual costs which were input into the NPV calculation are summarized in Table 6.13.
4. The cashflows are negative due to costs with no earnings. The smallest negative NPV is most desirable option.

Based on the above information, the recommended option is as follows:

- Construct a 750 mm fill line.
- Use the existing WTP pumps to provide pumping for the dedicated fill line until the Ultimate horizon (PSV adjusted accordingly to optimize pump efficiency).
- New pumps will be required by the Ultimate horizon.
- If the existing WTP pumps require replacement before the Ultimate horizon due to maintenance issues, it is recommended that the pumping scenario be re-evaluated. It may be beneficial at that time to transition to a new pumping scenario (i.e. dedicated pumps) based on unknown factors not considered in this analysis.
- It is also recommended that the costs for 750 mm versus 900 mm fill lines be confirmed during detailed design to confirm the recommended option, as the analysis is sensitive to the difference in costs for the two pipe sizes.

The operation of the dedicated fill line for the scenario described above, as well as the Lloydminster water distribution operation are shown diagrammatically on Figure 6.10 (hydraulic grade lines (HGL) and other pertinent elevations).

Table 6.11: Dedicated Fill Line Pumping Using New Dedicated Pumps

Operating Scenario	Horizon	Filling Duration (hours)	Average Day Demand		Maximum Day Demand (Fill Rate)		Fill Line Diameter (mm)	WR PSV Setting (kPa)	Operating Flow Rate		Operating Head (m)	Pump Efficiency @ Operating Point (%)	Input Power		Specific Energy (kWh/m ³)	Electricity Cost (\$/kWh)	Annual Electricity Cost (\$)
			(m ³ /s)	(m ³ /hr)	(m ³ /s)	(m ³ /hr)			(m ³ /s)	(m ³ /hr)			(hp)	(kW)			
1	Existing	24 Hours	0.127	456	0.190	684	750	20	0.190	684	41.1	83%	138	103	0.150	\$0.10	\$60,051
2	Existing	24 Hours	0.127	456	0.190	684	900	20	0.190	684	39.2	83%	131	98	0.143	\$0.10	\$57,132
3	5 Year	24 Hours	0.186	668	0.278	1002	750	20	0.278	1001	45.3	73%	251	188	0.187	\$0.10	\$109,638
4	5 Year	24 Hours	0.186	668	0.278	1002	900	20	0.278	1001	42.0	86%	198	148	0.148	\$0.10	\$86,431
5	10 Year	24 Hours	0.230	826	0.344	1240	750	20	0.344	1238	48.8	87%	281	210	0.169	\$0.10	\$122,523
6	10 Year	24 Hours	0.230	826	0.344	1240	900	20	0.344	1238	44.4	96%	232	173	0.140	\$0.10	\$101,301
7	20 Year	24 Hours	0.310	1115	0.464	1672	750	20	0.464	1670	56.2	84%	453	338	0.202	\$0.10	\$197,367
8	20 Year	24 Hours	0.310	1115	0.464	1672	900	20	0.464	1670	49.4	87%	387	288	0.173	\$0.10	\$168,567
9	Target Ultimate	24 Hours	0.484	1743	0.726	2614	750	20	0.726	2614	76.4	82%	992	740	0.283	\$0.10	\$431,947
10	Target Ultimate	24 Hours	0.484	1743	0.726	2614	900	20	0.726	2614	62.7	84%	794	592	0.226	\$0.10	\$345,717

Notes:

- Horizons are approximate and depend on actual consumption rates in the future. Operation will require review at regular intervals to determine best combination of variables to optimize pump operation.
- Input Power (hp) = (Operating Flow Rate*15850.2*Operating Head*3.2808)/(3960*Pump Efficiency*0.9); multiply by 0.7457 to convert to kW
- Input power assumes 90% motor efficiency.
- Specific Energy (kWh/m³) = Input Power / (Operating Flow Rate*3600)
- Annual Electricity Cost (\$) = Average Day Demand*Specific Energy*Electricity Cost*3600*24*365

Table 6.13: Cost Summary for 750 mm and 900 mm Dedicated Fill Lines with Existing WTP Pumps or New Dedicated Pumps

Horizon	Pumps	Fill Line Cost (6.31 km)		Pump Capital Cost				Annual Electricity Cost	
		750 mm	900 mm	Pump	Installation	Major Overhaul	Total	750 mm	900 mm
Existing	Existing	\$15,640,000	\$18,600,000	\$0	\$0	\$0	\$0	\$88,329	\$88,329
Existing	New	\$15,640,000	\$18,600,000	\$91,000	\$91,000	\$0	\$182,000	\$60,051	\$57,132
5 Year	Existing	\$0	\$0	\$0	\$0	\$0	\$0	\$149,445	\$149,445
5 Year	New	\$0	\$0	\$234,000	\$234,000	\$0	\$468,000	\$109,638	\$86,431
10 Year	Existing	\$0	\$0	\$0	\$0	\$100,000	\$100,000	\$162,087	\$177,420
10 Year	New	\$0	\$0	\$234,000	\$1,234,000	\$0	\$1,468,000	\$122,523	\$101,301
20 Year	Existing	\$0	\$0	\$0	\$0	\$100,000	\$100,000	\$249,403	\$249,403
20 Year	New	\$0	\$0	\$234,000	\$234,000	\$0	\$468,000	\$197,367	\$168,567
Target Ultimate (40 Years)	New	\$0	\$0	\$480,000	\$480,000	\$0	\$960,000	\$431,947	\$345,717

Notes:

1. Costs are in 2015 Dollars
2. Regular pump maintenance costs are not expected to vary significantly between scenarios and so have not been included.
3. The pump installation cost for the 10 year growth horizon with new pumps includes an allowance for expansion of the clearwell and pumphouse at the WTP.



6.4 Pressure Zone Analysis

As discussed in Section 5, the WR distribution pumps are currently set to supply at a pressure of about 305 kPa (44 psi) using variable speed pumps. This is equivalent to a hydraulic grade line (HGL) of 696 m, compared to the HGL of 704 m at the Water Treatment Plant. In order to continue to supply adequate pressures to the City during peak demand periods, the HGL at the WR will need to be raised to a similar level. As a result, it is recommended that the WR variable speed pump distribution pressure setting be raised to 375 kPa (54 psi, 703 m HGL) when the system is switched over to distributing primarily from the WR.

All existing and future system assessments and upgrading recommendations described in this report have been made on the basis of raising the WR distribution pressure to 375 kPa and supplying all demands from the reservoir under normal conditions. Water distribution from the WTP may occur only under emergency conditions, including providing additional fire flows when necessary.

As previously discussed (Section 5.4), the system currently operates as a single pressure zone with no pressure reducing valves or booster stations. The topography of Lloydminster is relatively flat (Figure 1.1), and the ground slopes gently from the southwest (about 664 m) to northeast (about 635 m) with a relief of about 30 m. A single pressure zone can adequately operate under such conditions, and the creation of new pressure zones will not be required unless the system expands to service ground located above about 670 m or below about 630 m.

All future development areas in the 3 to 20 year Growth Horizon (Figure 6.1) are situated at ground elevations ranging from 632 m to 667 m, and as such can be serviced by the existing single pressure zone (see Figure 6.10). It should be noted that the ground elevation range is (630 m to 670 m) is at the practical limits of operating a single pressure zone, and usually a 20 to 30 m spread is more typical. A portion of the City will operate under pressures of between 550 and 700 kPa, which is at the upper limit of pressure requirements. If observed pressures become too high in low elevation areas, a new pressure zone can be created by the installation of system pressure reducing valves, or individual building pressure reducing valves could be installed where needed.

Future development areas in the ultimate horizon (40 years and beyond) are situated at ground elevations ranging from 628 m to 668 m. The land area lower than 630 m elevation constitutes a small local area of about 20 ha east of the wastewater treatment plant. Upon development, the low-lying lands could be filled to raise up finished grades or local PRVs could be installed to mitigate any high pressure concerns.

6.5 Future Distribution System

To plan and assess the future distribution system, the WaterCAD model of the existing water distribution system was updated to include pipe network (250 mm pipes and larger) and demands for future expansion in the 3 year, 5 year, 10 year, and 20 year growth horizon areas (Table 6.1, Figures 6.11, 6.12, 6.13 and 6.14). Section 6.1 discussed the basis of future water demands used for distribution system design, and refer to Figure 6.1 for the growth areas. The proposed pipe upgrades to the existing water distribution system (Section 5.6) were also incorporated in the future systems.

The location of the pipes in the future system are subject to detail design. In addition, looping with smaller pipes to the 250 mm and 300 mm watermains are required in future development areas as the area develops. This will be the responsibility of the developer in each area to determine.

As identified in Section 6.4, no new pressure zones are required for the future development areas in the 3 to 20 year growth horizons.

6.5.1 Future Pumping Requirements at West End Reservoir

The future pumping requirements at the West End Reservoir are summarized in Table 6.15. Based on the pump rated capacity, pumping upgrades may be required as soon as the 3 Year horizon. However, actual pump performance may vary with use of VFD, which may delay the need to upgrade pumps until the 5 year horizon or beyond. Based on modeling, the 3 year horizon should be able to be supplied by the existing WR pumps, in which case a 145 L/s pump upgrade would be required for the 5 year horizon.

Table 6.15: West End Reservoir Future Pumping Capacity Requirements

Growth Horizon	Year	Required Pumping Capacity (PHD)		Available Pumping Capacity at WR (after upgrades, if applicable) (L/s)	Additional Pumping Required for Horizon Based on Rated Capacity	
		(L/s)	(m ³ /hr)		(L/s)	(m ³ /hr)
EXISTING	2014	380	1368	412	0	0
3 YEAR	2018	482	1734	412	70	252
5 YEAR	2020	557	2004	482	75	270
10 YEAR	2025	689	2479	557	132	475
20 YEAR	2035	929	3344	689	240	864

Notes:

1. Rated capacity of WR pumps is 4 x 103 L/s. Actual performance may vary with use of VFD.

6.5.2 Future Distribution System Assessment

The future distribution system model was used to simulate the expected performance under the 3 to 20 year growth horizons, and to recommend additional upgrades to the existing system which are needed to support growth. For this assessment, an “upgraded” pumphouse at the WR with unrestricted pumping capacity (discharge HGL of 703 m or 375 kPa) was used so that appropriate pipe sizes could be determined; pump upgrading needs to meet the require flows in these scenarios are summarized in Table 6.15. The existing WTP pumps (HGL 704 m) were maintained with one constant and one VSP pump operating during fire flow simulations only. Refer to the existing system analysis (Section 5) for more information regarding the strategy of operating the WTP pumps to achieve desired fire flows, which involves pumping from both the WR and WTP during fire flow only. For all other scenarios (ADD, MDD, PHD), supply is only from the WR.

Simulation and assessment of the future system for the above growth horizons were carried out under the following conditions:

- Average Day Demand (ADD)
- Peak Hour Demand (PHD)
- Maximum Day Demand + Fire Flow (MDD + FF)

As a general note, any pipe upgrades described below were required in order to meet peak hour flow and pressure requirements, and in some cases the fire flow requirements, and as such they are dependent upon the future water demands. Changes to the water demand assumptions may change the pipe upgrading requirements, although fire flows may also be reduced if pipe upgrades are scaled back. Note that no velocity constraint was used in the fire flow simulation for the future system model because the calibrated existing model will supply as much fire flow as is available regardless of an arbitrary standard. However, all future system pipes were checked manually to ensure the recommended velocity limit of 3 m/s was met in the future pipes during all scenarios, including under fire flow.



The maximum fire flow requirement for the City is 225 L/s; that value plus the maximum day demand at a particular growth horizon when compared to the peak hour demand will indicate the relative importance of the fire flow requirement in pipe upgrading. A comparison of MDD plus fire flow demands to peak hour demands is shown in Table 6.16.

Table 6.16: Comparison of MDD plus Fire Flow demands to Peak Hour Demands

Growth Horizon	Year	MDD		MDD + FF		PHD		PHD (MDD+FF)
		L/s	m ³ /hr	L/s	m ³ /hr	L/s	m ³ /hr	
EXISTING	2014	253	912	478	1722	380	1368	0.79
3 YEAR	2018	321	1156	546	1966	482	1734	0.88
5 YEAR	2020	371	1336	596	2146	557	2004	0.93
10 YEAR	2025	459	1653	684	2463	689	2479	1.01
20 YEAR	2035	619	2229	844	3039	929	3344	1.10

Notes:

1. MDD + FF is split between the WR and WTP pumps, so PHD governs for pump and pipe sizing at the WR

In the 10 year and 20 year growth horizons, the peak hour demands are similar to the maximum day plus fire flow demands; however, since this analysis is based upon the WTP being used to supplement fire flows, the peak hour demands (which are supplied only by the WR) will govern the pipe sizing in the vicinity of the reservoir.

6.5.3 3 Year Growth Horizon

The future 3 year water distribution system is shown on Figure 6.11. Pipes of 250 mm, 300 mm and 400 mm diameter generally were used to loop through the 3 Year growth horizon areas, and connect to the existing water distribution system. Larger diameter transmission-type mains were also extended into new growth areas where required.

To meet minimum system pressures in the northwest industrial area with flow only supplied from the WR, the 500 mm main on 44 Street in west Lloydminster needs to be extended along 44 St from 70 Ave to 75 Ave and along 75 Ave from 44 St to 52 St. In addition, a new 200 mm pipe is required along 48 Ave from 54 St to 53 St in order to meet the required fire flow in that area.

3 Year Average Day Demand Analysis

For the 3 year growth horizon, the ADD demand is 161L/s (578 m³/hr). The results of the Average Day Demand simulation are shown on Figure 6.11A.

Minimum system pressure is 364 kPa, which is above the minimum required of 273 kPa; this is located at 35 St and west of 67 Ave (ground elevation ~665 m).

Maximum system pressure is 644 kPa, which is below the maximum allowable pressure of 700 kPa; this is located at 47 St and 37 Ave (ground elevation ~ 636 m).

3 Year Peak Hour Demand Analysis

For the 3 year growth horizon, the PHD demand is 482L/s (1734 m³/hr). The results of the Peak Hour Demand simulation are shown on Figure 6.11B.

Minimum system pressure is 318 kPa, which is above the minimum required of 273 kPa; this is located west of 75 Ave and south of 56 St (ground elevation ~664 m).

Maximum pressure is 570 kPa, which is below the maximum allowable pressure of 700 kPa; this is located at 47 St and 37 Ave (ground elevation ~ 636 m).

3 Year Max Day Demand Plus Fire Flow Analysis

For the 3 year growth horizon, the MDD demand is 321L/s (1156 m³/hr). Fire flows are generally met in the 3 year development area. Limited locations within the existing system do not meet the required fire flow under the 3 year demand but are close (within 10% of required fire flow). Most of these are located on AC pipe, which have a calibrated Hazen-Williams value of C = 90 and this low value may affect the fire flows. Given that there is some uncertainty inherent in future demand projections, and since the C value for AC pipe may be revised upwards after the City completes its investigation of system blockages (Section 5.3), no pipe upgrades are proposed for these locations at this time. In addition, some areas are located on private property (i.e. Lakeland College and Mobile Park) and upgrades are not considered for these areas as on-site pipe upgrades by the landowners could improve the private fire flows. Future looping with further development will help improve fire flows for the areas in the north and south of the City.

The results of the Fire Flow simulations are shown on Figure 6.11C (fire flow contours) and Figure 6.11D (locations meeting fire flow requirements).

6.5.4 5 Year Growth Horizon

The future 5 year water distribution system is shown on Figure 6.12. Pipes of 250 mm, 300 mm, and 400 mm diameter generally were used to loop through the 5 Year growth horizon areas, and connect to the existing water distribution system and 3 year growth areas. No additional existing system upgrades are required.

5 Year Average Day Demand Analysis

For the 5 year growth horizon, the ADD demand is 186L/s (668 m³/hr). The results of the Average Day Demand simulation are shown on Figure 6.12A.

Minimum system pressure is 362 kPa, which is above the minimum required of 273; this is located at 35 St and west of 67 Ave (ground elevation ~665 m).

Maximum system pressure is 642 kPa, which is below the maximum allowable pressure of 700 kPa; this is located at 47 St and 37 Ave (ground elevation ~ 636 m).

5 Year Peak Hour Demand Analysis

For the 5 year growth horizon, the PHD demand is 557L/s (2004 m³/hr). The results of the Peak Hour Demand simulation are shown on Figure 6.12B.

Minimum system pressure is 299 kPa, which is above the minimum required of 273 kPa; this is located south of Highway 16 (44 St) at Range Road 13 (ground elevation ~664 m).

Maximum system pressure is 552 kPa, which is below the maximum allowable pressure of 700 kPa; this is located at 47 St and 37 Ave (ground elevation ~ 636 m).



5 Year Max Day Demand Plus Fire Flow Analysis

For the 5 year growth horizon, the MDD demand is 371L/s (1336 m³/hr). Fire flows are generally met in the 5 year development area. As discussed in Section 6.5.3, limited locations within the existing system do not meet fire flows but are close (within 10% of required fire flow). Given that there is some uncertainty inherent in future demand projections, and since the C value for AC pipe may be revised upwards after the City completes its investigation of system blockages (Section 5.3), no pipe upgrades are proposed for these locations at this time. In addition, future looping with further development will help improve fire flows. The results of the fire flow simulations are shown on Figure 6.12C (fire flow contours) and Figure 6.12D (locations meeting fire flow requirements).

6.5.5 10 Year Growth Horizon

The future 10 year water distribution system is shown on Figure 6.13. Pipes of 250 mm, 300 mm and 400 mm diameter generally were used to loop through the 10 Year growth horizon areas, and connect to the existing water distribution system and 3 and 5 year growth areas. Upgrading to the system in the vicinity of the WR is required to minimize headlosses and ensure minimum pressures are met throughout the City. The existing 500 mm main leading out from the West End reservoir needs to be upgraded to a 750 mm or equivalent pipe twinning and the existing 300 mm AC pipe on 43 St extending west from the WR, from about 66 Ave to 62 Ave, will require upgrading to 750 mm.

10 Year Average Day Demand Analysis

For the 10 year growth horizon, the ADD demand is 230L/s (826 m³/hr). The results of the Average Day Demand simulation are shown on Figure 6.13A.

Minimum system pressure is 367 kPa, which is above the minimum required of 273 kPa; this is located at 35 St and west of 67 Ave (ground elevation ~665 m).

Maximum system pressure is 645 kPa, which is below the maximum allowable pressure of 700 kPa; this is located at 47 St and 37 Ave (ground elevation ~ 636 m).

10 Year Peak Hour Demand Analysis

For the 10 year, the PHD demand is 689L/s (2479 m³/hr). The results of the Peak Hour Demand simulation is shown on Figure 6.13B.

Minimum system pressure is 331 kPa, which is above the minimum required of 273 kPa; this is located at west of 75 Ave and south of 56 St (ground elevation ~ 664 m).

Maximum system pressure is 578 kPa, which is below the maximum allowable pressure of 700 kPa; this is located at 47 St and 37 Ave (ground elevation ~ 636 m).

10 Year Max Day Demand Plus Fire Flow Analysis

For the 10 year, the MDD demand is 459L/s (1653 m³/hr). Fire flows are generally met in the 10 year development area. As discussed in Section 6.5.3, limited locations within the existing system do not meet fire flows but are close (within 10% of required fire flow). Given that there is some uncertainty inherent in future demand projections, and since the C value for AC pipe may be revised upwards after the City completes its investigation of system blockages (Section 5.3), no pipe upgrades are proposed for these locations at this time. In addition, future looping with further development will help improve fire flows. The results of the fire flow simulations are shown on Figure 6.13C (fire flow contours) and Figure 6.13D (locations meeting fire flow requirements).

6.5.6 20 Year Growth Horizon

The future 20 year water distribution system is shown on Figure 6.14. Pipes of 250 mm, 300 mm and 400 mm diameter generally were used to loop through the 10 Year growth horizon areas, and connect to the existing water distribution system and 3, 5 and 10 year growth areas.

Upgrading to the system in the vicinity of the WR site is required to minimize head loss and ensure minimum pressures are met throughout the City. The required pipe upgrades are as follows:

Twin the existing 400 mm PVC pipe on 73 Ave from about 43 St to 44 St with a 600 mm pipe.

Twin the existing 500 mm PVC pipe on 44 St from 66 Ave to 70 Ave with a 500 mm pipe.

In addition, a new 200 mm pipe is required along 48 Avenue from 42 St to 41 St in order to meet the required fire flows for that area.

20 Year Average Day Demand Analysis

For the 20 year, the ADD demand is 310L/s (1115 m³/hr). The results of the Average Day Demand simulations are shown on Figure 6.14A.

Minimum system pressure is 351 kPa, which is above the minimum required of 273 kPa; this is located at 44 St and west of 80 Ave (ground elevation ~666 m).

Maximum system pressure is 652 kPa, which is below the maximum allowable pressure of 700 kPa; this is located north of 52 St and east of 40 Ave (ground elevation ~635 m).

20 Year Peak Hour Demand Analysis

For the 20 year, the PHD demand is 929 L/s (3344 m³/hr). The results of the Peak Hour Demand simulations are shown on Figure 6.14B.

Minimum system pressure is 303 kPa, which is above the minimum required of 273 kPa; this is located 44 St and west of 80 Ave (ground elevation ~666 m).

Maximum system pressure is 550 kPa, which is below the maximum allowable pressure of 700 kPa; this is located north of 52 St and east of 40 Ave (ground elevation ~635 m).

Pipe velocities for the 20 year system are shown on Figure 6.14C. Most of the pipes within the system have a velocity of less than 0.50 m/s. Pipes located in the western part of the city have velocities between 1.0 m/s to 2.5 m/s).

20 Year Max Day Demand Plus Fire Flow Analysis

For the 20 year, the MDD demand is 619L/s (2229 m³/hr). Fire flows are generally met in the 20 year development area. As discussed in Section 6.5.3, limited locations within the existing system do not meet fire flows but are close (within 10% of required fire flow). Given that there is some uncertainty inherent in future demand projections, and since the C value for AC pipe may be revised upwards after the City completes its investigation of system blockages (Section 5.3), no pipe upgrades are proposed for these locations at this time. The results of the Fire Flow simulations are shown on Figure 6.14D (fire flow contours) and Figure 6.14E (locations meeting fire flow requirements).

6.6 Future System Upgrading Probable Costs

Probable costs for pipe upgrades, reservoir and distribution pumping expansion, and fill line construction over the next 20 years is provided in Table 6.17. Pipe cost estimates have been provided for the future system upgrades of existing system areas only. Cost estimates for future development on-site water mains

Table 6.17: Future Water System Upgrading Probable Costs (Near Term to 20 Year Horizon)

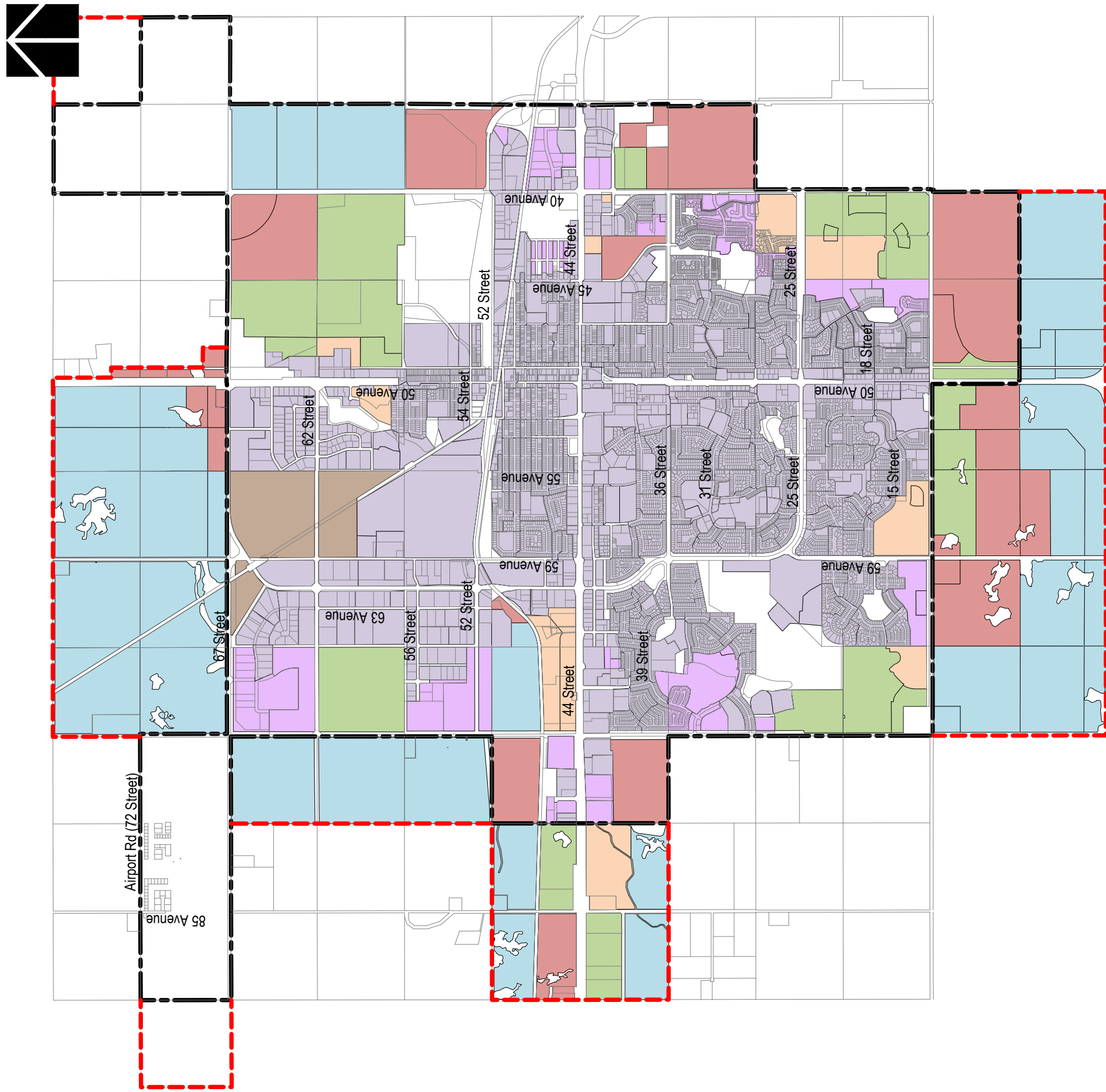
Model From Node (If Applicable)	Model To Node (If Applicable)	Upgrade size/Material	Pipe Upgrade Length (m)	Built Up or Green Field	Address	Unit Cost (\$/m or \$/m ³)	Sub-Total (\$)	Engineering (15%)	Contingency (30%)	Total Cost (\$)	Comments
NEAR FUTURE											
		750 mm, PVC	6310	Mixture (assume 1/3 built up, 2/3 similar to green field)	From 62 Street/50 Avenue to the West End Reservoir	\$1,870	\$11,799,700	\$300,000	\$3,539,910	\$15,640,000	750 mm dedicated fill line, using existing WTP pumps
FUTURE 3 Year											
West End Reservoir Expansion		9850 m ³			West End Reservoir	\$500	included in budget unit rate			\$4,925,000	Expand WR
West End Reservoir Pumping Upgrade		70 L/s			West End Reservoir		included in budget unit rate			\$200,000	Add additional pumping capacity at WR for Peak Hour
J-1196	J-3953	500 mm, PVC	1360	Mainly Green Field	44 St, from 70 Ave to 75 Ave and from 75 Ave at 44 St to 52 St.	\$900	\$1,224,000	\$183,600	\$367,200	\$1,774,800	Extend the 500 mm main on 44 St, in order to meet minimum system pressures during peak hour demand in the northwest industrial area.
J-2131	J-4048	200 mm, PVC	111	Built Up	48 Ave, from 54 St to 53 St	\$1,480	\$164,280	\$24,650	\$49,290	\$238,220	New 200 mm pipe, running north-south is proposed in order to meet the required FF. Increases fire flow from 75 L/s to 146 L/s (100 L/s is required).
FUTURE 5 Year											
West End Reservoir Pumping Upgrade		75 L/s			West End Reservoir		included in budget unit rate			\$200,000	Add additional pumping capacity at WR for Peak Hour
FUTURE 10 Year											
WR	J-304	750 mm, PVC	160	Built Up	At the WR discharge	\$3,010	\$481,600	\$72,240	\$144,480	\$698,320	Upgrade the 500 main leading out of the WR with 750 mm (or equivalent pipe twinning)
J-304	J-78	750 mm, PVC	207	Built Up	43 St, from about 62 Ave to 66 Ave	\$3,010	\$623,070	\$93,470	\$186,930	\$903,470	Upgrading in the vicinity of the WR is required to minimize headloss and ensure minimum system pressures are met during peak hour demand.
West End Reservoir Expansion		11000 m ³			West End Reservoir	\$750	included in budget unit rate			\$8,250,000	Includes demolition of the existing above ground reservoir and building new expansion on its site
West End Reservoir Pumping Upgrade		132 L/s			West End Reservoir		included in budget unit rate			\$500,000	Add additional pumping capacity at WR for Peak Hour
FUTURE 20 Year											
West End Reservoir Expansion		13000 m ³			West End Reservoir	\$1,000	included in budget unit rate			\$13,000,000	Expand WR - New Reservoir location to be determined. Modeling based upon expansion at or near existing reservoir.
West End Reservoir Pumping Upgrade		240 L/s			West End Reservoir		included in budget unit rate			\$500,000	Add additional pumping capacity at WR for Peak Hour
J-78	J-77	600 mm, PVC	162	Built Up	73 Ave, from 43 St to 44 St	\$2,730	\$442,260	\$66,340	\$132,680	\$641,280	Twin the existing 400 mm PVC with 600 mm PVC to minimize headloss and ensure minimum system pressures are met during peak hour demand.
J-77	J-1196	500 mm, PVC	520	Built Up	44 St, from 66 Ave to 70 Ave	\$2,480	\$1,289,600	\$193,440	\$386,880	\$1,869,920	Twin the existing 500 mm PVC with 500 mm PVC to minimize headloss and ensure minimum system pressures are met during peak hour demand.
J-290	J-2322	200 mm, PVC	99	Built Up	48 Ave, from 42 St to 41 St	\$1,480	\$146,520	\$21,980	\$43,960	\$212,460	New 200 mm pipe, running north-south is proposed in order to meet the required FF. Increases fire flow from 224 L/s to 289 L/s (225 L/s is required).

Notes:

1. FF = Fire flow
WR = West End Reservoir
2. Pipe length is based on the model scaled length.
3. Cost estimates are conceptual and are in 2015 dollars. Where possible, rates are based on historical costs provided by the City of Lloydminster.



were not provided as these are subject to detail design and will be part of the developers' cost. The cost estimates provided are in 2015 dollars and include engineering (15%) and contingency (30%) but does not include GST. Note that these cost estimates are conceptual, based on a conceptual level of analysis and are subject to review at detail design.

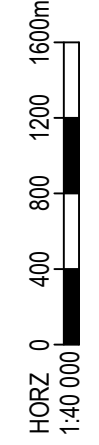


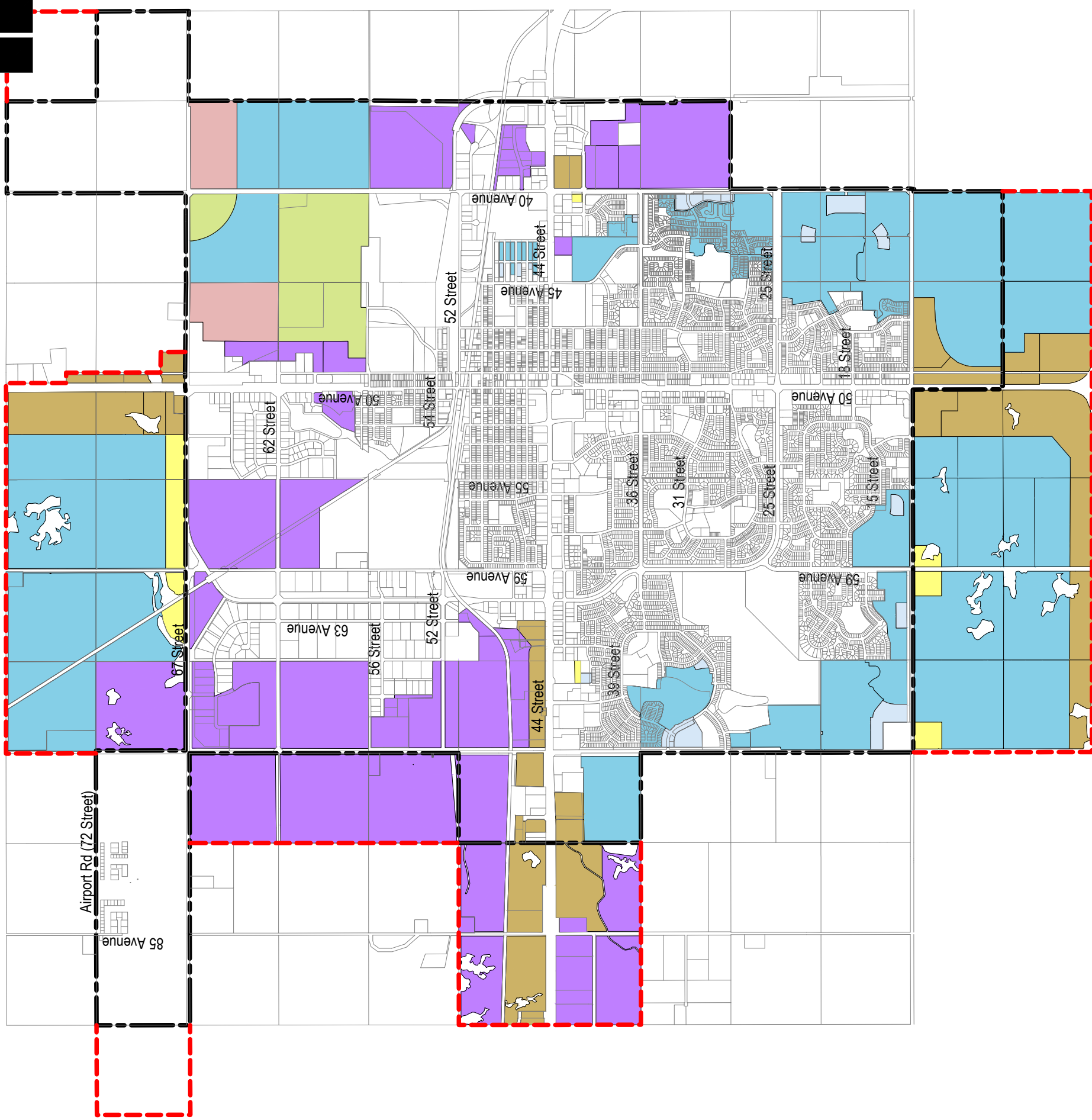
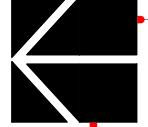
Legend

- GROWTH HORIZON**
- Existing Development
 - 3 Year
 - 5 Year
 - 10 Year
 - 20 Year
 - 40 Year
 - >40 Year

- City Boundary
- Proposed Annexation Area








NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.





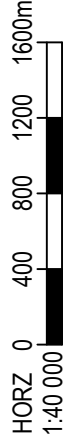
Legend

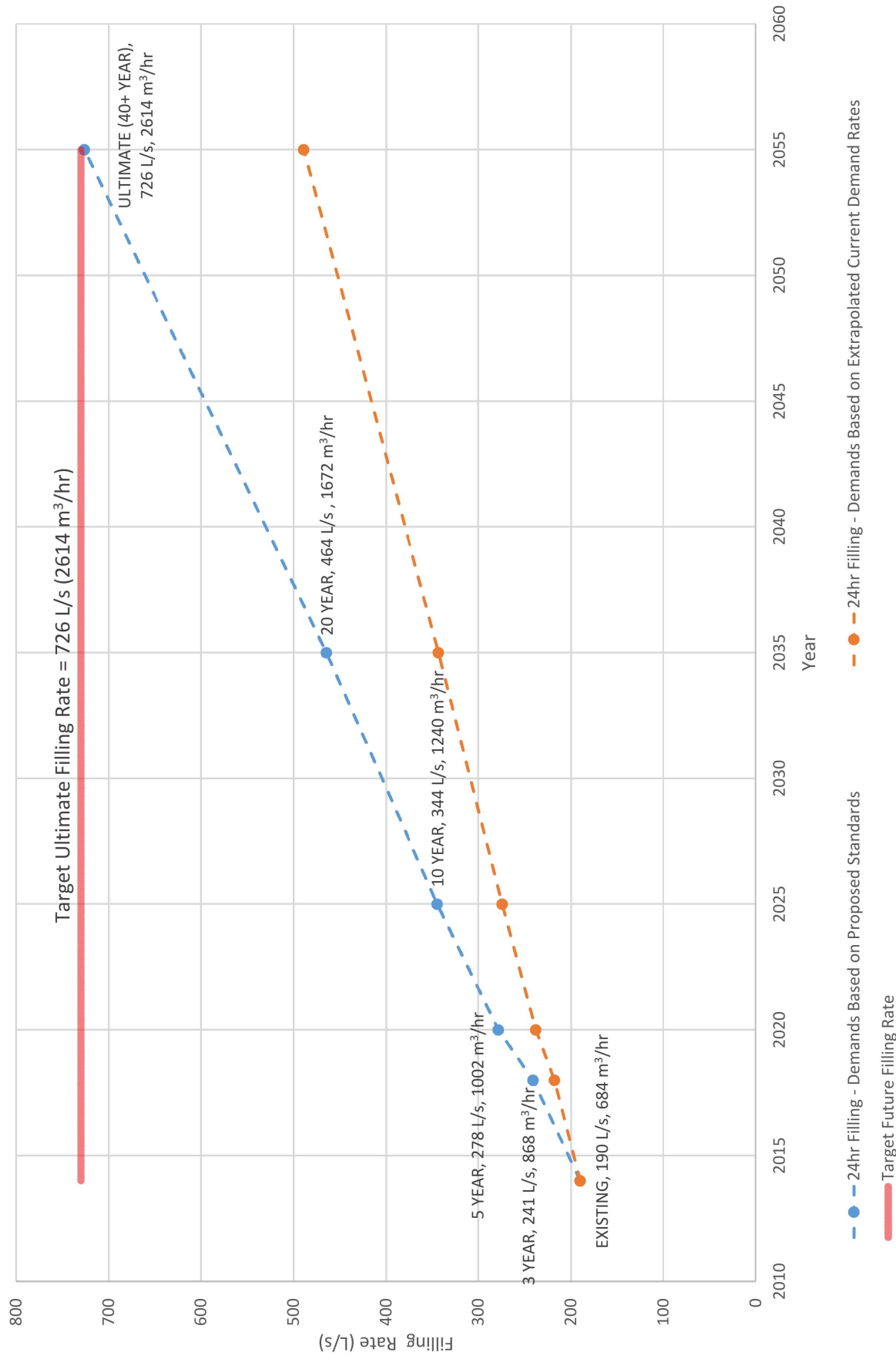
LAND USE

-  Residential MF
-  Residential
-  Other Utility
-  Other Parks
-  Industrial
-  Commercial HWY
-  Commercial

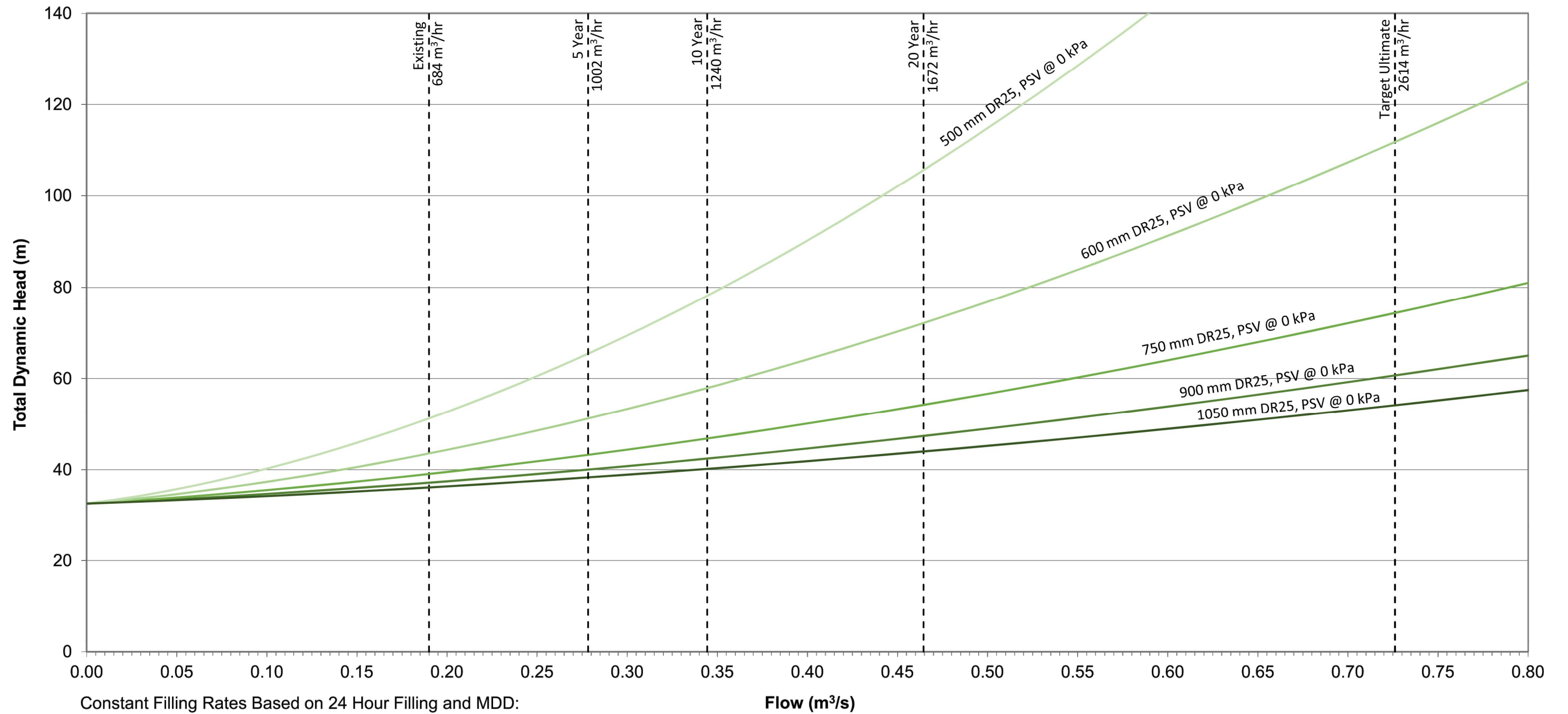
-  City Boundary
-  Proposed Annexation Area

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.





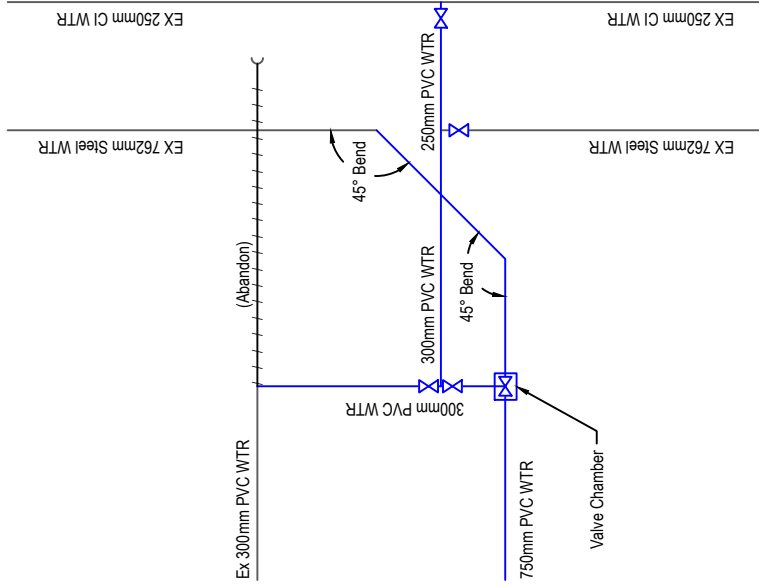
Wai Cheung / Apr. 28, 16 / J:\142001\4228_Lloydminster Water Master Plan\02_CADD\20_Drafting\2016 REVISED FIGURES\Figure 6.4.dwg



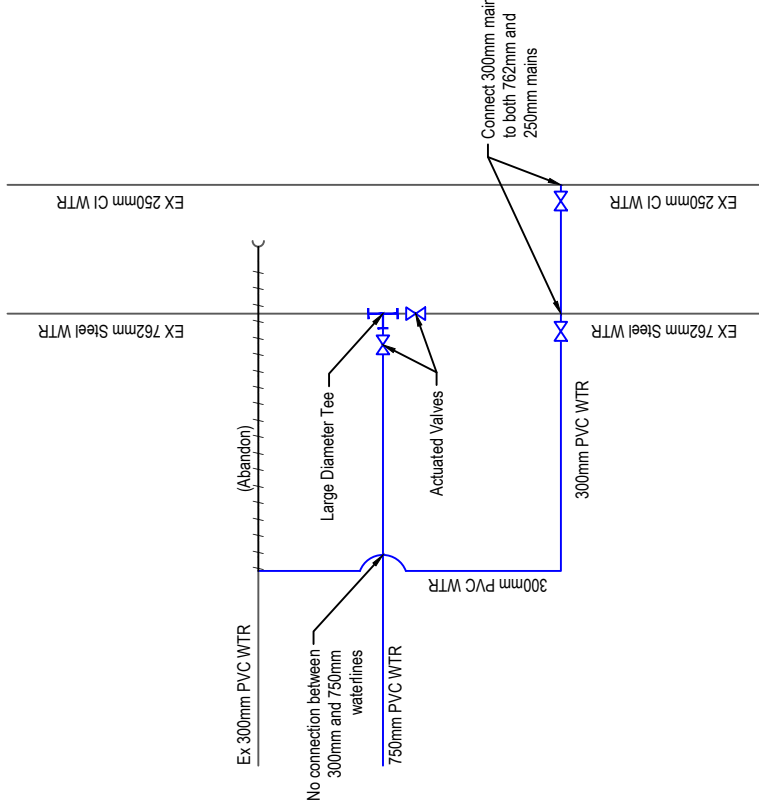
Constant Filling Rates Based on 24 Hour Filling and MDD:

- Existing (2014): Q = 0.190 m³/s (684 m³/hr)
- 5 Year: Q = 0.278 m³/s (1002 m³/hr)
- 10 Year: Q = 0.344 m³/s (1240 m³/hr)
- 20 Year: Q = 0.464 m³/s (1672 m³/hr)
- Target Ultimate: Q = 0.726 m³/s (2614 m³/hr)

Dedicated Fill Line Length (new construction) = 6.31 km
Existing 400/762/500 Pipe Length = 1.01 km

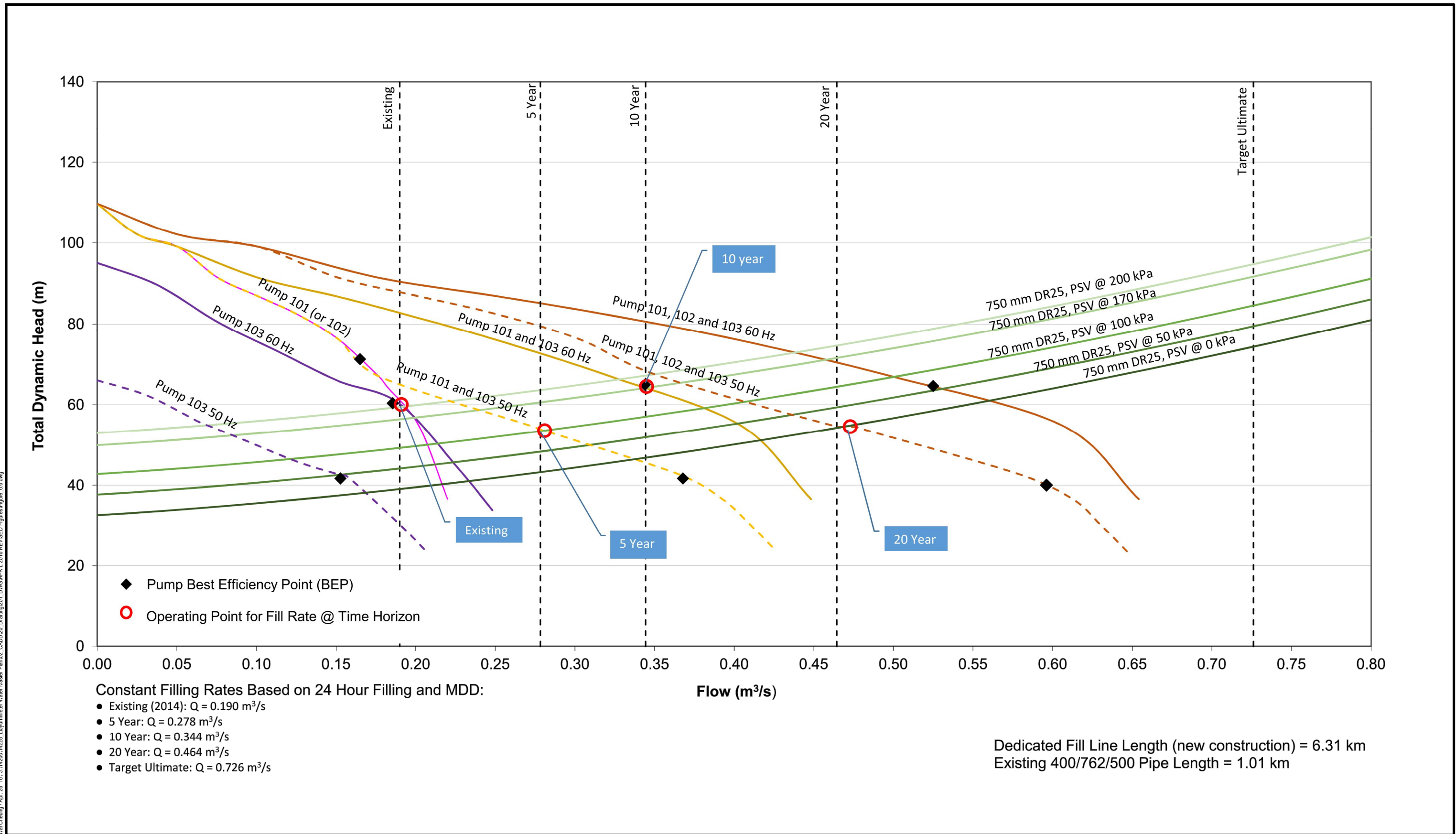


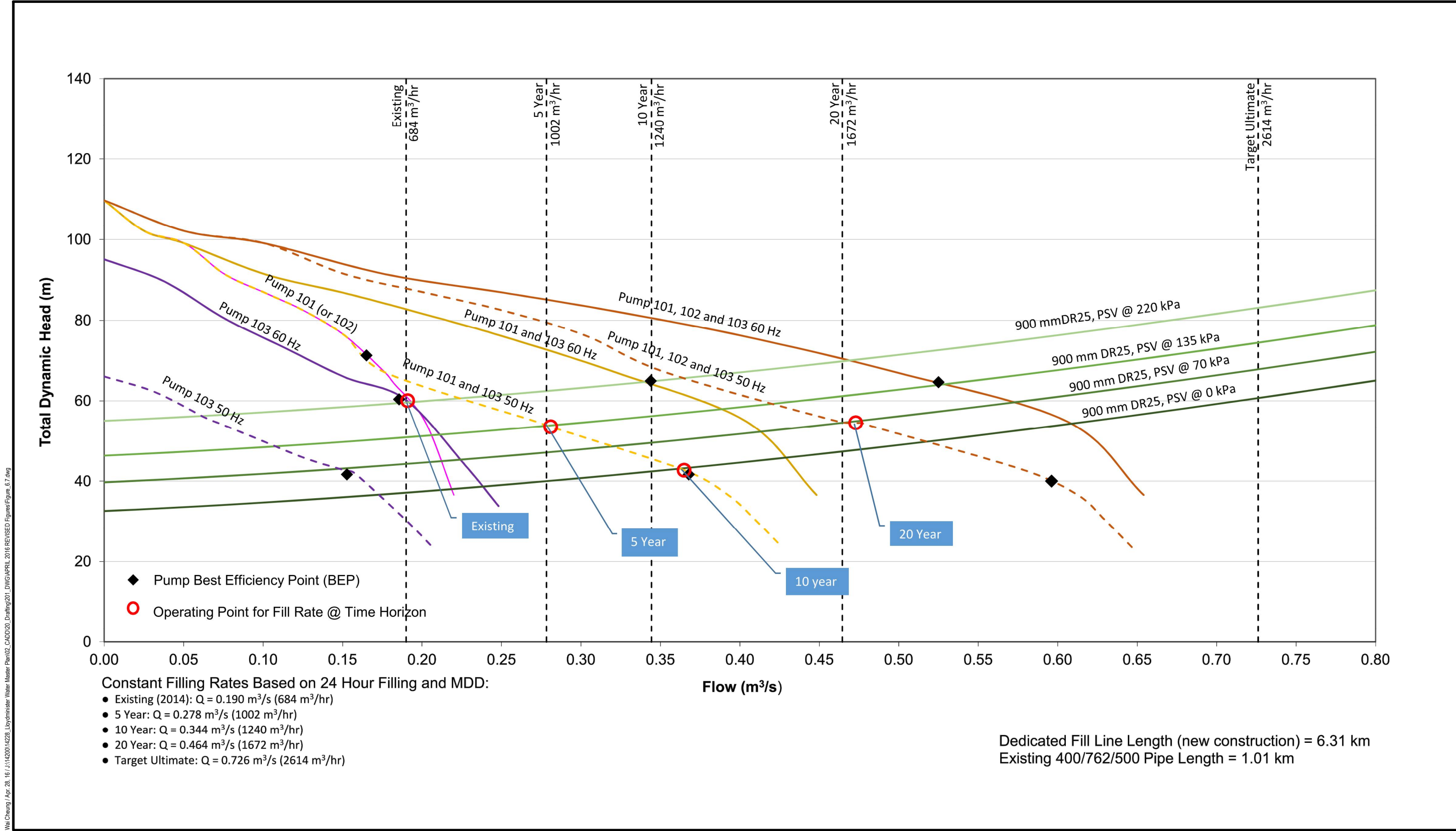
2014 SELECT ENGINEERING DEDICATED WATER SUPPLY MAIN DESIGN (SCHEMATIC)



CURRENT MASTER PLAN PROPOSED CONCEPT (SCHEMATIC)

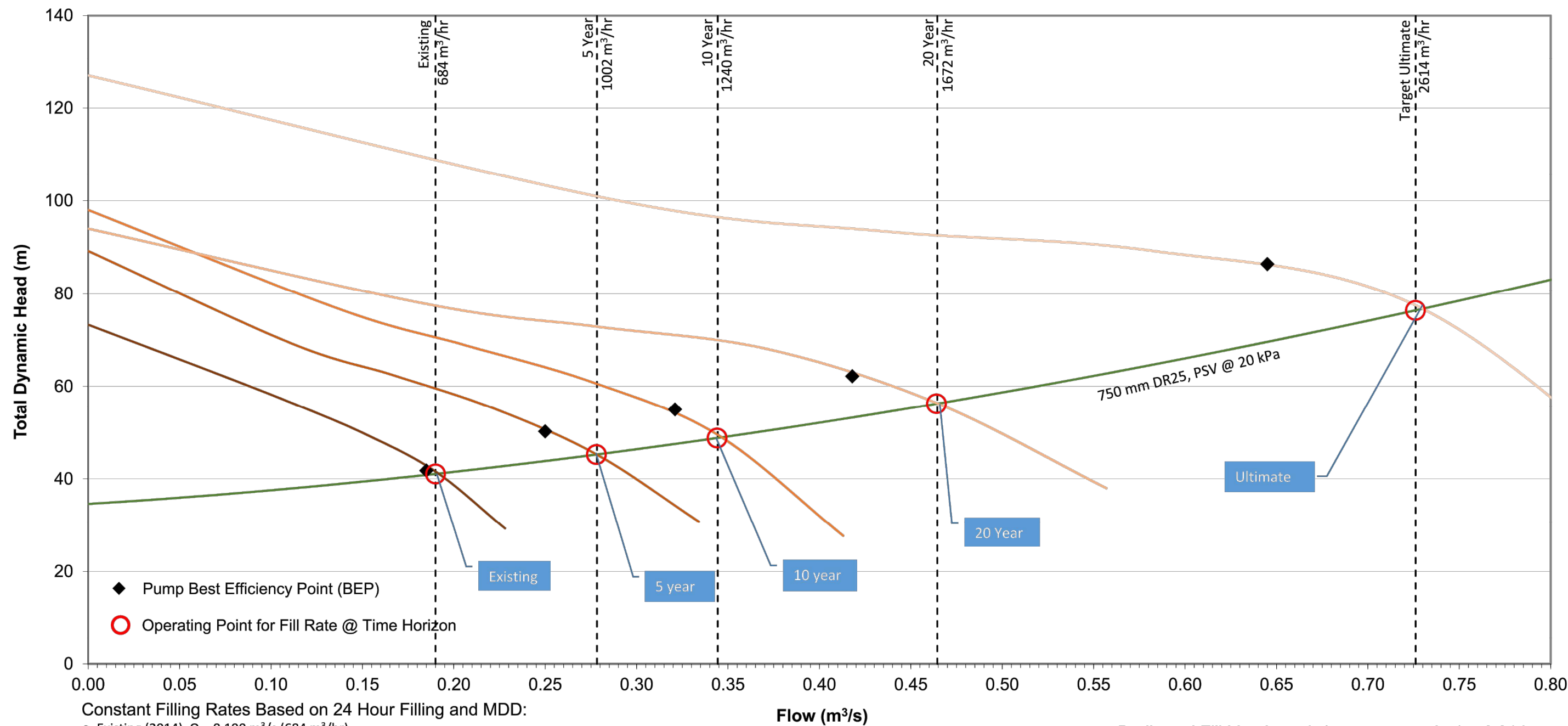
Wai Cheung / Apr. 28. 16 / J:\142001\4228_Lloydminster Water Master Plan\02_CADD\20_Drafting\2016_REVISED_Figures\Figure_6.6.dwg





Wai Cheung / Apr. 28. 16 / J:\142001\4228_Lloydminster Water Master Plan\02_CADD\20_Drafting\2016 REVISED FIGURES\Figure 6.7.dwg

Wai Cheung / Apr. 28, 16 / J:\1420014228_Lloydminster Water Master Plan\02_CADD\20_Drafting\2016 REVISED Figures\Figure 6.8.dwg

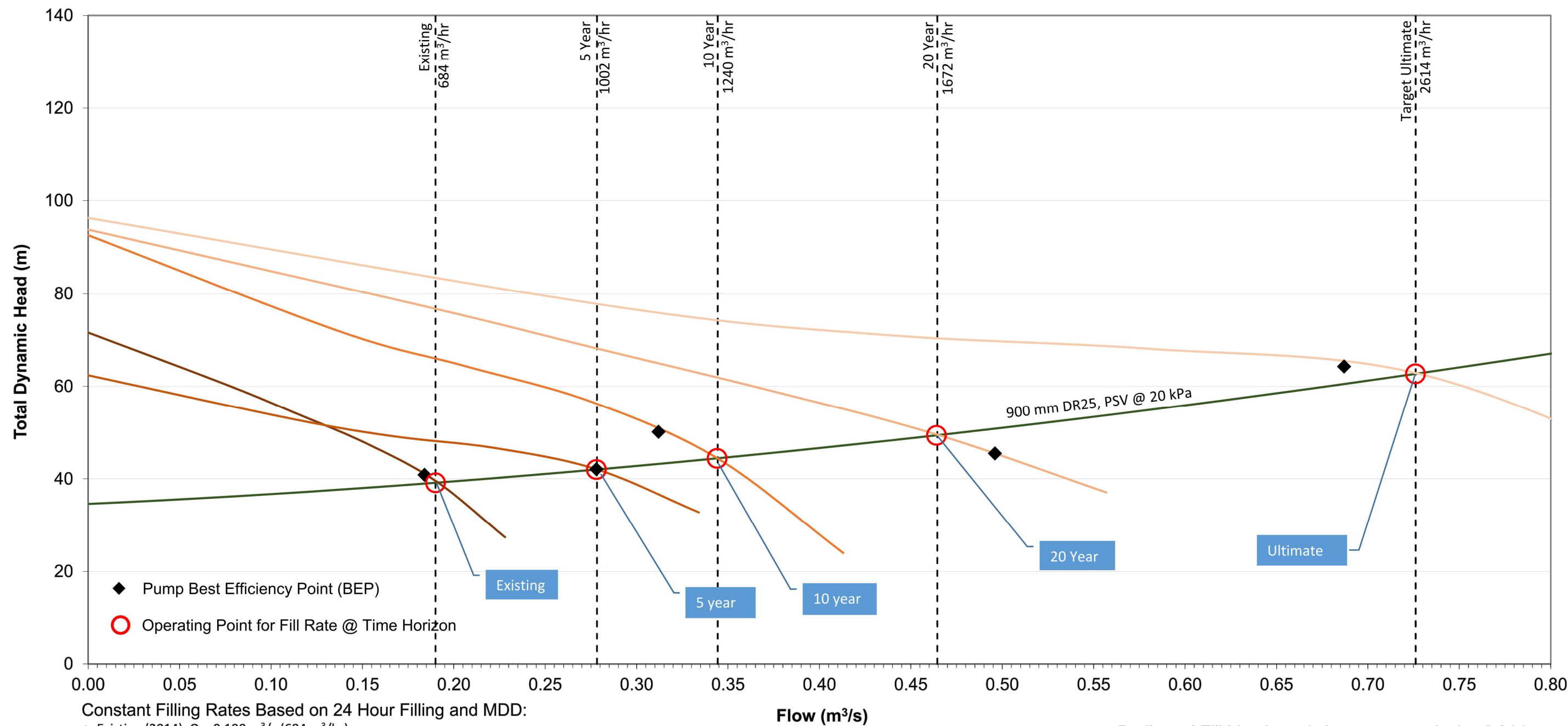


Constant Filling Rates Based on 24 Hour Filling and MDD:

- Existing (2014): $Q = 0.190 \text{ m}^3/\text{s}$ (684 m^3/hr)
- 5 Year: $Q = 0.278 \text{ m}^3/\text{s}$ (1002 m^3/hr)
- 10 Year: $Q = 0.344 \text{ m}^3/\text{s}$ (1240 m^3/hr)
- 20 Year: $Q = 0.464 \text{ m}^3/\text{s}$ (1672 m^3/hr)
- Target Ultimate: $Q = 0.726 \text{ m}^3/\text{s}$ (2614 m^3/hr)

Dedicated Fill Line Length (new construction) = 6.31 km
Existing 400/762/500 Pipe Length = 1.01 km

Wai Cheung / Apr. 28, 16 / J:\1420014228_Lloydminster Water Master Plan\02_CADD\20_Drafting\2016 REVISED Figures\Figure 6.9.dwg



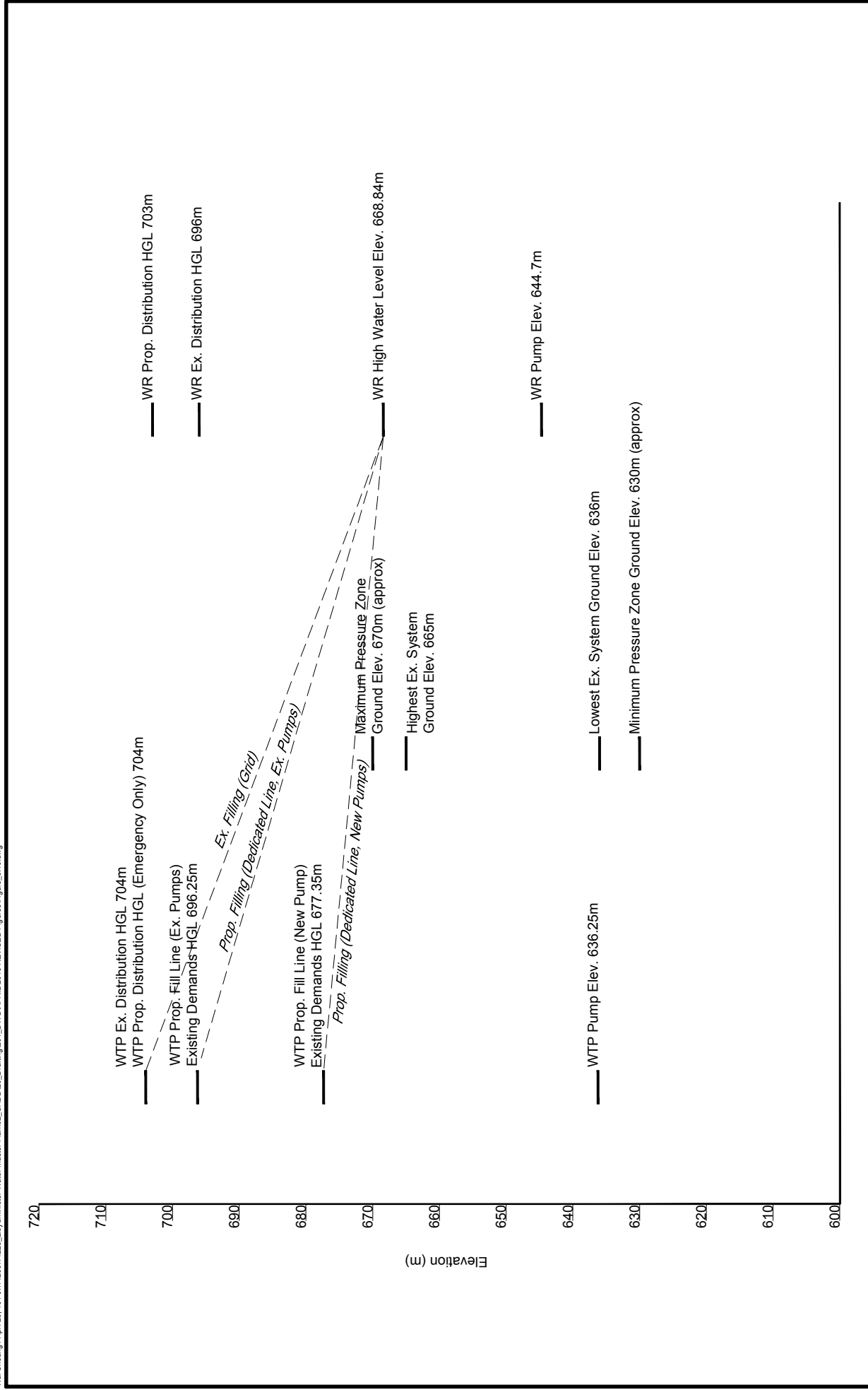
- Constant Filling Rates Based on 24 Hour Filling and MDD:
- Existing (2014): Q = 0.190 m³/s (684 m³/hr)
 - 5 Year: Q = 0.278 m³/s (1002 m³/hr)
 - 10 Year: Q = 0.344 m³/s (1240 m³/hr)
 - 20 Year: Q = 0.464 m³/s (1672 m³/hr)
 - Target Ultimate: Q = 0.726 m³/s (2614 m³/hr)

Dedicated Fill Line Length (new construction) = 6.31 km
Existing 400/762/500 Pipe Length = 1.01 km

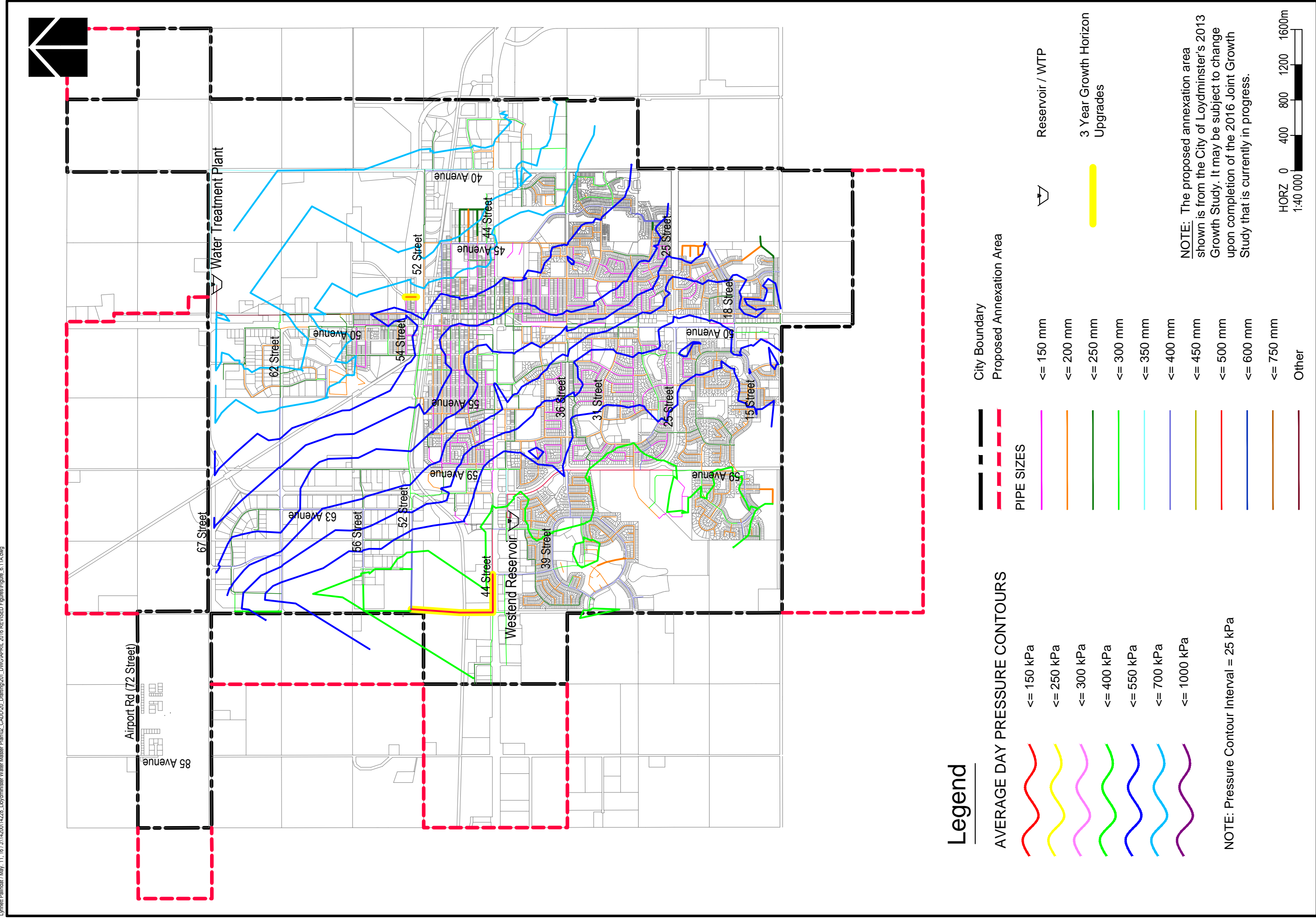


CITY OF LLOYDMINSTER
WATER MASTER PLAN
SYSTEM CURVES FOR 900mm DEDICATED FILL LINE
WITH NEW DEDICATED PUMPING FROM WTP

Figure 6.9







Legend

AVERAGE DAY PRESSURE CONTOURS

- <= 150 kPa
- <= 250 kPa
- <= 300 kPa
- <= 400 kPa
- <= 550 kPa
- <= 700 kPa
- <= 1000 kPa

NOTE: Pressure Contour Interval = 25 kPa

- City Boundary
- Proposed Annexation Area

PIPE SIZES

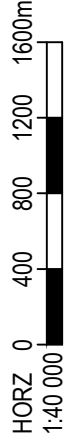
- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other



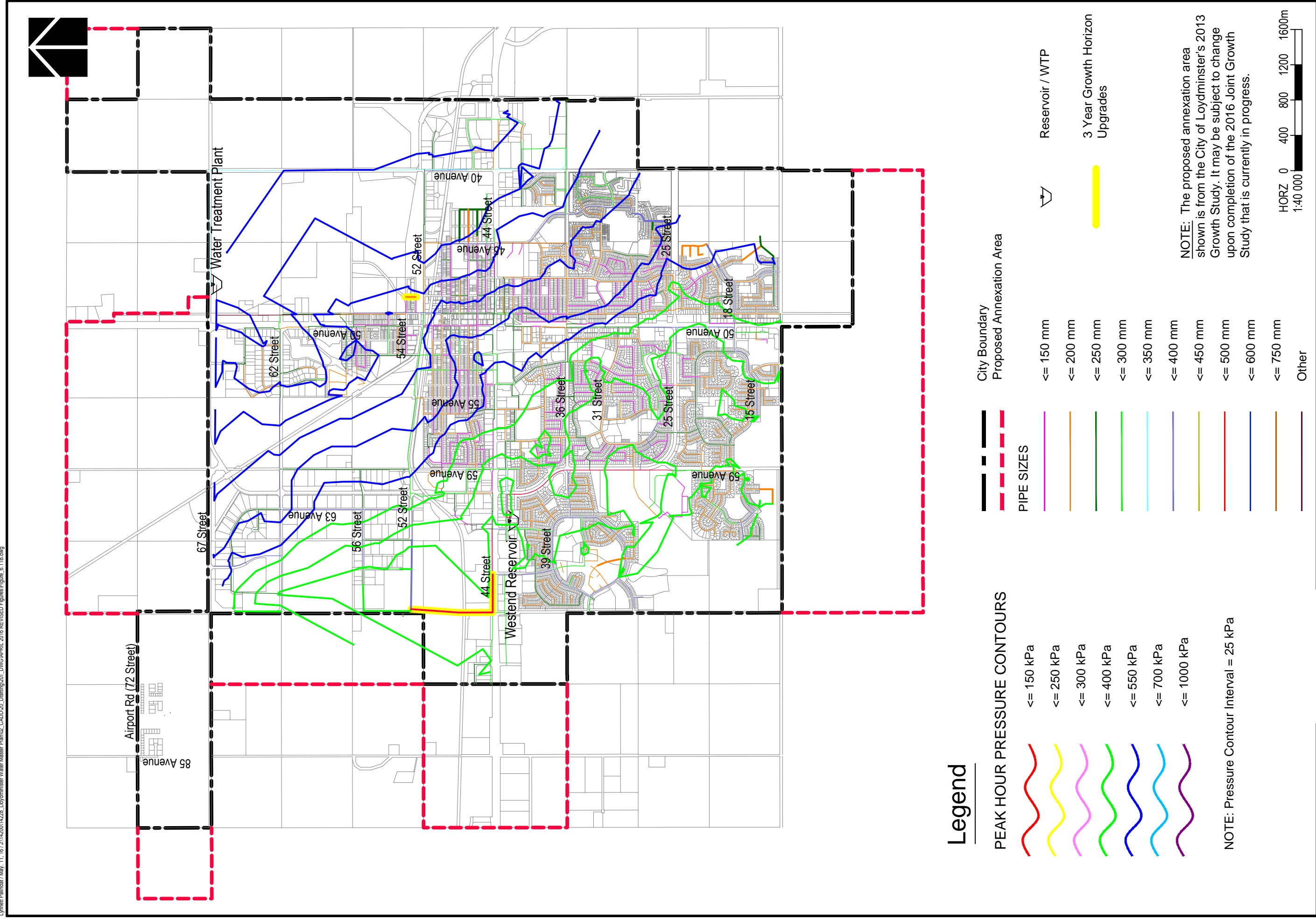
Reservoir / WTP



3 Year Growth Horizon Upgrades



NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.



Legend

PEAK HOUR PRESSURE CONTOURS

- <= 150 kPa
- <= 250 kPa
- <= 300 kPa
- <= 400 kPa
- <= 550 kPa
- <= 700 kPa
- <= 1000 kPa

NOTE: Pressure Contour Interval = 25 kPa

City Boundary Proposed Annexation Area

PIPE SIZES

- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other



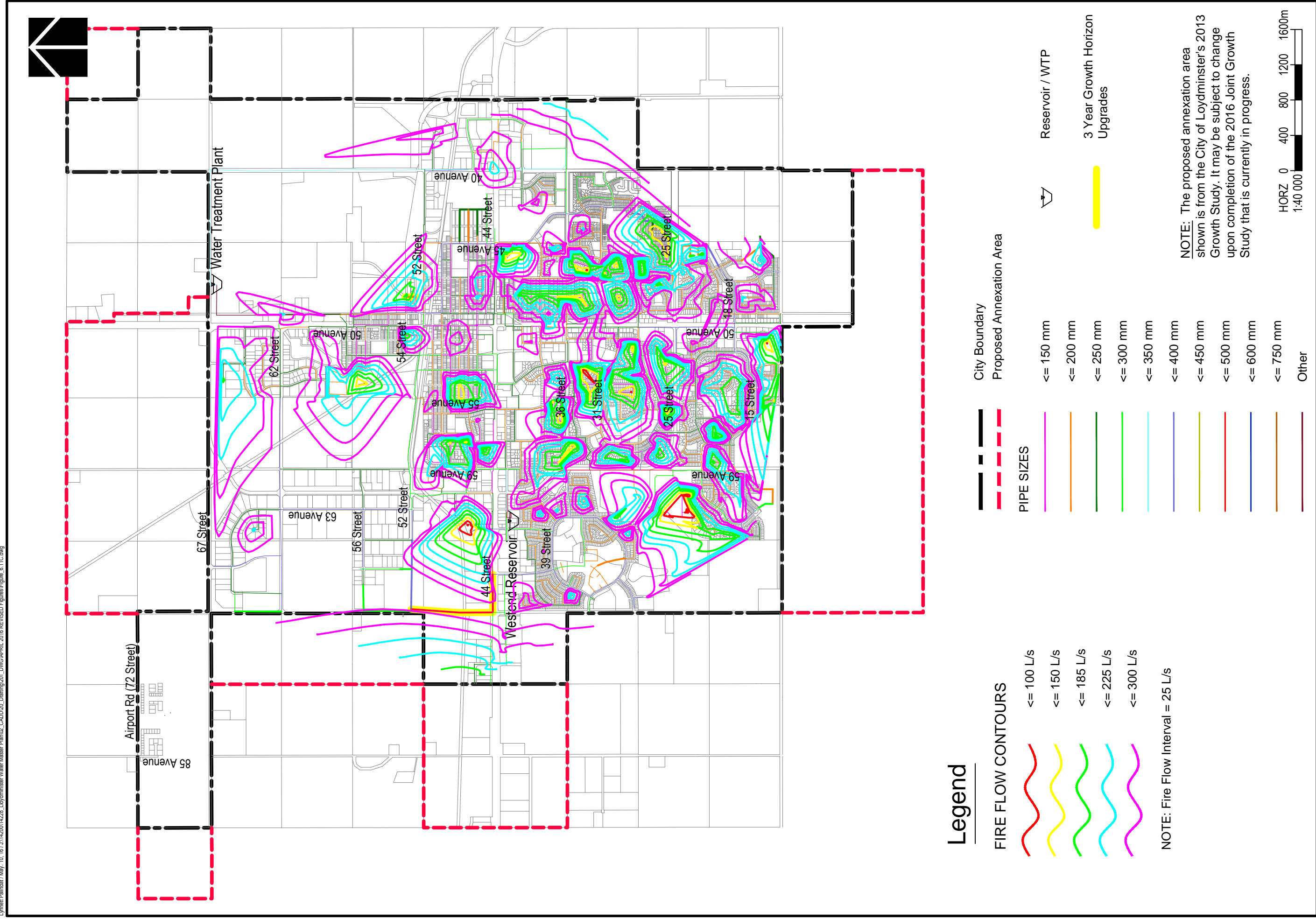
Reservoir / WTP



3 Year Growth Horizon
Upgrades

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.





Legend

FIRE FLOW CONTOURS

- <= 100 L/s
- <= 150 L/s
- <= 185 L/s
- <= 225 L/s
- <= 300 L/s

NOTE: Fire Flow Interval = 25 L/s

- City Boundary
- Proposed Annexation Area

PIPE SIZES

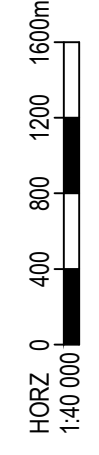
- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other



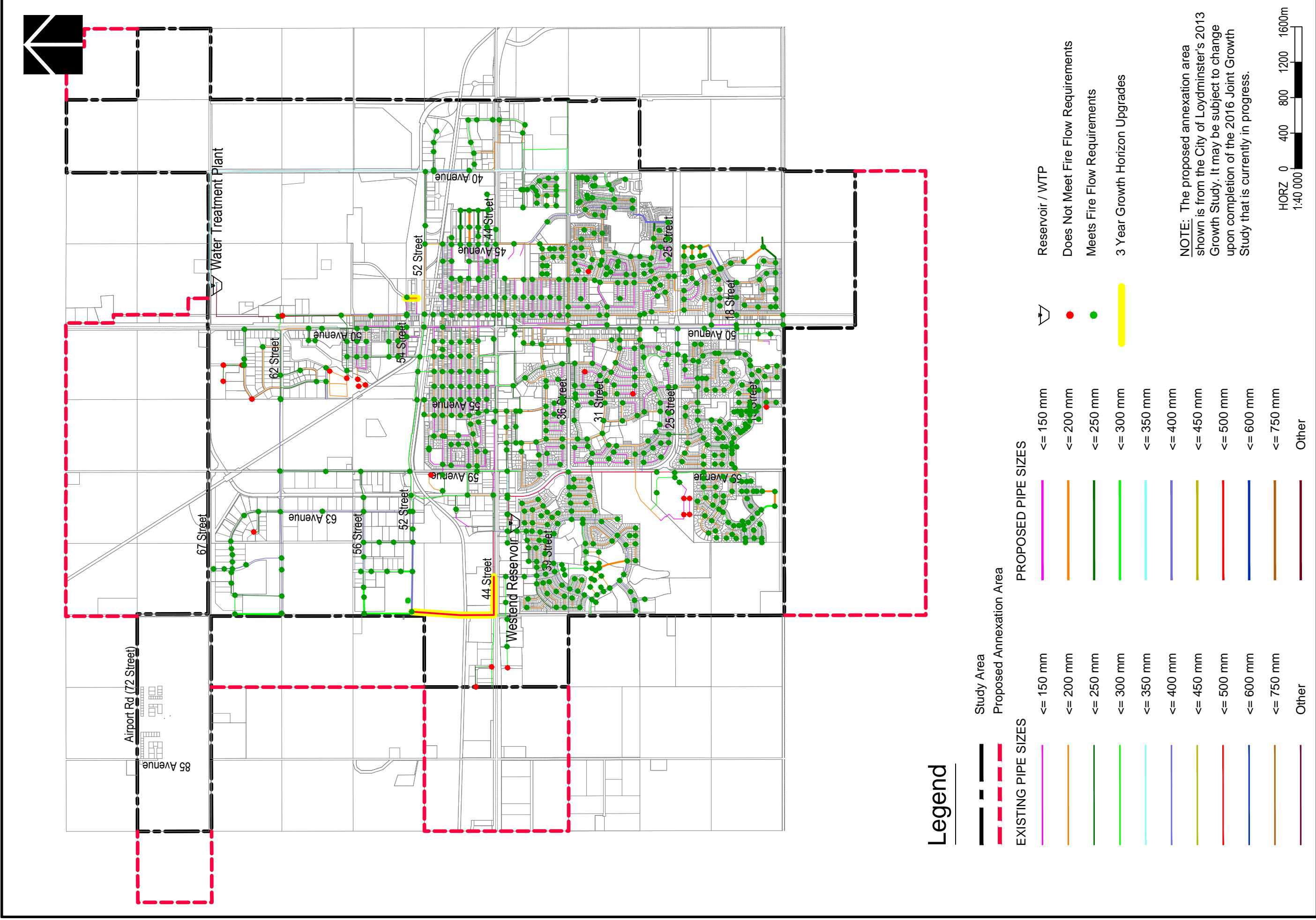
Reservoir / WTP



3 Year Growth Horizon Upgrades



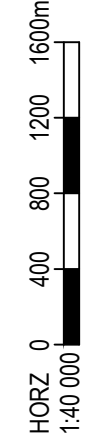
NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.

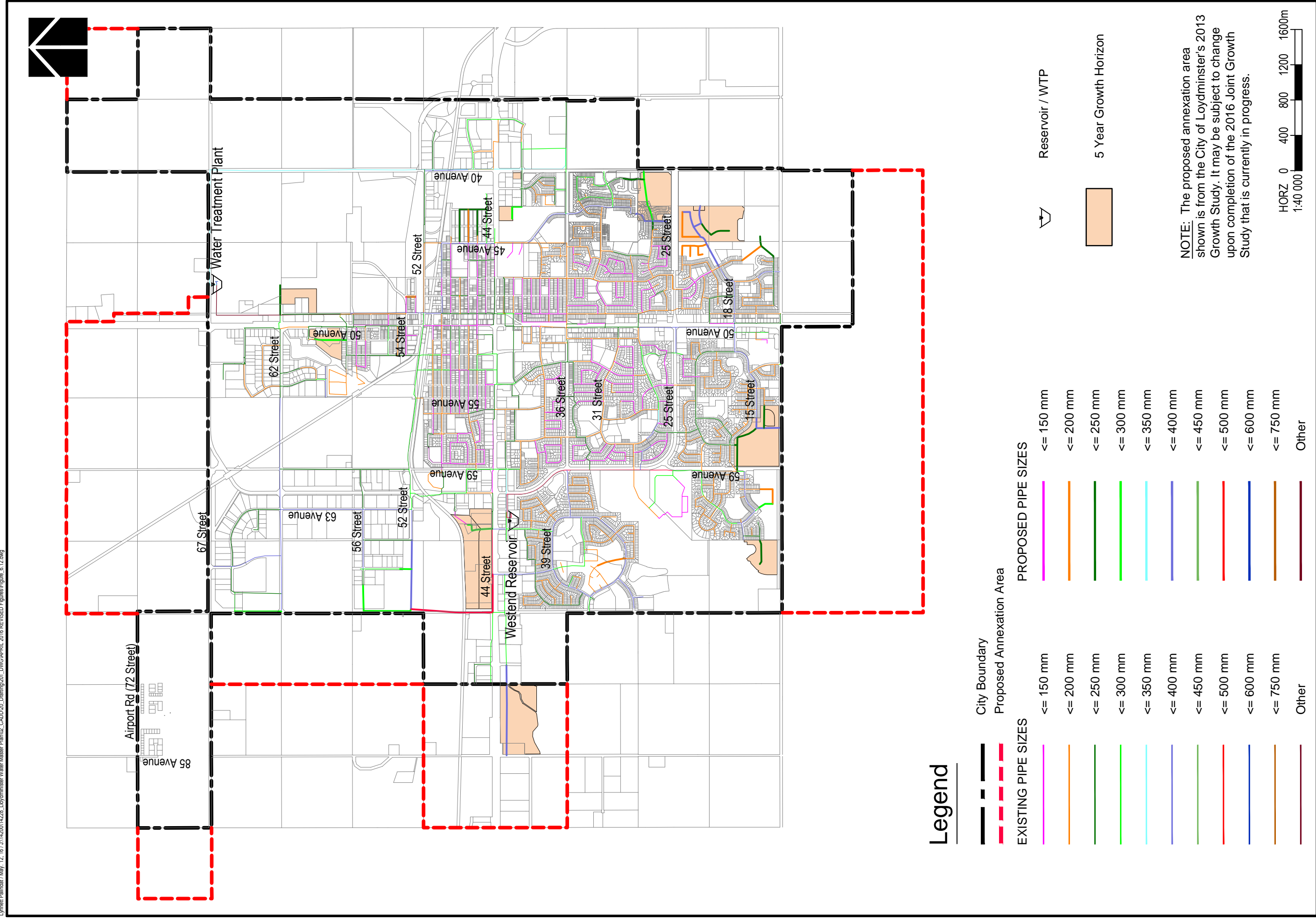


Legend

	Study Area		Proposed Annexation Area		Reservoir / WTP
	<= 150 mm		<= 150 mm		Does Not Meet Fire Flow Requirements
	<= 200 mm		<= 200 mm		Meets Fire Flow Requirements
	<= 250 mm		<= 250 mm		3 Year Growth Horizon Upgrades
	<= 300 mm		<= 300 mm		
	<= 350 mm		<= 350 mm		
	<= 400 mm		<= 400 mm		
	<= 450 mm		<= 450 mm		
	<= 500 mm		<= 500 mm		
	<= 600 mm		<= 600 mm		
	<= 750 mm		<= 750 mm		
	Other		Other		

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.





Legend

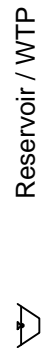
- City Boundary
- Proposed Annexation Area

EXISTING PIPE SIZES

- ≤ 150 mm
- ≤ 200 mm
- ≤ 250 mm
- ≤ 300 mm
- ≤ 350 mm
- ≤ 400 mm
- ≤ 450 mm
- ≤ 500 mm
- ≤ 600 mm
- ≤ 750 mm
- Other

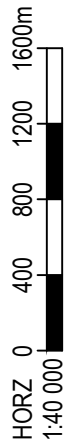
PROPOSED PIPE SIZES

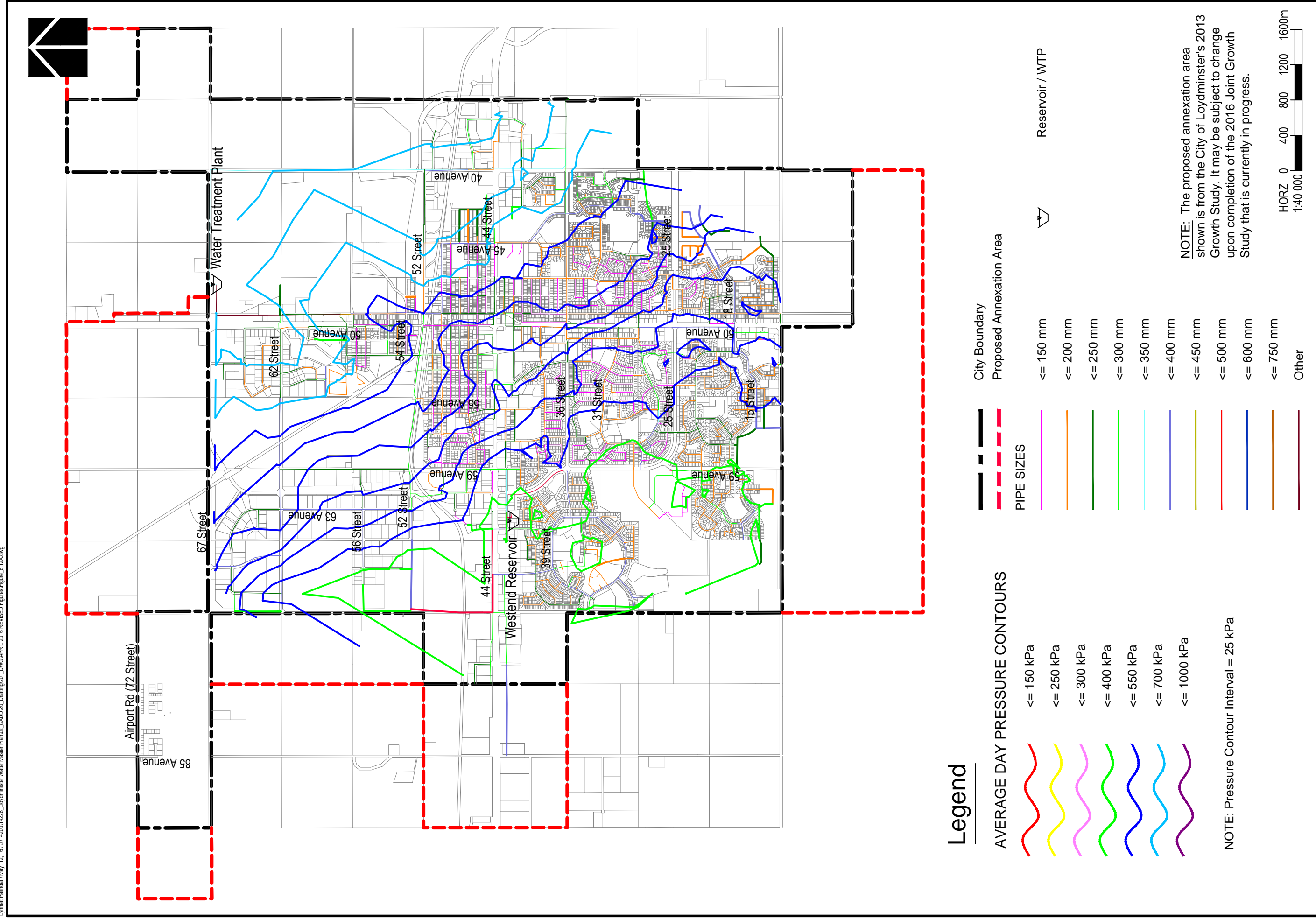
- ≤ 150 mm
- ≤ 200 mm
- ≤ 250 mm
- ≤ 300 mm
- ≤ 350 mm
- ≤ 400 mm
- ≤ 450 mm
- ≤ 500 mm
- ≤ 600 mm
- ≤ 750 mm
- Other



- Reservoir / WTP
- 5 Year Growth Horizon

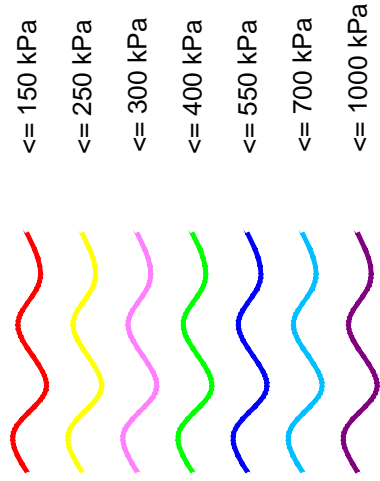
NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.





Legend

AVERAGE DAY PRESSURE CONTOURS



NOTE: Pressure Contour Interval = 25 kPa

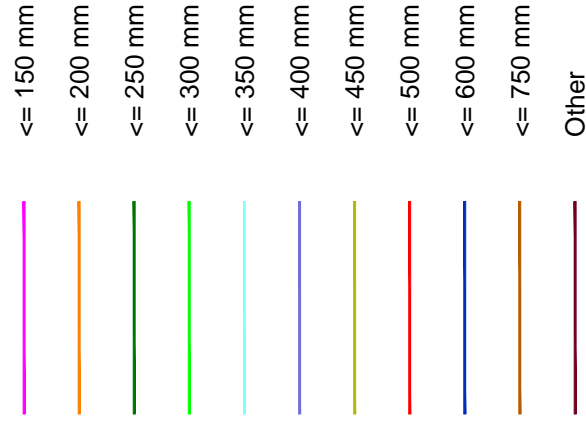


City Boundary



Proposed Annexation Area

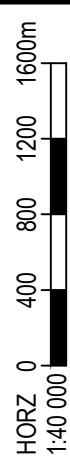
PIPE SIZES

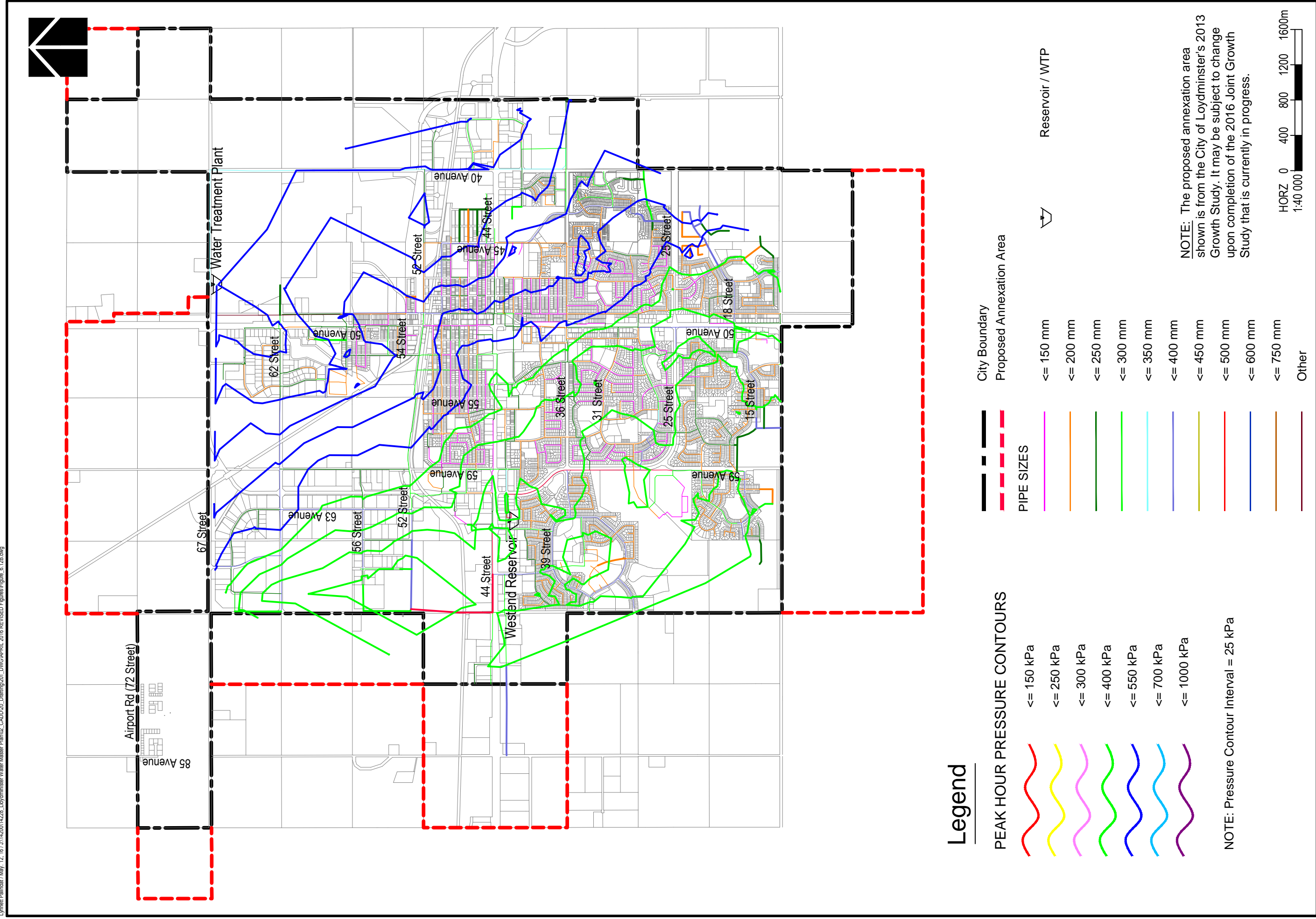


Reservoir / WTP



NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.





Legend

PEAK HOUR PRESSURE CONTOURS

- <= 150 kPa
- <= 250 kPa
- <= 300 kPa
- <= 400 kPa
- <= 550 kPa
- <= 700 kPa
- <= 1000 kPa

NOTE: Pressure Contour Interval = 25 kPa

- City Boundary
- Proposed Annexation Area

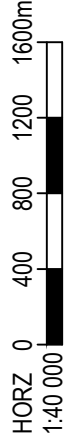
PIPE SIZES

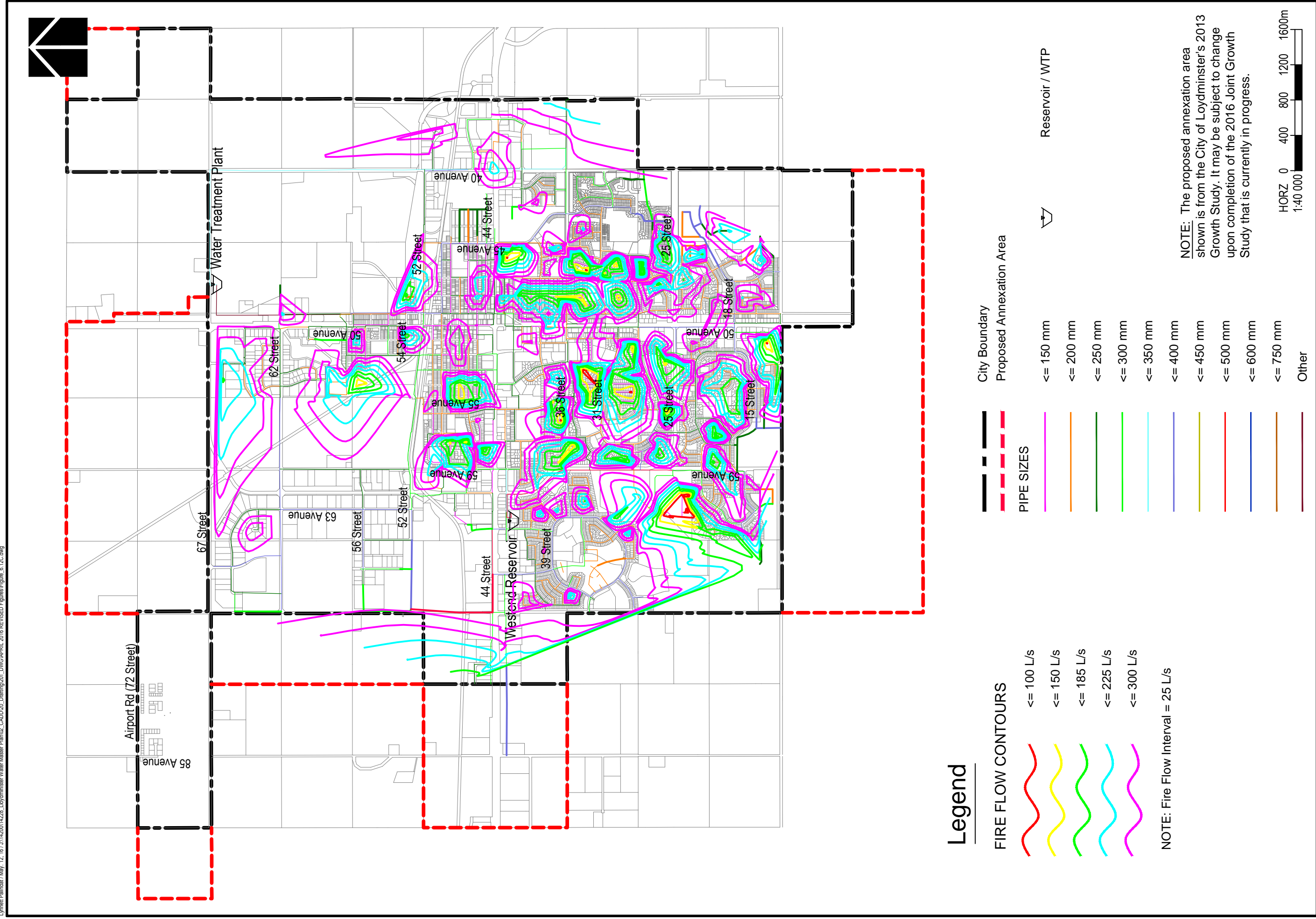
- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other



Reservoir / WTP

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.





Legend

FIRE FLOW CONTOURS

- <= 100 L/s
- <= 150 L/s
- <= 185 L/s
- <= 225 L/s
- <= 300 L/s

NOTE: Fire Flow Interval = 25 L/s

- City Boundary
- Proposed Annexation Area

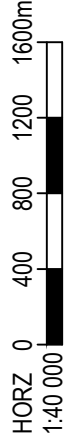
PIPE SIZES

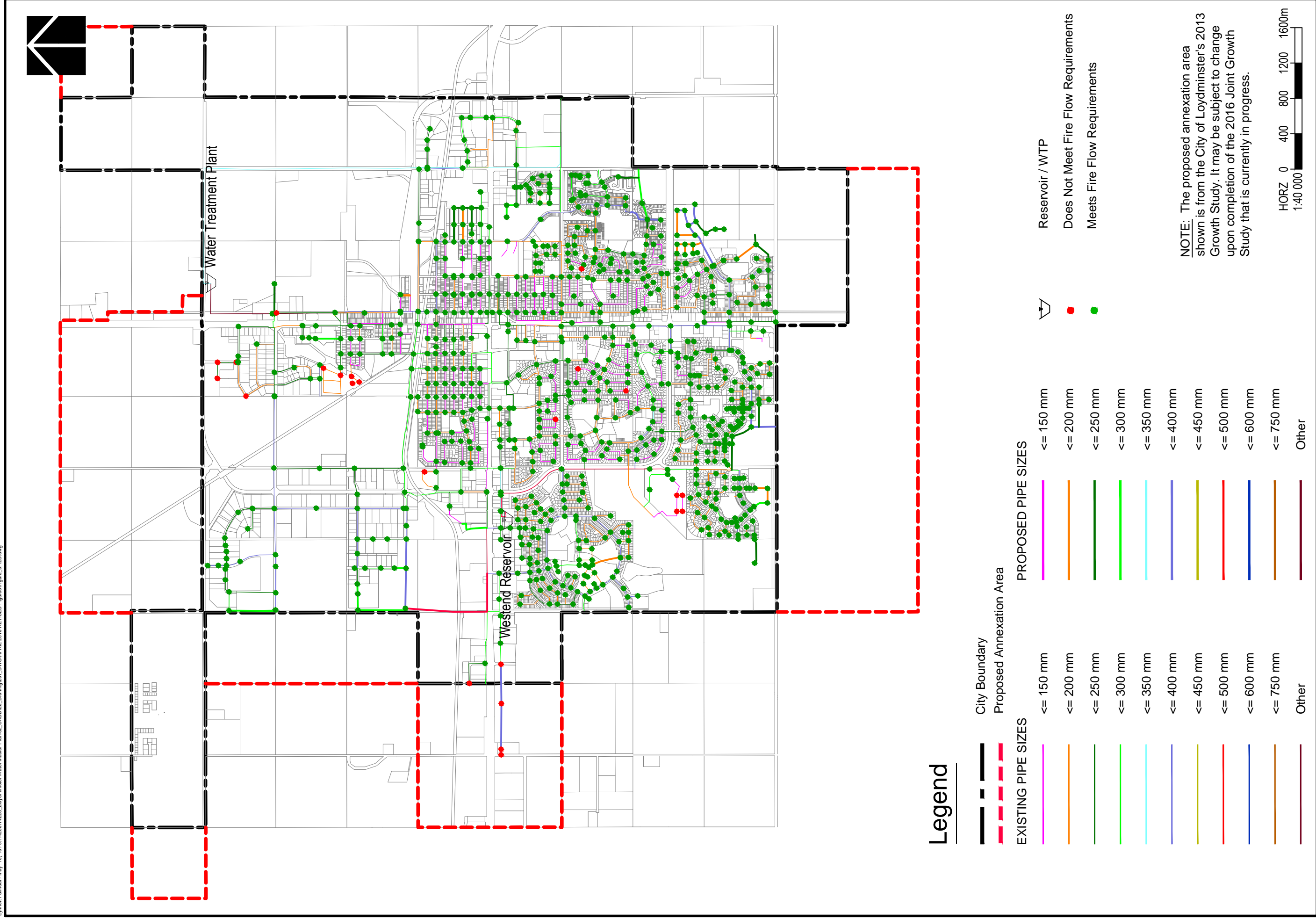
- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other



Reservoir / WTP

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.



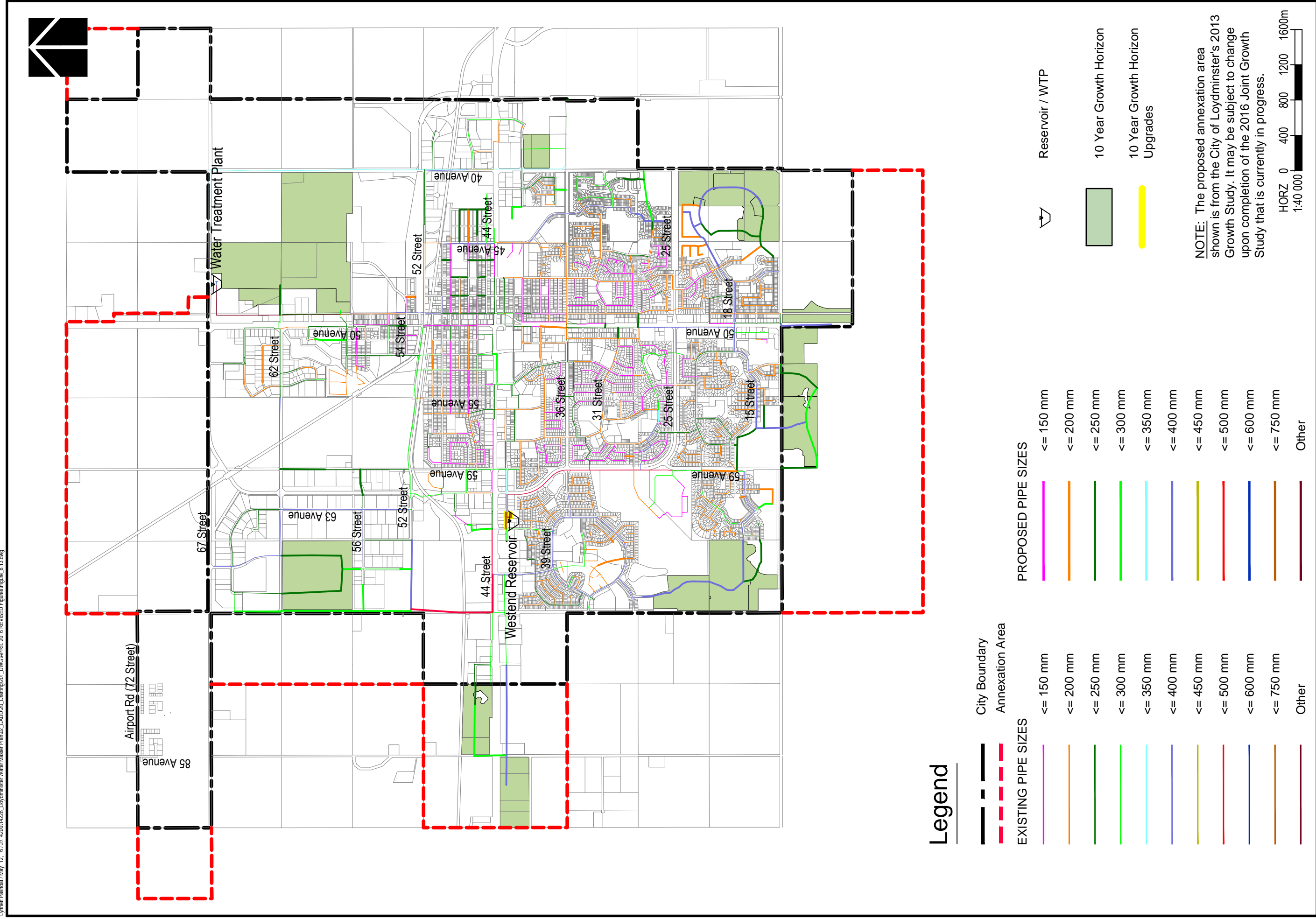


Legend

- | | | | | | |
|----------------------------|---------------|-----------|--------------------------|-----------|--------------------------------------|
| | City Boundary | | Proposed Annexation Area | | Reservoir / WTP |
| EXISTING PIPE SIZES | | <= 150 mm | | <= 200 mm | Does Not Meet Fire Flow Requirements |
| | | <= 200 mm | | <= 250 mm | Meets Fire Flow Requirements |
| | | <= 250 mm | | <= 300 mm | |
| | | <= 300 mm | | <= 350 mm | |
| | | <= 350 mm | | <= 400 mm | |
| | | <= 400 mm | | <= 450 mm | |
| | | <= 450 mm | | <= 500 mm | |
| | | <= 500 mm | | <= 600 mm | |
| | | <= 600 mm | | <= 750 mm | |
| | | <= 750 mm | | Other | |

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.

HORZ 0 400 800 1200 1600m
1:40 000



Legend

- City Boundary
- Annexation Area

EXISTING PIPE SIZES

- ≤ 150 mm
- ≤ 200 mm
- ≤ 250 mm
- ≤ 300 mm
- ≤ 350 mm
- ≤ 400 mm
- ≤ 450 mm
- ≤ 500 mm
- ≤ 600 mm
- ≤ 750 mm
- Other

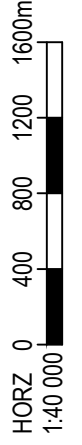
PROPOSED PIPE SIZES

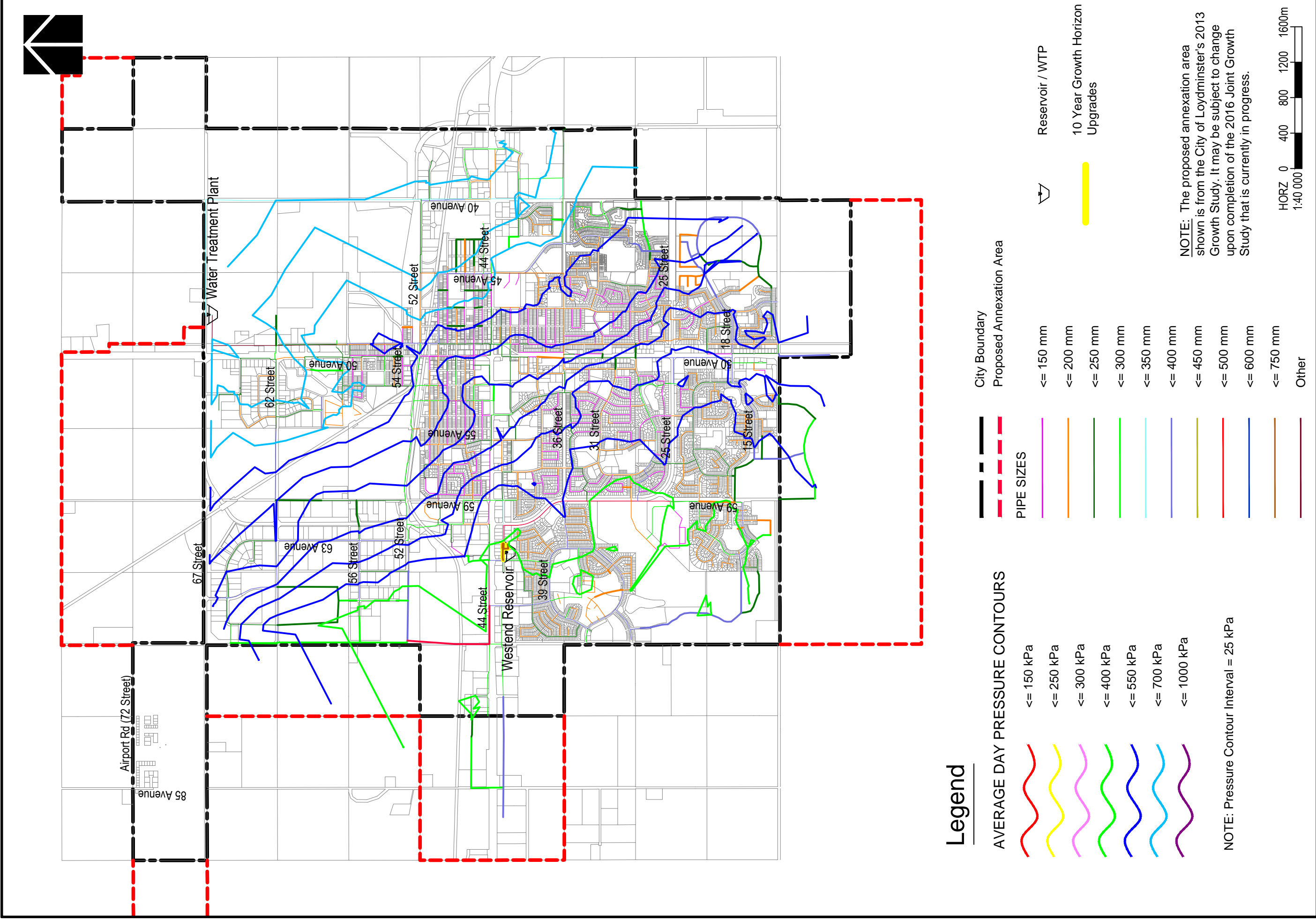
- ≤ 150 mm
- ≤ 200 mm
- ≤ 250 mm
- ≤ 300 mm
- ≤ 350 mm
- ≤ 400 mm
- ≤ 450 mm
- ≤ 500 mm
- ≤ 600 mm
- ≤ 750 mm
- Other

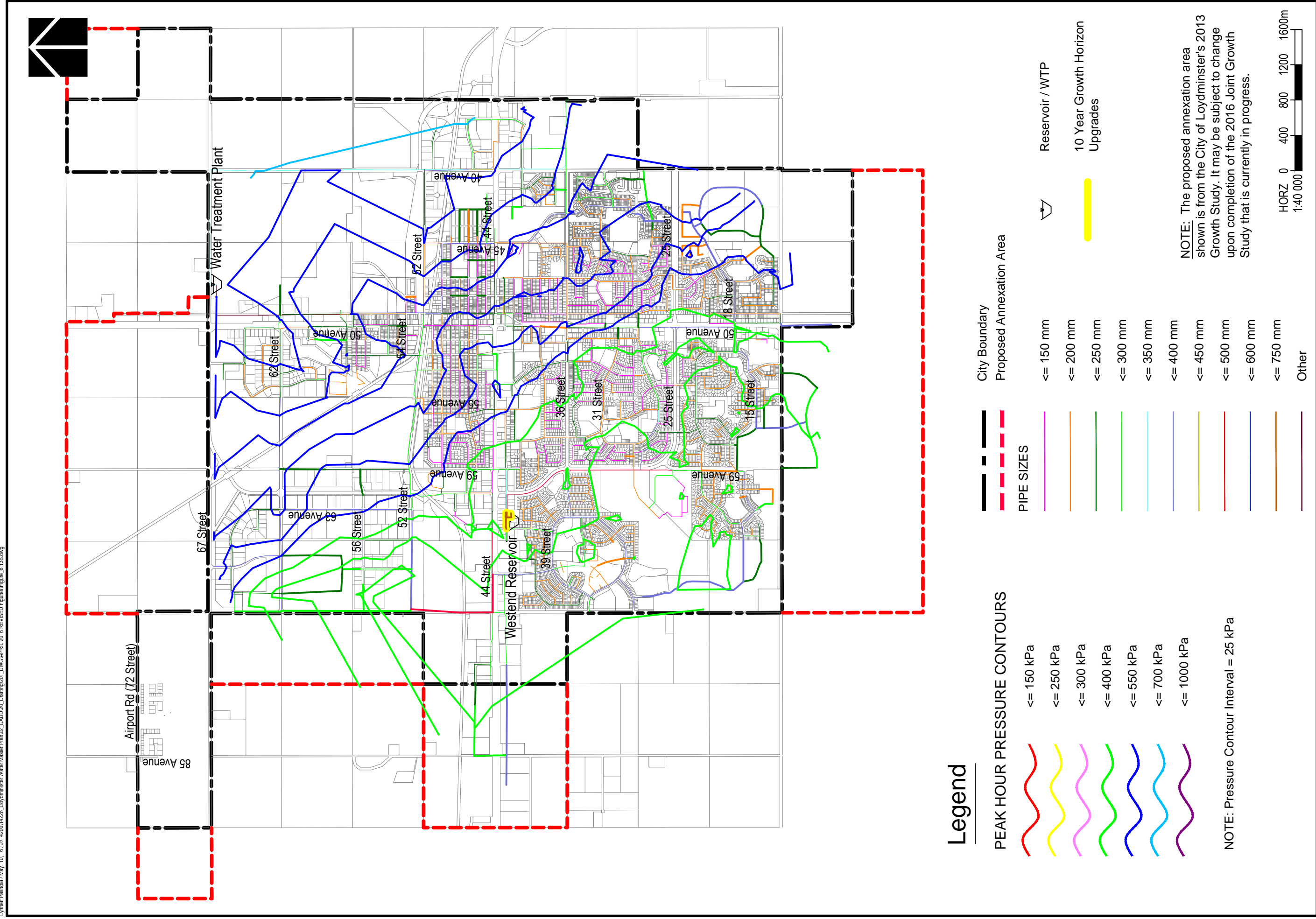
Reservoir / WTP

- 10 Year Growth Horizon
- 10 Year Growth Horizon Upgrades

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.

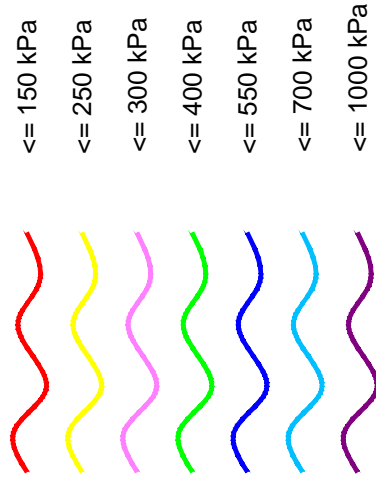






Legend

PEAK HOUR PRESSURE CONTOURS

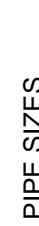


NOTE: Pressure Contour Interval = 25 kPa

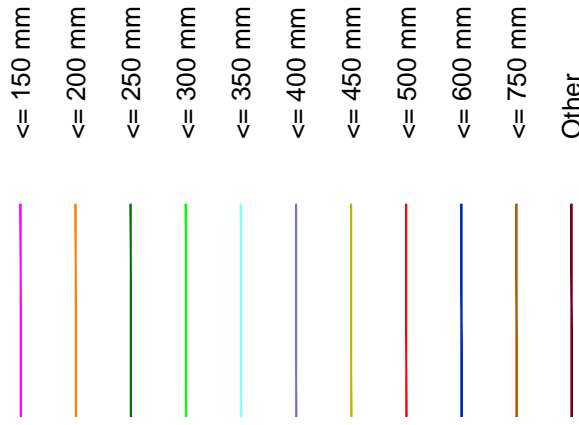
City Boundary



Proposed Annexation Area



PIPE SIZES



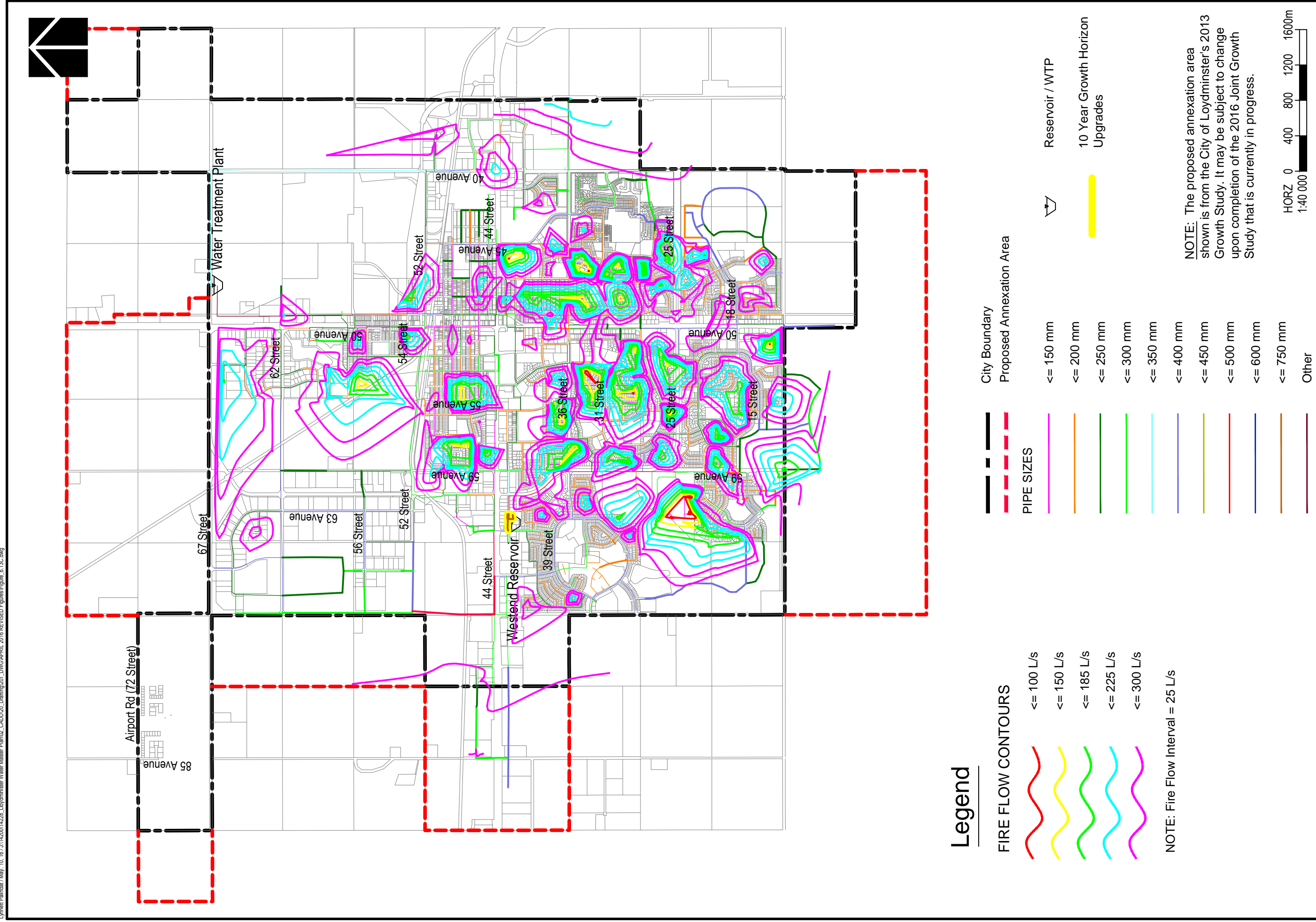
Reservoir / WTP



10 Year Growth Horizon Upgrades



NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.



Legend

FIRE FLOW CONTOURS

- <= 100 L/s
- <= 150 L/s
- <= 185 L/s
- <= 225 L/s
- <= 300 L/s

NOTE: Fire Flow Interval = 25 L/s

- City Boundary
- Proposed Annexation Area

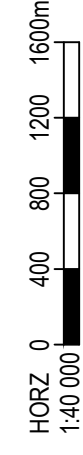
PIPE SIZES

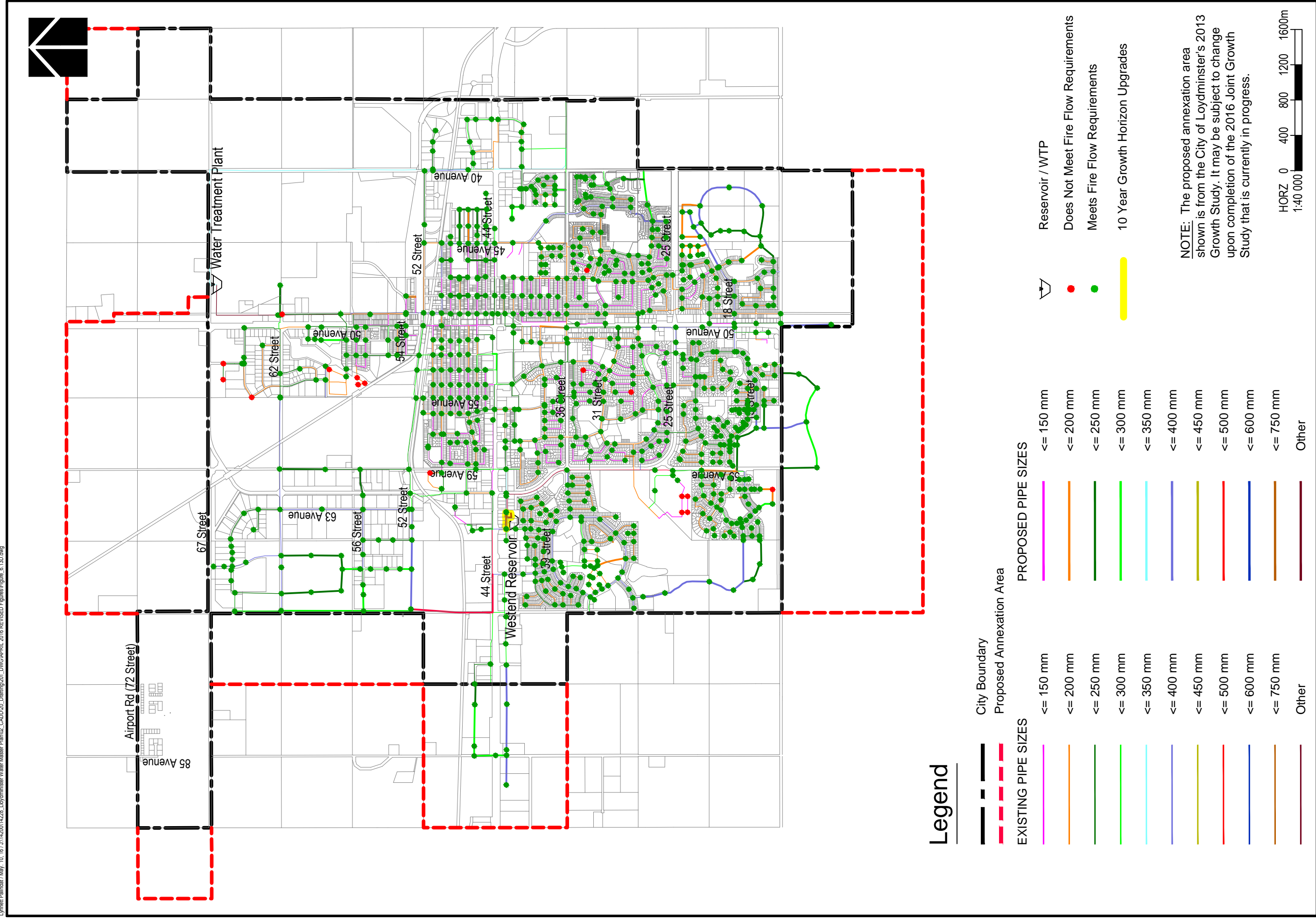
- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other



Reservoir / WTP
10 Year Growth Horizon Upgrades

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.

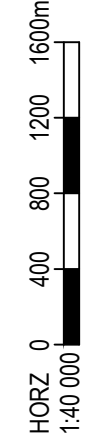


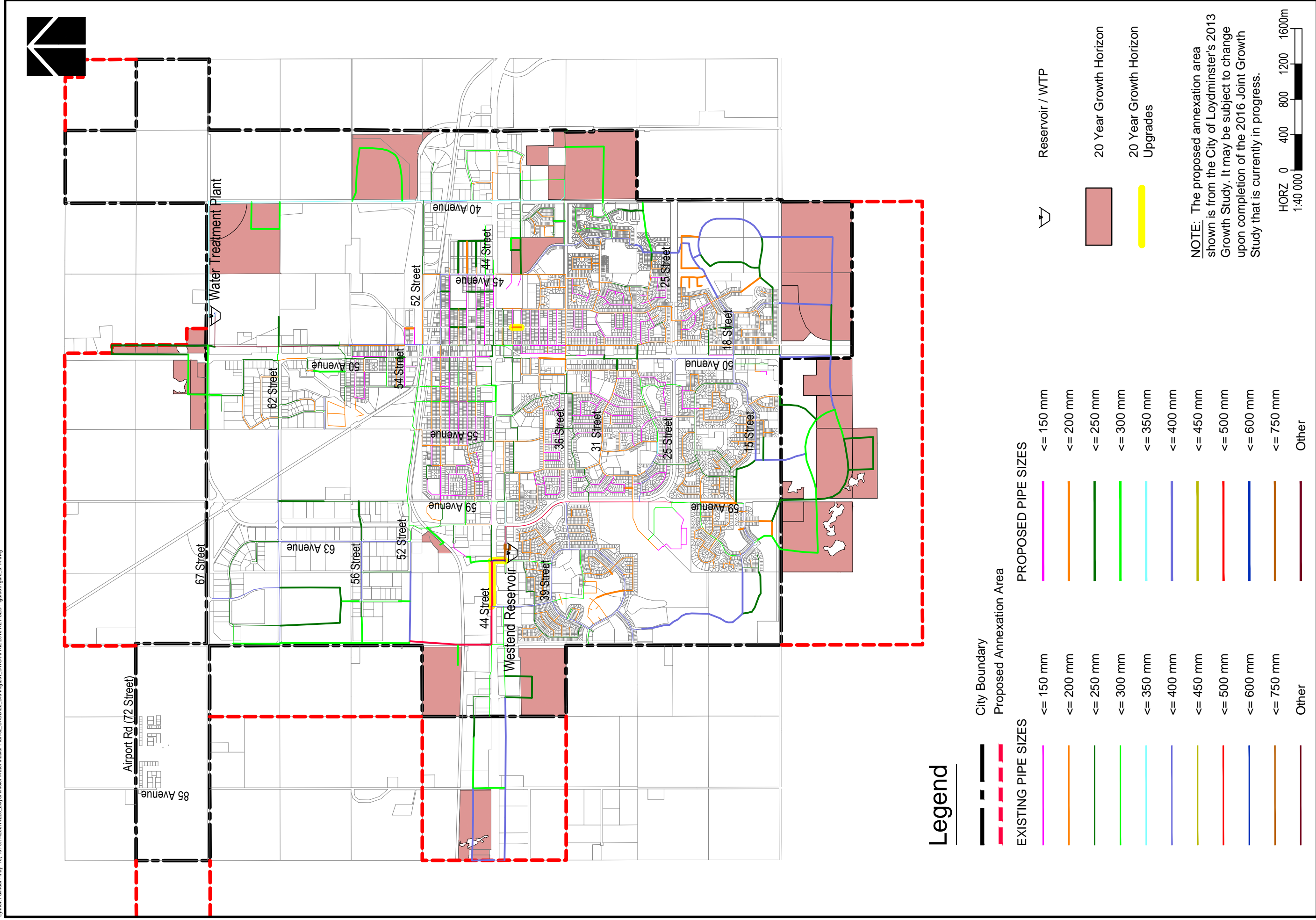


Legend

	City Boundary		Proposed Annexation Area		Reservoir / WTP
	<= 150 mm		<= 150 mm		Does Not Meet Fire Flow Requirements
	<= 200 mm		<= 200 mm		Meets Fire Flow Requirements
	<= 250 mm		<= 250 mm		10 Year Growth Horizon Upgrades
	<= 300 mm		<= 300 mm		
	<= 350 mm		<= 350 mm		
	<= 400 mm		<= 400 mm		
	<= 450 mm		<= 450 mm		
	<= 500 mm		<= 500 mm		
	<= 600 mm		<= 600 mm		
	<= 750 mm		<= 750 mm		
	Other		Other		

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.





Legend

- City Boundary
- Proposed Annexation Area

EXISTING PIPE SIZES

- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other

PROPOSED PIPE SIZES

- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other

- Reservoir / WTP



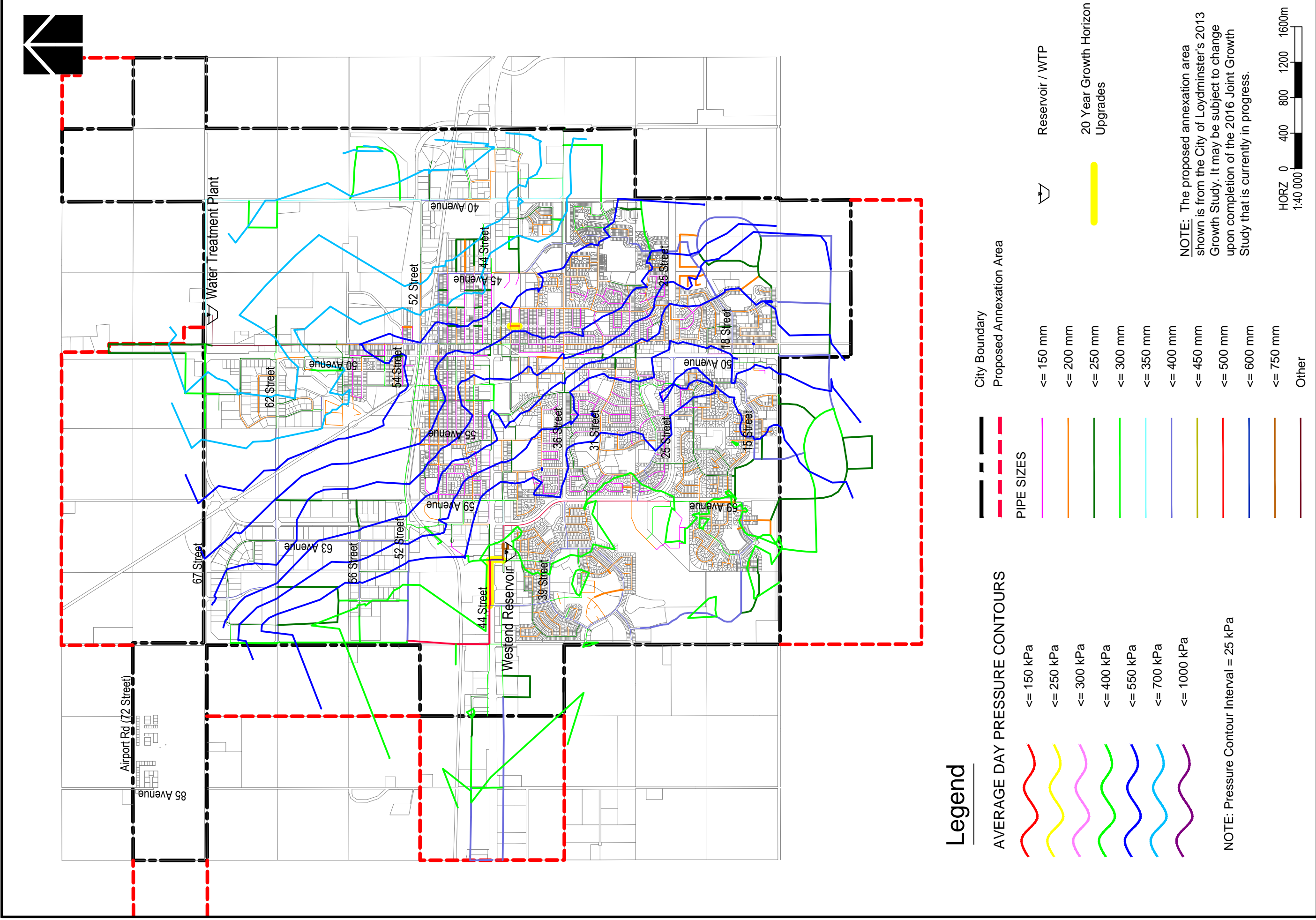
20 Year Growth Horizon



20 Year Growth Horizon Upgrades

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.





Legend

AVERAGE DAY PRESSURE CONTOURS

- ≤ 150 kPa
- ≤ 250 kPa
- ≤ 300 kPa
- ≤ 400 kPa
- ≤ 550 kPa
- ≤ 700 kPa
- ≤ 1000 kPa

NOTE: Pressure Contour Interval = 25 kPa

City Boundary

Proposed Annexation Area

PIPE SIZES

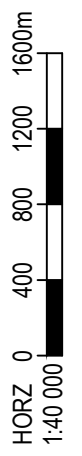
- ≤ 150 mm
- ≤ 200 mm
- ≤ 250 mm
- ≤ 300 mm
- ≤ 350 mm
- ≤ 400 mm
- ≤ 450 mm
- ≤ 500 mm
- ≤ 600 mm
- ≤ 750 mm
- Other



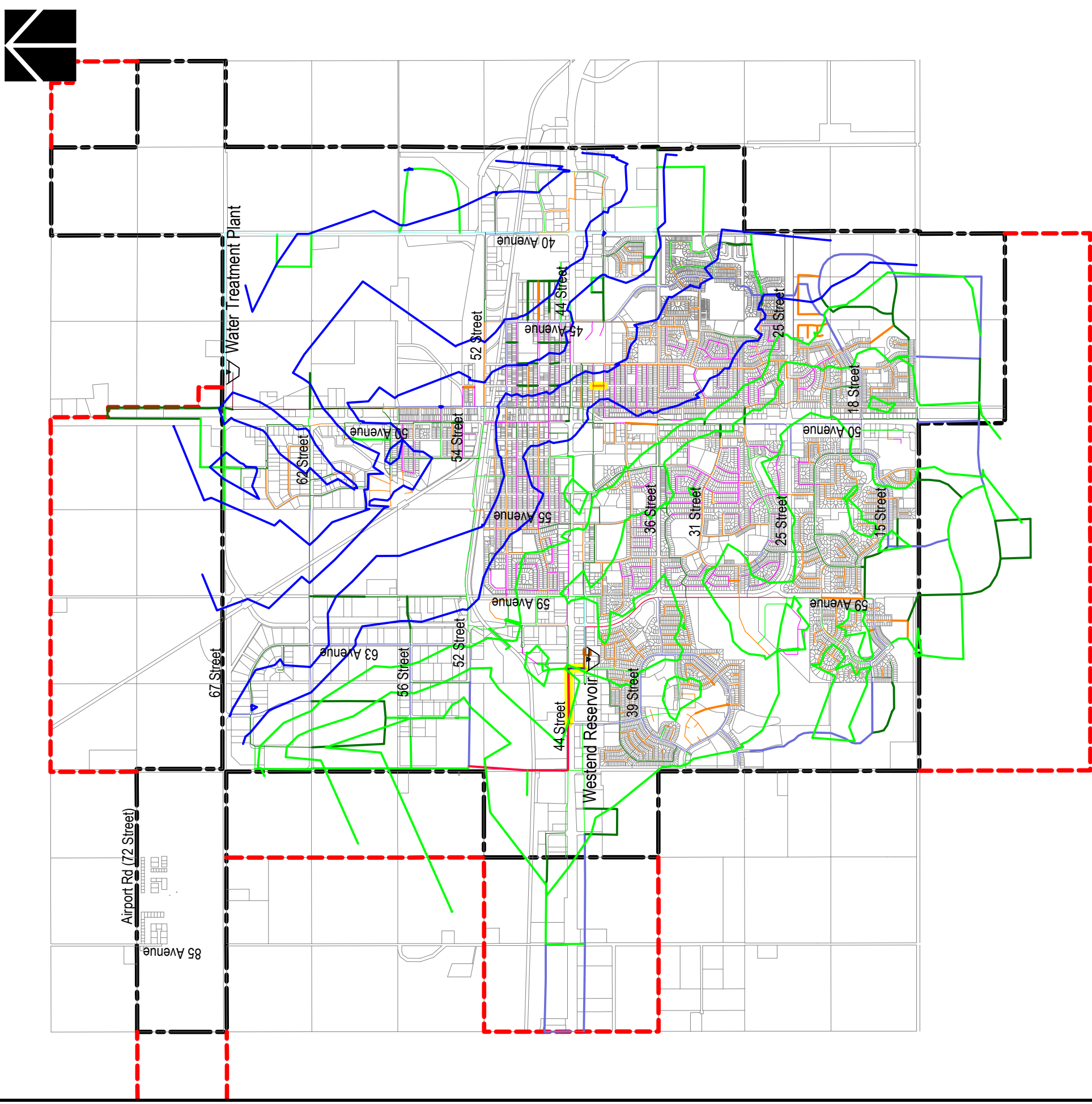
Reservoir / WTP



20 Year Growth Horizon Upgrades

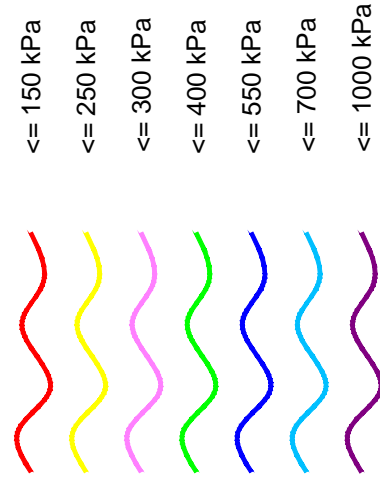


NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.



Legend

PEAK HOUR PRESSURE CONTOURS

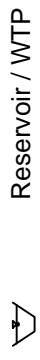
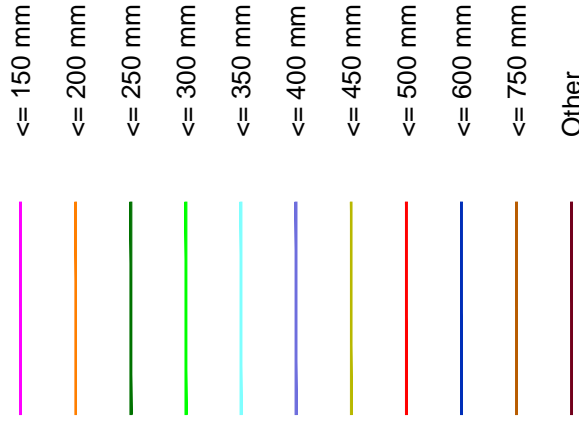


NOTE: Pressure Contour Interval = 25 kPa

City Boundary

Proposed Annexation Area

PIPE SIZES



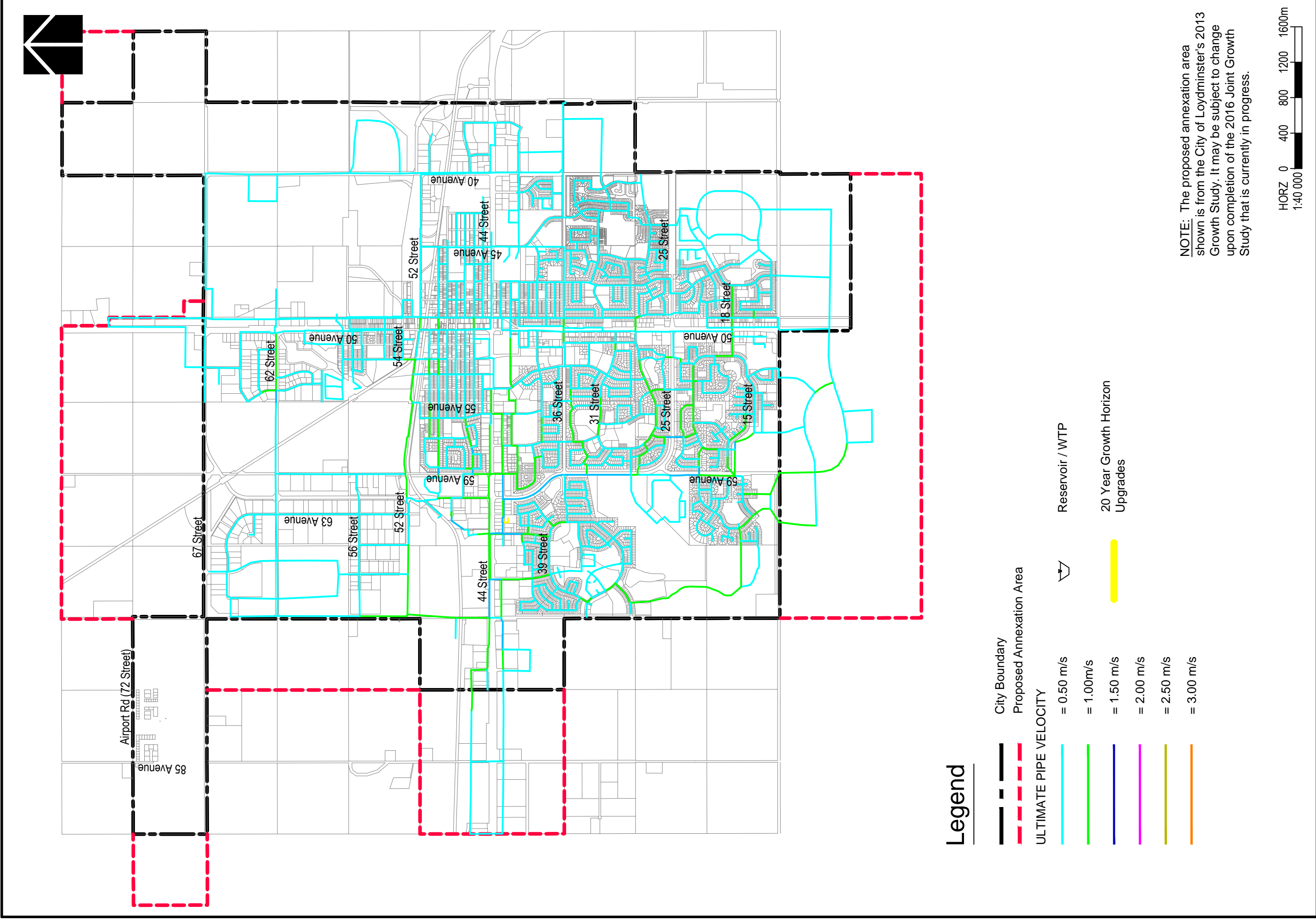
Reservoir / WTP



20 Year Growth Horizon Upgrades

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.



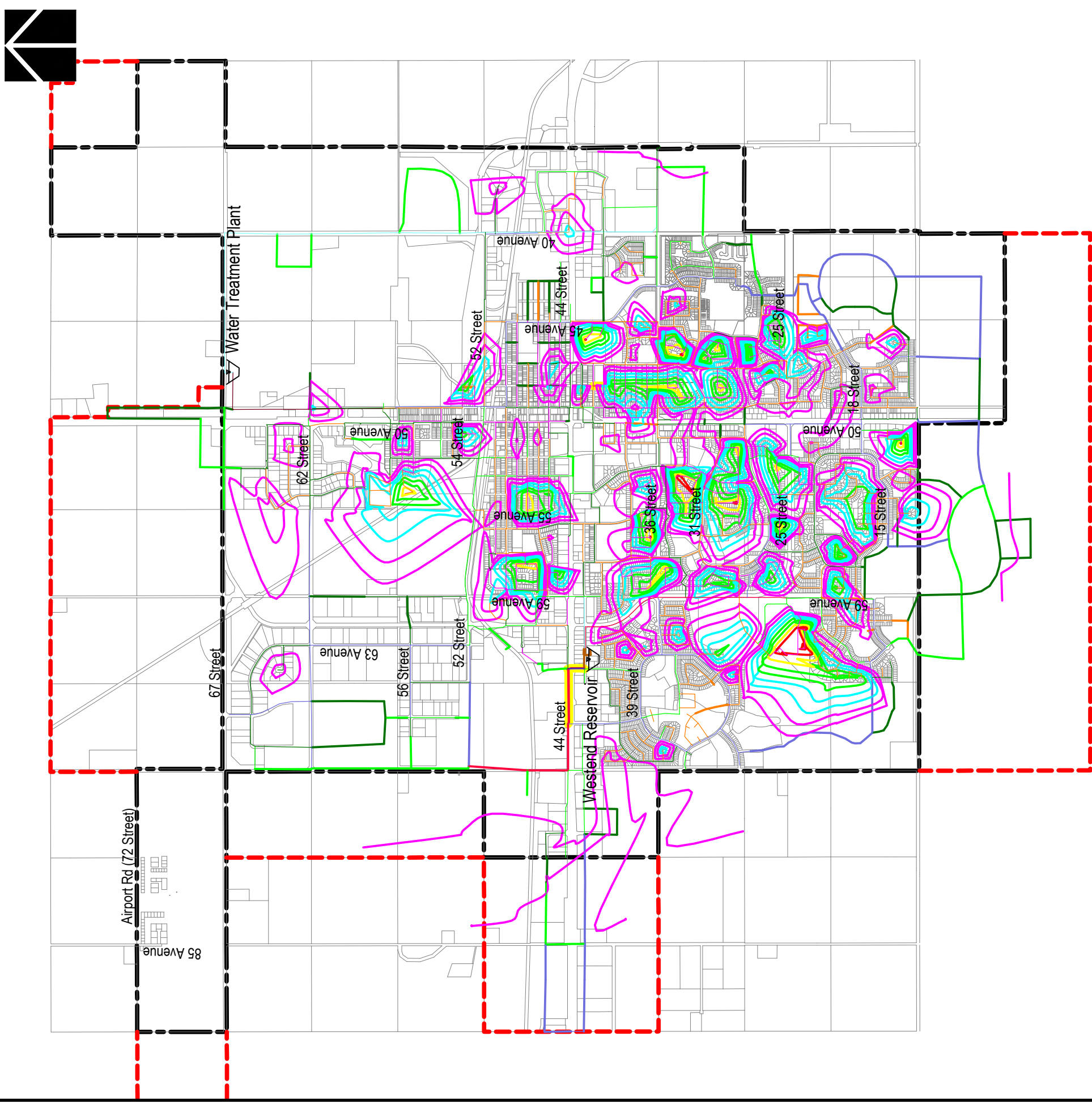


Legend

- City Boundary
- Proposed Annexation Area
- ULTIMATE PIPE VELOCITY**
- = 0.50 m/s
- = 1.00m/s
- = 1.50 m/s
- = 2.00 m/s
- = 2.50 m/s
- = 3.00 m/s
- Reservoir / WTP
- 20 Year Growth Horizon Upgrades

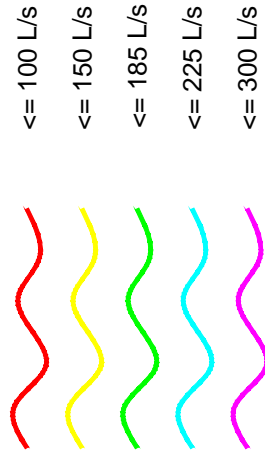
NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.

HORZ 0 400 800 1200 1600m
1:40 000

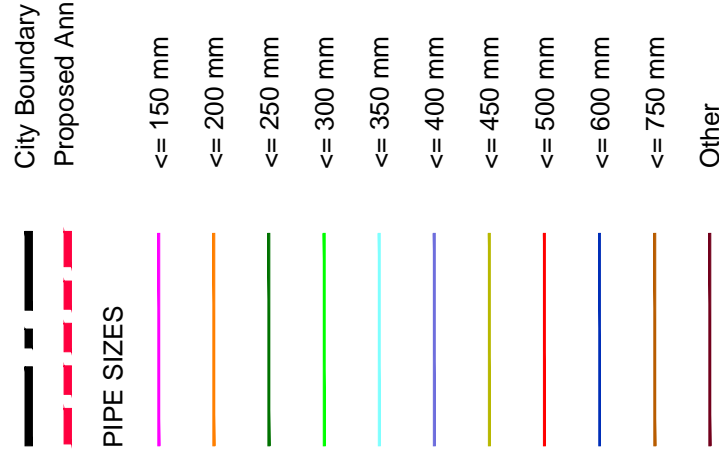


Legend

FIRE FLOW CONTOURS



NOTE: Fire Flow Interval = 25 L/s



City Boundary

Proposed Annexation Area



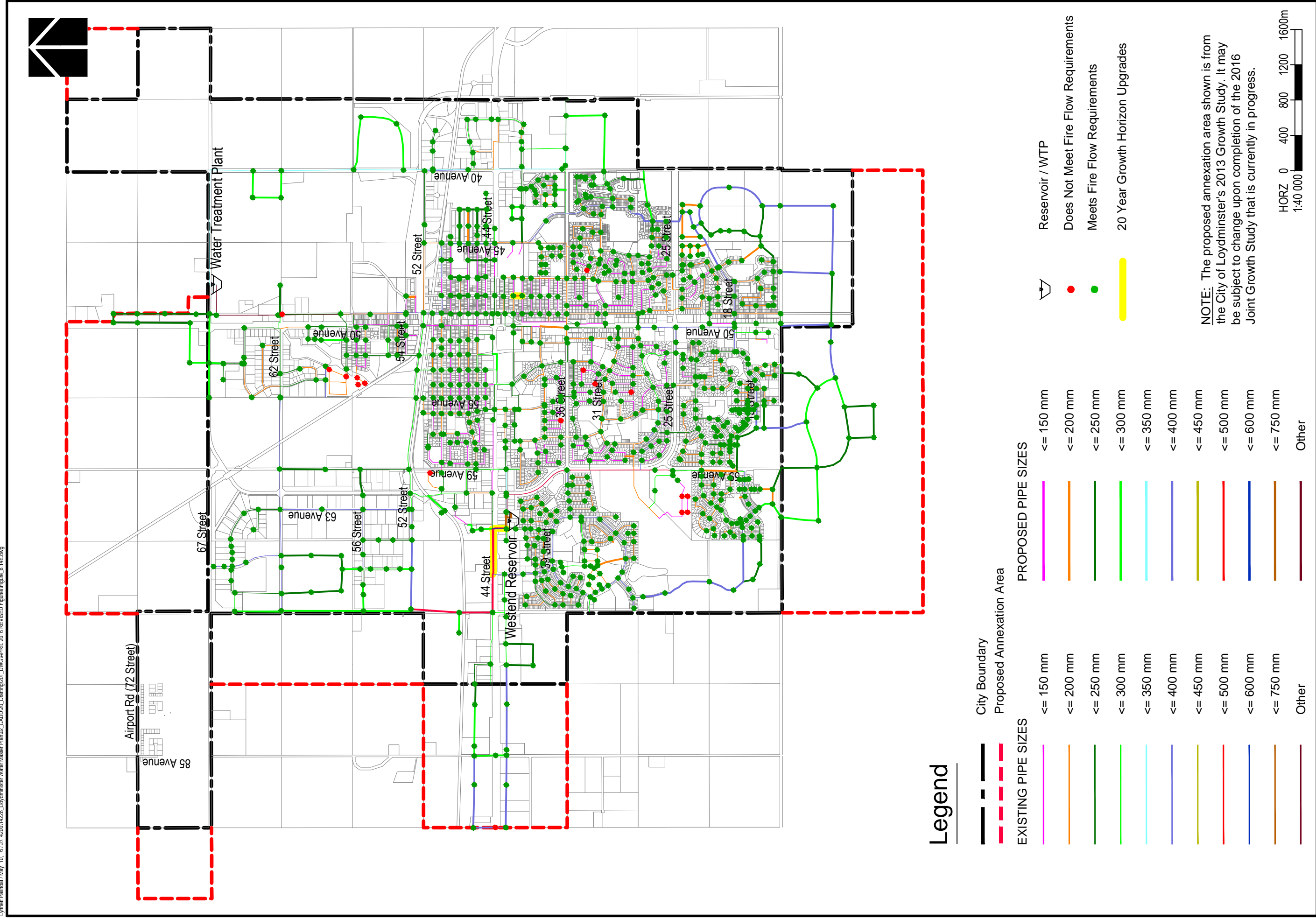
Reservoir / WTP



20 Year Growth Horizon Upgrades



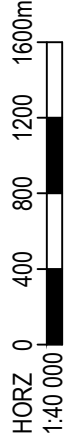
NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.



Legend

	City Boundary		Proposed Annexation Area		Reservoir / WTP
	<= 150 mm		<= 150 mm		Does Not Meet Fire Flow Requirements
	<= 200 mm		<= 200 mm		Meets Fire Flow Requirements
	<= 250 mm		<= 250 mm		20 Year Growth Horizon Upgrades
	<= 300 mm		<= 300 mm		
	<= 350 mm		<= 350 mm		
	<= 400 mm		<= 400 mm		
	<= 450 mm		<= 450 mm		
	<= 500 mm		<= 500 mm		
	<= 600 mm		<= 600 mm		
	<= 750 mm		<= 750 mm		
	Other		Other		

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.





7.0 Conclusions and Recommendations

7.1 Conclusions

The scope of this master plan study required that all system evaluation be performed on the basis of all water distribution occurring from the West End Reservoir, with the WTP distribution pumps being operated to supply the City directly only under emergency conditions. In addition, a dedicated fill line between the Water Treatment Plant and the West End Reservoir is planned to be constructed in the near term.

On this basis, evaluation of the existing water distribution system model results yielded the following conclusions:

- Existing system pressures are adequate provided that the West End Reservoir distribution pressure is raised to 375 kPa (703 m HGL) once all distribution switches to the West End Reservoir. A single pressure zone is adequate to service the existing development areas.
- Fire flow requirements are not met in several areas of the City, particularly where small diameter pipes service areas zoned for commercial or industrial development, which require higher fire flow requirements (up to 225 L/s). Operation of both the WTP and West End Reservoir pumps at the same time is required to provide maximum fire protection to the distribution system.
- A desktop distribution pipe condition assessment ranked the presumed condition of the pipes based on criteria such as age, material, and break history. The worst ranked pipes are generally located in the older downtown area where many breaks have occurred in the past. This condition assessment GIS data has been provided to the City so that they can maintain and update the database in the future.

The future system assessment yielded the following conclusions:

- The existing WTP pumps are capable of supplying the proposed dedicated fill line to the West End Reservoir up to about the 20 year growth horizon. Alternatively, new dedicated pumps could be installed at the WTP. An assessment was made to recommend the most cost effective combination of pumping scenarios and fill line sizing.
- Additional storage is required at the West End Reservoir within the next three years, based on Saskatchewan sizing guidelines. Additional storage upgrades are required in the 10 year and 20 year growth horizons.
- The distribution system should continue to operate in a single pressure zone for the foreseeable future (up to the 20 year growth horizon), however if excess pressures are experienced in low-lying areas system or building pressure reducing valves may be considered.
- Future system fire flows are expected to be within requirements in most locations of the City provided the recommended existing system and future system upgrades are implemented in a timely fashion, and looping in new development areas is adequate including a network backbone of 250 mm, 300 mm and 400 mm pipes.

7.2 Recommendations

7.2.1 Existing Water Distribution System

The following lists the required upgrades and operational recommendations for the existing water distribution system:

- Updates should be made to the City of Lloydminster development standards as discussed in Section 4.6, including changes to water demands and fire flow requirements.

- The City should continue to investigate the “blockages” and possible closed valves in the system as discussed in Section 5.3, and once they have been resolved, additional fire flow testing should be performed to confirm and update the model calibration.
- The fire flow improvement pipe upgrades listed in Table 5.9 and shown on Figure 5.10 (Section 5.6) should be implemented. These upgrades are listed in order of priority to help the City plan upgrading programs. These upgrades are based on operation of both the WTP and West End Reservoir pumps at the same time during fire flow conditions. Upgrading recommendations considered the condition assessment results presented in Section 3.

7.2.2 Future Water Distribution System

The following lists the required upgrades and operational recommendations for the future water distribution system:

Dedicated Fill Line and WTP Pumphouse

- It is recommended that the City construct the dedicated fill line for the West End Reservoir in the near term, to move towards the planned operational strategy of supplying the system primarily from the West End Reservoir.
- A 750 mm dedicated fill line supplied by the existing WTP distribution pumps is recommended in the near term. The existing pumps can be operated for approximately 20 years or more, depending on future system demands. Pump upgrades would be required under ultimate (40 year+) demand conditions to supply the design flow rate of 726 L/s.
- The cost difference between a 750 mm and 900 mm dedicated fill line should be reviewed at the time of detailed design. This is to confirm the conclusions of the master plan analysis, which is sensitive to these costs.
- If adequate funding is available, it is recommended that the dedicated fill line extend directly from the WTP to provide more operational flexibility, as discussed in Section 6.3. However, connecting at 62 Street / 50 Avenue is also feasible at a lower cost (depending on chlorine contact times, see the discussion in Section 6.3.2).
- Regardless of the tie-in location of the dedicated fill line (62 Street or WTP), the dedicated fill line system must be configured such that the WTP pumphouse can continue to supply fire flow to the distribution system, as discussed in Section 6.3. This would include actuated valves that can control the flow from the WTP to either the dedicated fill line or the distribution system (in case of emergency/fire).

West End Reservoir

- Construction of 9850 m³ of additional storage at the West End Reservoir is required within the next 3 years. In the 10 year growth horizon, demolish the existing above ground reservoir and construct a new 11,000 m³ reservoir in its place. In the 20 year horizon, at least 13,000 m³ of additional storage will be required, the location of which is to be determined. The future system analysis is based on the 20 year storage upgrade being located at or near the current West End Reservoir.
- Pumping upgrades will be required at the West End Reservoir in three to five years, depending on demand increases, as well as in the 10 and 20 year growth horizons, as discussed in Section 6.5.1. The projected required pumping capacity at the West End Reservoir in the 20 year growth horizon is 929 L/s, which is more than double the current rated capacity of 412 L/s.

Future Distribution System

- Existing system pipe upgrades to support future development are required, as listed in Table 6.17. These upgrades are in addition to those recommended to improve existing fire flows, and mostly consist of major pipe upgrades near the West End Reservoir to allow distribution of all future peak hour flows from that location. A few additional local fire flow pipe upgrades are also recommended.



- The City should ensure adequate looping and extension of major watermains occurs in new developments as recommended in future servicing Figures 6.10 to 6.13. Water modeling by developers at the time of development will be required to confirm adequate fire flows and pressures are met.



Appendix A
Water Demand Calculations



Table A1: Existing Water Model Demands

AREA_ID	TIMING	RESIDENTIAL			NON-RESIDENTIAL						PARKS & OPEN SPACE (ha)	TOTAL AREA (ha)	WATER CONSUMMING AREA (ha)	Model Node Input Location	ADD					MDD	PHD
		LOW DENSITY RES (ha)	MED DENSITY RES (ha)	POPULATION	COMMERCIAL (ha)	CBD COMMERCIAL (ha)	INDUSTRIAL (ha)	INSTITUTIONAL (ha)	OTHER AND DC (ha)	Residential Flow (L/s)					Commercial Flow (L/s)	CBD Commercial Flow (L/s)	Industrial Flow (L/s)	Institutional Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)
1	EXISTING	0.00	0.93	53	0.00	0.00	0.00	1.830	0.00	1.08	3.83	2.76	J-2105	0.11	0.00	0.00	0.00	0.10	0.21	0.42	0.63
2	EXISTING	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00	5.50	5.50	0.00	J-291	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	EXISTING	2.17	0.00	78	0.00	0.00	0.00	0.031	0.00	0.00	2.20	2.20	J-1372	0.16	0.00	0.00	0.00	0.00	0.16	0.32	0.48
4	EXISTING	4.18	0.00	149	0.00	0.00	0.00	0.000	0.00	0.00	4.18	4.18	J-1908	0.30	0.00	0.00	0.00	0.00	0.30	0.60	0.91
5	EXISTING	2.00	0.03	73	0.00	0.00	0.00	0.000	0.00	0.00	2.04	2.04	J-1912	0.15	0.00	0.00	0.00	0.00	0.15	0.30	0.45
6	EXISTING	2.73	1.05	157	0.00	0.00	0.00	0.000	0.00	0.00	3.78	3.78	J-149	0.32	0.00	0.00	0.00	0.00	0.32	0.64	0.96
7	EXISTING	4.87	0.00	174	0.00	0.00	0.00	0.000	0.00	0.63	5.50	4.87	J-1412	0.35	0.00	0.00	0.00	0.00	0.35	0.70	1.06
8	EXISTING	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00	7.11	7.11	0.00	J-3766	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	EXISTING	0.00	0.00	0	0.00	0.00	6.67	0.000	0.00	0.00	6.67	6.67	J-128	0.00	0.00	0.00	0.31	0.00	0.31	0.62	0.93
10	EXISTING	0.00	0.00	0	0.00	0.00	5.39	0.000	0.00	0.00	5.39	5.39	J-1628	0.00	0.00	0.00	0.25	0.00	0.25	0.50	0.75
11	EXISTING	0.00	0.00	0	0.00	0.00	7.58	0.000	0.00	0.00	7.58	7.58	J-2005	0.00	0.00	0.00	0.35	0.00	0.35	0.70	1.05
12	EXISTING	0.00	0.00	0	0.00	0.00	4.99	0.000	0.00	0.00	4.99	4.99	J-3656	0.00	0.00	0.00	0.23	0.00	0.23	0.46	0.69
13	EXISTING	0.00	0.00	0	0.00	0.00	10.49	0.000	0.00	0.00	10.49	10.49	J-3725	0.00	0.00	0.00	0.49	0.00	0.49	0.97	1.46
14	EXISTING	0.00	0.00	0	0.00	0.00	3.49	0.000	0.00	0.00	3.49	3.49	J-1108	0.00	0.00	0.00	0.16	0.00	0.16	0.32	0.48
15	EXISTING	0.00	0.00	0	0.00	0.00	80.13	0.000	0.00	0.00	80.13	80.13	J-61	0.00	0.00	0.00	3.71	0.00	3.71	7.42	11.13
16	EXISTING	0.00	0.00	0	0.00	0.00	3.69	0.000	0.00	0.00	3.69	3.69	3018	0.00	0.00	0.00	0.17	0.00	0.17	0.34	0.51
17	EXISTING	9.66	0.13	352	0.00	0.00	0.00	0.060	0.00	0.00	9.85	9.85	J-2397	0.71	0.00	0.00	0.00	0.00	0.72	1.43	2.15
18	EXISTING	2.35	0.00	84	0.00	0.00	0.00	0.000	0.00	0.00	2.35	2.35	J-1212	0.17	0.00	0.00	0.00	0.00	0.17	0.34	0.51
19	EXISTING	6.93	0.00	248	0.00	0.00	0.00	0.000	0.00	0.00	6.93	6.93	J-2122	0.50	0.00	0.00	0.00	0.00	0.50	1.00	1.50
20	EXISTING	2.62	0.10	99	0.00	0.00	0.00	0.000	0.00	0.00	2.71	2.71	J-1290	0.20	0.00	0.00	0.00	0.00	0.20	0.40	0.60
21	EXISTING	3.08	0.00	110	0.00	0.00	0.00	0.000	0.00	0.00	3.08	3.08	J-2048	0.22	0.00	0.00	0.00	0.00	0.22	0.45	0.67
22	EXISTING	4.73	0.00	169	0.00	0.00	0.00	0.000	0.00	0.00	4.73	4.73	J-2050	0.34	0.00	0.00	0.00	0.00	0.34	0.68	1.03
23	EXISTING	4.52	0.00	161	0.00	0.00	0.00	0.000	0.00	0.11	4.63	4.52	J-1174	0.33	0.00	0.00	0.00	0.00	0.33	0.65	0.98
24	EXISTING	3.61	0.00	129	0.00	0.00	0.00	0.000	0.00	0.00	3.61	3.61	J-1340	0.26	0.00	0.00	0.00	0.00	0.26	0.52	0.78
25	EXISTING	5.82	0.00	208	0.00	0.00	0.00	0.000	0.00	0.00	5.82	5.82	J-1168	0.42	0.00	0.00	0.00	0.00	0.42	0.84	1.26
26	EXISTING	0.02	0.00	1	0.00	0.00	0.00	6.120	0.00	0.00	6.14	6.14	J-3708	0.00	0.00	0.00	0.00	0.35	0.35	0.70	1.05
27	EXISTING	5.47	0.00	195	0.00	0.00	0.00	0.000	0.00	0.07	5.54	5.47	110827	0.40	0.00	0.00	0.00	0.00	0.40	0.79	1.19
28	EXISTING	0.00	0.00	0	0.00	0.00	4.04	0.000	0.00	0.00	4.04	4.04	J-47	0.00	0.00	0.00	0.19	0.00	0.19	0.37	0.56
29	EXISTING	0.00	0.00	0	0.00	0.00	4.08	0.000	0.00	0.00	4.08	4.08	J-45	0.00	0.00	0.00	0.19	0.00	0.19	0.38	0.57
30	EXISTING	0.00	0.00	0	0.00	0.00	7.75	0.000	0.00	0.00	7.75	7.75	J-10	0.00	0.00	0.00	0.36	0.00	0.36	0.72	1.08
31	EXISTING	0.00	0.00	0	0.00	0.00	6.38	0.000	0.00	0.00	6.38	6.38	J-2143	0.00	0.00	0.00	0.30	0.00	0.30	0.59	0.89
32	EXISTING	0.00	0.05	3	0.13	0.00	4.80	0.000	0.00	0.00	4.98	4.98	J-2142	0.01	0.02	0.00	0.22	0.00	0.25	0.49	0.74
33	EXISTING	0.11	0.00	4	3.05	0.00	0.00	0.000	0.00	0.00	3.16	3.16	J-1252	0.01	0.44	0.00	0.00	0.00	0.45	0.90	1.35
34	EXISTING	6.25	0.00	223	0.00	0.00	0.06	0.000	0.00	0.28	6.59	6.31	J-3808	0.45	0.00	0.00	0.00	0.00	0.46	0.91	1.37
35	EXISTING	4.66	0.00	167	0.00	0.00	0.00	0.000	0.00	0.00	4.66	4.66	J-50	0.34	0.00	0.00	0.00	0.00	0.34	0.68	1.01
36	EXISTING	0.00	0.00	0	0.00	0.00	5.75	0.000	0.00	0.00	5.75	5.75	J-3718	0.00	0.00	0.00	0.27	0.00	0.27	0.53	0.80
37	EXISTING	0.00	0.00	0	0.00	0.00	3.52	0.000	0.00	0.00	3.52	3.52	J-45	0.00	0.00	0.00	0.16	0.00	0.16	0.33	0.49
38	EXISTING	0.00	0.00	0	0.00	0.00	7.71	0.000	0.00	0.00	7.71	7.71	393471	0.00	0.00	0.00	0.36	0.00	0.36	0.71	1.07
39	EXISTING	0.00	0.00	0	0.00	0.00	2.56	0.000	0.00	0.00	2.56	2.56	J-42	0.00	0.00	0.00	0.12	0.00	0.12	0.24	0.36
40	EXISTING	0.00	0.00	0	0.00	0.00	3.20	0.000	0.00	0.00	3.20	3.20	J-2002	0.00	0.00	0.00	0.15	0.00	0.15	0.30	0.44
41	EXISTING	0.00	0.00	0	0.00	0.00	3.95	0.000	0.00	0.00	3.95	3.95	J-49	0.00	0.00	0.00	0.18	0.00	0.18	0.37	0.55
42	EXISTING	0.00	0.00	0	0.00	0.00	2.11	0.000	0.00	0.00	2.11	2.11	J-65	0.00	0.00	0.00	0.10	0.00	0.10	0.20	0.29
43	EXISTING	0.00	0.00	0	0.00	0.00	6.85	0.000	0.00	0.00	6.85	6.85	J-1108	0.00	0.00	0.00	0.32	0.00	0.32	0.63	0.95
44	EXISTING	0.00	0.00	0	0.00	0.00	4.51	0.000	0.00	0.00	4.51	4.51	J-1102	0.00	0.00	0.00	0.21	0.00	0.21	0.42	0.63
45	EXISTING	0.00	0.00	0	0.00	0.00	3.82	0.000	0.00	0.00	3.82	3.82	J-1104	0.00	0.00	0.00	0.18	0.00	0.18	0.35	0.53
46	EXISTING	0.00	0.00	0	0.00	0.00	4.47	0.000	0.00	0.00	4.47	4.47	167243	0.00	0.00	0.00	0.21	0.00	0.21	0.41	0.62
47	EXISTING	0.00	0.00	0	0.00	0.00	3.87	0.000	0.00	0.00	3.87	3.87	366848	0.00	0.00	0.00	0.18	0.00	0.18	0.36	0.54
48	EXISTING	0.00	0.00	0	0.00	0.00	3.47	0.000	0.00	0.00	3.47	3.47	J-3719	0.00	0.00	0.00	0.16	0.00	0.16	0.32	0.48
49	EXISTING	0.00	0.00	0	0.00	0.00	5.00	0.000	0.00	0.00	5.00	5.00	J-56	0.00	0.00	0.00	0.23	0.00	0.23	0.46	0.69
53	EXISTING	0.00	0.00	0	0.00	0.00	3.59	0.000	0.00	0.00	3.59	3.59	3018	0.00	0.00	0.00	0.17	0.00	0.17	0.33	0.50
54	EXISTING	5.18	0.00	185	0.00	0.00	0.00	0.173	0.00	0.00	5.35	5.35	J-1176	0.37	0.00	0.00	0.00	0.01	0.38	0.77	1.15
55	EXISTING	3.67	0.00	131	0.00	0.00	0.00	0.000	0.00	0.00	3.67	3.67	J-2051	0.27	0.00	0.00	0.00	0.00	0.27	0.53	0.80
56	EXISTING	0.00	3.44	197	0.37	0.00	0.00	0.000	0.00	0.00	3.81	3.81	J-2405	0.40	0.05	0.00	0.00	0.00	0.45	0.90	1.36
57	EXISTING	2.59	0.00	93	0.00	0.00	0.16	0.000	0.00	0.00	2.75	2.75	J-2406	0.19	0.00	0.00	0.01	0.00	0.20	0.39	0.59
58	EXISTING	3.10	0.00	111	0.00	0.00	0.00	0.110	0.00	0.00	3.21	3.21	J-95	0.22	0.00	0.00	0.00	0.01	0.23	0.46	0.69
59	EXISTING	0.47	0.00	17	0.00	0.00	0.00	0.000	0.00	0.00	0.47	0.47	J-3790	0.03	0.00	0.00	0.00	0.00	0.03	0.07	0.10

Table A1: Existing Water Model Demands

AREA_ID	TIMING	RESIDENTIAL			NON-RESIDENTIAL						PARKS & OPEN SPACE (ha)	TOTAL AREA (ha)	WATER CONSUMMING AREA (ha)	Model Node Input Location	ADD					Total Flow (L/s)	MDD Total Flow (L/s)	PHD Total Flow (L/s)
		LOW DENSITY RES (ha)	MED DENSITY RES (ha)	POPULATION	COMMERCIAL (ha)	CBD COMMERCIAL (ha)	INDUSTRIAL (ha)	INSTITUTIONAL (ha)	OTHER AND DC (ha)	Residential Flow (L/s)					Commercial Flow (L/s)	CBD Commercial Flow (L/s)	Industrial Flow (L/s)	Institutional Flow (L/s)				
60	EXISTING	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00	9.71	9.71	0.00	J-1172	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
61	EXISTING	3.05	0.00	109	0.00	0.00	0.00	0.000	0.00	0.21	3.26	3.05	166379	0.22	0.00	0.00	0.00	0.00	0.22	0.44	0.66	
62	EXISTING	7.01	0.00	251	0.00	0.00	0.00	0.000	0.00	0.00	7.01	7.01	J-2054	0.51	0.00	0.00	0.00	0.00	0.51	1.02	1.52	
63	EXISTING	0.00	0.00	0	0.00	0.00	0.00	5.189	0.00	0.00	5.19	5.19	J-96	0.00	0.00	0.00	0.00	0.29	0.29	0.59	0.88	
64	EXISTING	0.05	0.37	23	0.00	0.00	0.00	4.766	0.00	0.00	5.18	5.18	J-2404	0.05	0.00	0.00	0.00	0.27	0.32	0.63	0.95	
65	EXISTING	0.00	0.00	0	0.00	0.00	2.21	0.000	0.00	0.00	2.21	2.21	J-131	0.00	0.00	0.00	0.10	0.00	0.10	0.20	0.31	
66	EXISTING	0.00	0.00	0	0.00	0.00	3.01	0.000	0.00	0.00	3.01	3.01	J-132	0.00	0.00	0.00	0.14	0.00	0.14	0.28	0.42	
67	EXISTING	0.00	0.00	0	0.00	0.00	2.36	0.000	0.00	0.00	2.36	2.36	J-56	0.00	0.00	0.00	0.11	0.00	0.11	0.22	0.33	
68	EXISTING	0.00	0.00	0	0.00	0.00	7.27	0.000	0.00	0.00	7.27	7.27	J-64	0.00	0.00	0.00	0.34	0.00	0.34	0.67	1.01	
69	EXISTING	0.00	0.00	0	0.00	0.00	5.38	0.000	0.00	0.00	5.38	5.38	J-65	0.00	0.00	0.00	0.25	0.00	0.25	0.50	0.75	
70	EXISTING	0.00	0.00	0	0.00	0.00	6.25	0.000	0.00	0.00	6.25	6.25	J-1108	0.00	0.00	0.00	0.29	0.00	0.29	0.58	0.87	
71	EXISTING	0.00	0.00	0	0.00	0.00	8.69	0.000	0.00	0.00	8.69	8.69	J-170	0.00	0.00	0.00	0.40	0.00	0.40	0.80	1.21	
72	EXISTING	0.00	0.00	0	0.00	0.00	4.16	0.000	0.00	0.00	4.16	4.16	366501	0.00	0.00	0.00	0.19	0.00	0.19	0.39	0.58	
73	EXISTING	0.00	0.00	0	0.00	0.00	5.96	0.000	0.00	0.00	5.96	5.96	366751	0.00	0.00	0.00	0.28	0.00	0.28	0.55	0.83	
74	EXISTING	0.00	0.00	0	0.00	0.00	2.68	0.000	0.00	0.00	2.68	2.68	1833	0.00	0.00	0.00	0.12	0.00	0.12	0.25	0.37	
75	EXISTING	0.00	0.00	0	0.00	0.00	4.62	0.000	0.00	0.00	4.62	4.62	J-1528	0.00	0.00	0.00	0.21	0.00	0.21	0.43	0.64	
76	EXISTING	0.00	0.00	0	0.00	0.00	5.41	0.000	0.00	0.00	5.41	5.41	J-2004	0.00	0.00	0.00	0.25	0.00	0.25	0.50	0.75	
77	EXISTING	0.00	0.00	0	0.00	0.00	5.39	0.000	0.00	0.00	5.39	5.39	J-1628	0.00	0.00	0.00	0.25	0.00	0.25	0.50	0.75	
78	EXISTING	0.00	0.00	0	0.00	0.00	9.33	0.000	0.00	0.00	9.33	9.33	J-1628	0.00	0.00	0.00	0.43	0.00	0.43	0.86	1.30	
79	EXISTING	0.00	0.00	0	0.00	0.00	4.65	0.000	0.00	0.00	4.65	4.65	J-1628	0.00	0.00	0.00	0.22	0.00	0.22	0.43	0.65	
80	EXISTING	0.00	0.00	0	0.00	0.00	1.86	0.000	0.00	0.00	1.86	1.86	J-1104	0.00	0.00	0.00	0.09	0.00	0.09	0.17	0.26	
81	EXISTING	0.00	0.00	0	0.00	0.00	4.85	0.000	0.00	0.00	4.85	4.85	J-1584	0.00	0.00	0.00	0.22	0.00	0.22	0.45	0.67	
82	EXISTING	0.00	0.00	0	0.00	0.00	5.39	0.000	0.00	0.00	5.39	5.39	J-1584	0.00	0.00	0.00	0.25	0.00	0.25	0.50	0.75	
83	EXISTING	0.00	0.00	0	0.00	0.00	4.65	0.000	0.00	0.00	4.65	4.65	J-43	0.00	0.00	0.00	0.22	0.00	0.22	0.43	0.65	
84	EXISTING	0.00	0.00	0	0.00	0.00	7.59	0.000	0.00	0.00	7.59	7.59	393483	0.00	0.00	0.00	0.35	0.00	0.35	0.70	1.05	
85	EXISTING	2.28	2.02	197	0.05	0.00	0.36	0.367	0.00	0.00	5.08	5.08	J-2411	0.40	0.01	0.00	0.02	0.02	0.44	0.89	1.33	
86	EXISTING	3.08	0.32	128	0.00	0.00	0.00	0.000	0.00	0.43	3.82	3.39	J-3808	0.26	0.00	0.00	0.00	0.00	0.26	0.52	0.78	
87	EXISTING	2.42	0.00	86	0.07	0.00	0.00	3.146	0.00	0.00	5.64	5.64	J-2414	0.18	0.01	0.00	0.00	0.18	0.36	0.73	1.09	
88	EXISTING	0.23	0.00	8	0.00	0.00	4.18	0.120	0.00	0.00	4.53	4.53	J-283	0.02	0.00	0.00	0.19	0.01	0.22	0.43	0.65	
89	EXISTING	0.62	0.00	22	1.54	0.00	0.00	0.000	0.00	0.00	2.16	2.16	J-1256	0.04	0.22	0.00	0.00	0.00	0.27	0.53	0.80	
90	EXISTING	0.00	2.19	125	0.25	0.00	0.00	0.000	0.00	0.00	2.43	2.43	J-2137	0.25	0.04	0.00	0.00	0.00	0.29	0.58	0.87	
91	EXISTING	4.80	0.00	172	0.84	0.00	0.00	0.000	0.00	0.00	5.64	5.64	J-2415	0.35	0.12	0.00	0.00	0.00	0.47	0.94	1.41	
92	EXISTING	0.00	1.02	58	1.09	0.00	0.00	0.000	0.00	0.00	2.11	2.11	J-2139	0.12	0.16	0.00	0.00	0.00	0.28	0.55	0.83	
93	EXISTING	0.00	0.00	0	0.00	0.00	1.73	0.000	0.00	0.00	1.73	1.73	J-182	0.00	0.00	0.00	0.08	0.00	0.08	0.16	0.24	
94	EXISTING	0.00	0.00	0	0.00	0.00	4.85	0.000	0.00	0.00	4.85	4.85	J-182	0.00	0.00	0.00	0.22	0.00	0.22	0.45	0.67	
95	EXISTING	0.00	0.00	0	0.00	0.00	4.90	0.000	0.00	0.00	4.90	4.90	J-127	0.00	0.00	0.00	0.23	0.00	0.23	0.45	0.68	
96	EXISTING	0.00	0.00	0	0.00	0.42	2.65	0.000	0.00	0.00	3.07	3.07	J-14	0.00	0.00	0.06	0.12	0.00	0.18	0.37	0.55	
97	EXISTING	1.29	1.59	137	0.07	0.00	0.00	0.000	0.00	0.00	2.95	2.95	J-3811	0.28	0.01	0.00	0.00	0.00	0.29	0.58	0.86	
98	EXISTING	0.00	0.00	0	0.00	0.00	6.16	0.000	0.00	0.00	6.16	6.16	110603	0.00	0.00	0.00	0.29	0.00	0.29	0.57	0.86	
99	EXISTING	0.00	0.00	0	0.00	0.00	6.43	0.000	0.00	0.00	6.43	6.43	110585	0.00	0.00	0.00	0.30	0.00	0.30	0.59	0.89	
100	EXISTING	0.27	1.29	84	0.00	0.00	0.00	0.000	0.00	0.00	1.56	1.56	J-2381	0.17	0.00	0.00	0.00	0.00	0.17	0.34	0.51	
101	EXISTING	3.78	0.14	143	0.00	0.00	0.00	0.000	0.00	0.00	3.92	3.92	J-2381	0.29	0.00	0.00	0.00	0.00	0.29	0.58	0.87	
102	EXISTING	0.62	0.01	23	0.00	0.00	0.00	4.678	0.00	2.02	7.33	5.31	J-2378	0.05	0.00	0.00	0.00	0.27	0.31	0.62	0.94	
103	EXISTING	2.92	0.13	112	0.00	0.00	0.00	0.048	0.00	0.00	3.10	3.10	J-2379	0.23	0.00	0.00	0.00	0.00	0.23	0.46	0.69	
104	EXISTING	0.58	2.93	188	0.00	3.16	0.00	0.071	0.00	0.00	6.74	6.74	J-2383	0.38	0.00	0.46	0.00	0.00	0.84	1.69	2.53	
105	EXISTING	0.23	4.78	281	0.00	0.00	0.00	0.000	0.00	0.17	5.17	5.00	J-3809	0.57	0.00	0.00	0.00	0.00	0.57	1.14	1.71	
106	EXISTING	4.63	0.00	165	0.00	0.04	0.00	0.022	0.00	0.00	4.69	4.69	J-2321	0.34	0.00	0.01	0.00	0.00	0.34	0.68	1.03	
107	EXISTING	3.96	0.00	141	0.00	1.54	0.00	0.022	0.00	0.00	5.52	5.52	J-2374	0.29	0.00	0.22	0.00	0.00	0.51	1.02	1.53	
108	EXISTING	0.00	0.00	0	0.00	2.38	0.00	0.000	0.00	0.00	2.38	2.38	J-1246	0.00	0.00	0.34	0.00	0.00	0.34	0.69	1.03	
109	EXISTING	1.71	0.00	61	0.00	1.55	0.00	0.642	0.00	0.00	3.90	3.90	J-2375	0.12	0.00	0.22	0.00	0.04	0.38	0.77	1.15	
110	EXISTING	0.00	0.00	0	0.68	0.93	0.00	0.000	0.00	0.00	1.60	1.60	J-2384	0.00	0.10	0.13	0.00	0.00	0.23	0.46	0.70	
111	EXISTING	0.00	0.00	0	0.00	2.15	0.00	0.000	0.00	0.00	2.15	2.15	J-2114	0.00	0.00	0.31	0.00	0.00	0.31	0.62	0.93	
112	EXISTING	0.00	0.00	0	0.00	2.31	0.00	0.000	0.00	0.00	2.31	2.31	J-287	0.00	0.00	0.33	0.00	0.00	0.33	0.67	1.00	
113	EXISTING	0.00	0.00	0	0.00	2.01	0.00	0.000	0.00	0.00	2.01	2.01	J-20	0.00	0.00	0.29	0.00	0.00	0.29	0.58	0.87	
114	EXISTING	0.00	0.11	6	0.04	3.60	0.00	0.000	0.00	0.00	3.75	3.75	J-2367	0.01	0.01	0.52	0.00	0.00	0.54	1.08	1.62	
115	EXISTING	0.05	0.05	5	0.00	2.78	0.00	0.000	0.00	0.00	2.88	2.88	J-1244	0.01	0.00	0.40	0.00	0.00	0.41	0.82	1.23	

Table A1: Existing Water Model Demands

AREA_ID	TIMING	RESIDENTIAL			NON-RESIDENTIAL						PARKS & OPEN SPACE (ha)	TOTAL AREA (ha)	WATER CONSUMMING AREA (ha)	Model Node Input Location	ADD					MDD	PHD
		LOW DENSITY RES (ha)	MED DENSITY RES (ha)	POPULATION	COMMERCIAL (ha)	CBD COMMERCIAL (ha)	INDUSTRIAL (ha)	INSTITUTIONAL (ha)	OTHER AND DC (ha)	Residential Flow (L/s)					Commercial Flow (L/s)	CBD Commercial Flow (L/s)	Industrial Flow (L/s)	Institutional Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)
116	EXISTING	0.10	2.84	166	0.00	0.82	0.00	0.000	2.84	0.00	3.76	3.76	J-2368	0.34	0.00	0.12	0.00	0.00	0.45	0.91	1.36
117	EXISTING	0.16	1.76	106	0.83	0.00	0.17	0.000	0.00	0.00	2.92	2.92	J-57	0.22	0.12	0.00	0.01	0.00	0.34	0.69	1.03
118	EXISTING	0.96	0.76	77	0.00	0.00	0.00	0.000	0.00	0.00	1.71	1.71	J-273	0.16	0.00	0.00	0.00	0.00	0.16	0.31	0.47
119	EXISTING	0.05	0.00	2	0.00	3.26	0.00	0.000	0.88	0.00	3.31	3.31	J-1240	0.00	0.00	0.47	0.00	0.00	0.48	0.95	1.43
120	EXISTING	1.52	0.00	54	0.00	0.00	0.00	0.000	0.07	0.00	1.52	1.52	J-2371	0.11	0.00	0.00	0.00	0.00	0.11	0.22	0.33
121	EXISTING	1.53	0.00	55	0.00	0.00	0.00	0.000	0.00	0.00	1.53	1.53	J-2370	0.11	0.00	0.00	0.00	0.00	0.11	0.22	0.33
122	EXISTING	1.49	0.00	53	0.00	0.00	0.00	0.000	0.00	0.00	1.49	1.49	J-1524	0.11	0.00	0.00	0.00	0.00	0.11	0.22	0.32
123	EXISTING	0.00	0.00	0	4.88	0.00	0.00	0.000	4.88	0.00	4.88	4.88	J-3771	0.00	0.71	0.00	0.00	0.00	0.71	1.41	2.12
124	EXISTING	0.77	0.77	72	0.00	0.00	0.00	0.000	1.54	0.00	1.54	1.54	J-2369	0.15	0.00	0.00	0.00	0.00	0.15	0.29	0.44
125	EXISTING	2.68	0.18	106	0.04	0.00	0.28	0.000	0.00	0.00	3.19	3.19	J-2353	0.22	0.01	0.00	0.01	0.00	0.23	0.47	0.70
126	EXISTING	0.00	0.63	36	0.16	0.00	1.37	0.000	0.00	0.00	2.16	2.16	J-3816	0.07	0.02	0.00	0.06	0.00	0.16	0.32	0.48
127	EXISTING	0.00	0.00	0	0.00	0.00	2.62	0.000	0.00	0.00	2.62	2.62	J-1264	0.00	0.00	0.00	0.12	0.00	0.12	0.24	0.36
128	EXISTING	4.92	0.00	176	0.31	0.00	0.00	0.000	0.00	0.00	5.23	5.23	J-2355	0.36	0.04	0.00	0.00	0.00	0.40	0.80	1.20
129	EXISTING	4.89	0.00	175	0.00	0.00	0.00	0.000	0.00	0.00	4.89	4.89	J-2359	0.35	0.00	0.00	0.00	0.00	0.35	0.71	1.06
130	EXISTING	3.20	0.00	114	0.00	0.00	0.00	0.000	0.00	0.00	3.20	3.20	J-2358	0.23	0.00	0.00	0.00	0.00	0.23	0.46	0.69
131	EXISTING	3.22	0.00	115	0.00	0.00	0.00	0.000	0.00	0.00	3.22	3.22	J-2363	0.23	0.00	0.00	0.00	0.00	0.23	0.47	0.70
132	EXISTING	2.93	0.00	105	0.00	0.00	0.00	0.000	0.00	0.00	2.93	2.93	J-1272	0.21	0.00	0.00	0.00	0.00	0.21	0.42	0.64
133	EXISTING	2.11	0.08	80	0.00	0.00	0.00	0.000	0.00	0.00	2.20	2.20	J-1276	0.16	0.00	0.00	0.00	0.00	0.16	0.33	0.49
134	EXISTING	3.44	0.00	123	0.00	0.00	0.00	0.000	0.00	0.00	3.44	3.44	J-1234	0.25	0.00	0.00	0.00	0.00	0.25	0.50	0.75
135	EXISTING	2.76	0.53	129	0.00	0.00	0.00	0.000	0.00	0.00	3.29	3.29	J-1270	0.26	0.00	0.00	0.00	0.00	0.26	0.52	0.78
136	EXISTING	1.45	0.00	52	0.00	0.00	0.00	2.082	0.00	2.41	5.94	3.53	J-1228	0.10	0.00	0.00	0.00	0.12	0.22	0.45	0.67
137	EXISTING	2.62	0.00	94	0.00	0.00	0.00	2.766	0.00	0.00	5.39	5.39	J-3818	0.19	0.00	0.00	0.00	0.16	0.35	0.69	1.04
138	EXISTING	4.34	0.98	211	0.00	0.00	0.00	0.030	0.00	0.24	5.59	5.34	J-1268	0.43	0.00	0.00	0.00	0.00	0.43	0.86	1.29
139	EXISTING	9.80	0.00	350	0.00	0.00	0.00	0.000	0.00	0.00	9.80	9.80	J-1282	0.71	0.00	0.00	0.00	0.00	0.71	1.42	2.13
140	EXISTING	5.02	1.23	250	0.00	0.00	0.00	0.000	0.00	0.00	6.26	6.26	J-1230	0.51	0.00	0.00	0.00	0.00	0.51	1.01	1.52
141	EXISTING	2.12	0.00	76	0.00	0.00	0.06	0.000	0.00	0.00	2.18	2.18	J-72	0.15	0.00	0.00	0.00	0.00	0.16	0.31	0.47
142	EXISTING	0.00	0.00	0	3.23	0.00	0.40	0.000	0.00	0.00	3.64	3.64	J-325	0.00	0.47	0.00	0.02	0.00	0.49	0.97	1.46
143	EXISTING	0.00	0.00	0	0.50	0.00	1.12	0.000	0.00	0.00	1.62	1.62	J-2406	0.00	0.07	0.00	0.05	0.00	0.12	0.25	0.37
144	EXISTING	0.00	0.00	0	0.05	1.35	0.00	0.000	0.00	0.00	1.40	1.40	J-24	0.00	0.01	0.20	0.00	0.00	0.20	0.40	0.61
145	EXISTING	0.37	0.00	13	0.00	1.89	0.00	0.000	0.00	0.00	2.25	2.25	J-23	0.03	0.00	0.27	0.00	0.00	0.30	0.60	0.90
146	EXISTING	0.00	0.00	0	1.39	0.00	0.00	0.000	0.00	0.00	1.39	1.39	J-2385	0.00	0.20	0.00	0.00	0.00	0.20	0.40	0.60
147	EXISTING	0.00	0.00	0	3.92	0.00	0.00	0.000	0.00	0.00	3.92	3.92	J-138	0.00	0.57	0.00	0.00	0.00	0.57	1.13	1.70
148	EXISTING	0.00	0.00	0	4.10	0.00	0.00	0.000	0.00	0.00	4.10	4.10	J-3769	0.00	0.59	0.00	0.00	0.00	0.59	1.19	1.78
149	EXISTING	0.00	0.00	0	0.00	0.00	2.52	0.000	0.00	0.00	2.52	2.52	J-129	0.00	0.00	0.00	0.12	0.00	0.12	0.23	0.35
150	EXISTING	0.00	0.00	0	0.00	0.00	2.18	0.000	0.00	0.00	2.18	2.18	J-129	0.00	0.00	0.00	0.10	0.00	0.10	0.20	0.30
151	EXISTING	0.00	0.00	0	0.00	0.00	3.64	0.000	0.00	0.00	3.64	3.64	J-132	0.00	0.00	0.00	0.17	0.00	0.17	0.34	0.51
152	EXISTING	2.48	0.00	89	0.00	0.10	0.00	0.101	0.00	0.00	2.68	2.68	J-2108	0.18	0.00	0.01	0.00	0.01	0.20	0.40	0.60
153	EXISTING	2.86	0.00	102	0.11	0.00	0.00	0.182	0.00	0.00	3.15	3.15	J-290	0.21	0.02	0.00	0.00	0.01	0.23	0.47	0.70
154	EXISTING	0.00	0.00	0	0.00	0.00	11.17	0.000	0.00	0.00	11.17	11.17	J-70	0.00	0.00	0.00	0.52	0.00	0.52	1.03	1.55
155	EXISTING	0.00	0.00	0	0.00	0.00	1.49	0.000	0.00	0.00	1.49	1.49	J-66	0.00	0.00	0.00	0.07	0.00	0.07	0.14	0.21
156	EXISTING	0.00	0.00	0	0.56	0.00	3.21	0.000	0.00	0.00	3.78	3.78	J-73	0.00	0.08	0.00	0.15	0.00	0.23	0.46	0.69
157	EXISTING	0.00	0.00	0	1.42	0.00	1.34	0.000	0.00	0.00	2.76	2.76	J-76	0.00	0.21	0.00	0.06	0.00	0.27	0.53	0.80
158	EXISTING	0.07	0.00	3	0.00	7.25	0.00	0.365	0.00	0.00	7.69	7.69	J-82	0.01	0.00	1.05	0.00	0.02	1.07	2.15	3.22
159	EXISTING	5.60	0.00	200	0.00	0.00	0.00	0.085	0.00	0.00	5.68	5.68	J-90	0.41	0.00	0.00	0.00	0.00	0.41	0.82	1.23
160	EXISTING	0.30	0.12	17	0.28	0.28	2.02	3.436	0.00	0.00	6.43	6.43	J-91	0.04	0.04	0.04	0.09	0.19	0.40	0.81	1.21
161	EXISTING	0.00	0.00	0	0.55	6.06	0.00	0.000	0.00	0.00	6.61	6.61	J-79	0.00	0.08	0.88	0.00	0.00	0.96	1.91	2.87
162	EXISTING	2.51	0.00	90	0.00	0.00	0.00	0.000	0.00	0.00	2.51	2.51	J-292	0.18	0.00	0.00	0.00	0.00	0.18	0.36	0.54
163	EXISTING	1.49	0.00	53	0.00	0.00	0.00	0.000	0.00	0.00	1.49	1.49	J-290	0.11	0.00	0.00	0.00	0.00	0.11	0.22	0.32
164	EXISTING	0.00	0.02	1	0.05	2.63	0.01	0.000	0.00	0.00	2.71	2.71	J-27	0.00	0.01	0.38	0.00	0.00	0.39	0.78	1.17
165	EXISTING	0.00	0.00	0	3.14	0.75	0.00	0.000	0.00	0.00	3.89	3.89	J-2111	0.00	0.45	0.11	0.00	0.00	0.56	1.13	1.69
166	EXISTING	0.00	0.28	16	0.00	3.79	1.03	0.606	0.00	0.00	5.71	5.71	J-97	0.03	0.00	0.55	0.05	0.03	0.66	1.33	1.99
167	EXISTING	0.18	0.00	6	0.00	0.00	0.00	1.638	0.00	0.00	1.82	1.82	J-293	0.01	0.00	0.00	0.00	0.09	0.11	0.21	0.32
168	EXISTING	2.10	0.00	75	0.00	0.00	0.00	0.000	0.00	0.00	2.10	2.10	J-2322	0.15	0.00	0.00	0.00	0.00	0.15	0.30	0.46
169	EXISTING	2.50	0.00	89	0.00	0.00	0.00	0.000	0.00	1.03	3.53	2.50	J-2102	0.18	0.00	0.00	0.00	0.00	0.18	0.36	0.54
170	EXISTING	3.63	0.00	130	0.00	0.00	0.00	0.000	0.00	0.00	3.63	3.63	J-2106	0.26	0.00	0.00	0.00	0.00	0.26	0.53	0.79
171	EXISTING	4.66	0.00	167	0.00	0.00	0.00	0.000	0.00	0.00	4.66	4.66	J-2100	0.34	0.00	0.00	0.00	0.00	0.34	0.68	1.01

Table A1: Existing Water Model Demands

AREA_ID	TIMING	RESIDENTIAL			NON-RESIDENTIAL						PARKS & OPEN SPACE (ha)	TOTAL AREA (ha)	WATER CONSUMMING AREA (ha)	Model Node Input Location	ADD					MDD	PHD	
		LOW DENSITY RES (ha)	MED DENSITY RES (ha)	POPULATION	COMMERCIAL (ha)	CBD COMMERCIAL (ha)	INDUSTRIAL (ha)	INSTITUTIONAL (ha)	OTHER AND DC (ha)	Residential Flow (L/s)					Commercial Flow (L/s)	CBD Commercial Flow (L/s)	Industrial Flow (L/s)	Institutional Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	
172	EXISTING	3.55	0.00	127	0.00	0.00	0.00	0.332	0.00	0.00	0.00	3.88	3.88	J-2103	0.26	0.00	0.00	0.00	0.02	0.28	0.55	0.83
173	EXISTING	3.17	0.00	113	0.00	0.00	0.00	0.000	0.00	0.12	0.00	3.28	3.17	J-2410	0.23	0.00	0.00	0.00	0.00	0.23	0.46	0.69
174	EXISTING	3.82	0.00	136	0.00	0.00	0.00	0.000	0.00	0.00	0.00	3.82	3.82	J-3745	0.28	0.00	0.00	0.00	0.00	0.28	0.55	0.83
175	EXISTING	0.00	0.00	0	0.00	0.00	0.00	2.951	0.00	0.00	0.00	2.95	2.95	J-2099	0.00	0.00	0.00	0.00	0.17	0.17	0.33	0.50
176	EXISTING	0.85	0.05	33	0.03	0.00	0.00	1.749	0.00	0.00	0.00	2.67	2.67	J-3758	0.07	0.00	0.00	0.00	0.10	0.17	0.34	0.51
177	EXISTING	2.42	0.00	87	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.42	2.42	J-144	0.18	0.00	0.00	0.00	0.00	0.18	0.35	0.53
178	EXISTING	5.87	0.00	210	0.09	0.00	0.00	0.000	0.00	0.00	0.00	5.96	5.96	J-2095	0.42	0.01	0.00	0.00	0.00	0.44	0.88	1.31
179	EXISTING	0.00	0.00	0	0.64	0.00	0.00	0.000	0.00	0.00	0.00	0.64	0.64	J-2097	0.00	0.09	0.00	0.00	0.00	0.09	0.18	0.28
180	EXISTING	4.14	0.00	148	0.00	0.00	0.00	0.000	0.00	0.00	0.00	4.14	4.14	J-2094	0.30	0.00	0.00	0.00	0.00	0.30	0.60	0.90
181	EXISTING	0.00	3.21	183	0.00	0.00	0.00	0.000	0.00	0.00	0.00	3.21	3.21	J-97	0.37	0.00	0.00	0.00	0.00	0.37	0.74	1.11
182	EXISTING	1.05	3.56	241	0.30	0.00	0.00	0.000	0.00	0.00	0.00	4.91	4.91	J-1520	0.49	0.04	0.00	0.00	0.00	0.53	1.06	1.60
183	EXISTING	8.20	0.17	303	0.00	0.00	0.00	0.122	0.00	0.11	0.00	8.60	8.49	J-2118	0.61	0.00	0.00	0.00	0.01	0.62	1.24	1.86
184	EXISTING	0.00	0.66	38	1.78	0.00	0.00	0.000	0.00	0.00	0.00	2.44	2.44	J-27	0.08	0.26	0.00	0.00	0.00	0.33	0.67	1.00
185	EXISTING	0.00	0.03	2	0.00	0.00	0.00	1.400	0.00	1.95	0.00	3.39	1.43	J-1220	0.00	0.00	0.00	0.00	0.08	0.08	0.17	0.25
186	EXISTING	0.68	0.00	24	0.00	0.00	0.00	2.866	0.00	0.05	0.00	3.60	3.55	J-1296	0.05	0.00	0.00	0.00	0.16	0.21	0.42	0.64
187	EXISTING	1.29	1.28	119	0.13	0.00	0.00	0.027	0.00	0.00	0.00	2.72	2.72	J-2403	0.24	0.02	0.00	0.00	0.00	0.26	0.52	0.79
188	EXISTING	0.00	0.00	0	2.24	0.00	0.00	0.000	0.00	0.00	0.00	2.24	2.24	J-2320	0.00	0.32	0.00	0.00	0.00	0.32	0.65	0.97
189	EXISTING	2.24	0.01	81	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.25	2.25	J-2391	0.16	0.00	0.00	0.00	0.00	0.16	0.33	0.49
190	EXISTING	3.85	0.00	137	0.00	0.00	0.00	0.000	0.00	0.02	0.00	3.87	3.85	J-112	0.28	0.00	0.00	0.00	0.00	0.28	0.56	0.84
191	EXISTING	0.17	0.00	6	0.00	0.00	0.00	1.526	0.00	0.00	0.00	1.70	1.70	J-116	0.01	0.00	0.00	0.00	0.09	0.10	0.20	0.30
192	EXISTING	5.52	0.00	197	0.00	0.00	0.00	0.209	0.00	0.00	0.00	5.73	5.73	J-2387	0.40	0.00	0.00	0.00	0.01	0.41	0.82	1.23
193	EXISTING	0.18	0.41	30	0.16	0.00	0.00	8.132	0.00	7.22	0.00	16.10	8.88	J-106	0.06	0.02	0.00	0.00	0.46	0.54	1.09	1.63
194	EXISTING	0.00	0.02	1	0.00	0.00	0.00	1.241	0.00	0.00	0.00	1.26	1.26	J-114	0.00	0.00	0.00	0.00	0.07	0.07	0.15	0.22
195	EXISTING	2.13	0.00	76	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.13	2.13	J-1292	0.15	0.00	0.00	0.00	0.00	0.15	0.31	0.46
196	EXISTING	3.72	0.00	133	0.00	0.00	0.00	0.000	0.00	0.00	0.00	3.72	3.72	J-1210	0.27	0.00	0.00	0.00	0.00	0.27	0.54	0.81
197	EXISTING	2.78	0.00	99	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.78	2.78	J-1432	0.20	0.00	0.00	0.00	0.00	0.20	0.40	0.60
198	EXISTING	2.60	0.00	93	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.60	2.60	J-118	0.19	0.00	0.00	0.00	0.00	0.19	0.38	0.57
199	EXISTING	2.17	0.00	78	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.17	2.17	J-121	0.16	0.00	0.00	0.00	0.00	0.16	0.31	0.47
200	EXISTING	0.90	1.92	142	0.05	0.00	0.00	0.000	0.00	0.05	0.00	2.91	2.86	J-1300	0.29	0.01	0.00	0.00	0.00	0.29	0.59	0.88
201	EXISTING	4.54	0.00	162	0.00	0.00	0.00	0.000	0.00	0.00	0.00	4.54	4.54	J-2392	0.33	0.00	0.00	0.00	0.00	0.33	0.66	0.99
202	EXISTING	0.00	1.45	83	0.00	0.00	0.00	0.000	0.00	0.00	0.00	1.45	1.45	J-1300	0.17	0.00	0.00	0.00	0.00	0.17	0.34	0.50
203	EXISTING	1.82	0.13	72	0.00	0.00	0.00	0.000	0.00	0.00	0.00	1.95	1.95	J-320	0.15	0.00	0.00	0.00	0.00	0.15	0.29	0.44
204	EXISTING	0.17	0.00	6	0.00	0.00	0.00	1.487	0.00	0.00	0.00	1.65	1.65	J-106	0.01	0.00	0.00	0.00	0.08	0.10	0.19	0.29
205	EXISTING	5.02	0.00	179	0.00	0.00	0.00	0.000	0.00	0.00	0.00	5.02	5.02	J-317	0.36	0.00	0.00	0.00	0.00	0.36	0.73	1.09
206	EXISTING	6.00	0.00	214	0.00	0.00	0.00	0.000	0.00	0.00	0.00	6.00	6.00	J-1434	0.43	0.00	0.00	0.00	0.00	0.43	0.87	1.30
207	EXISTING	2.54	0.00	91	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.54	2.54	J-102	0.18	0.00	0.00	0.00	0.00	0.18	0.37	0.55
208	EXISTING	3.36	0.00	120	0.00	0.00	0.00	0.070	0.00	0.00	0.00	3.43	3.43	J-100	0.24	0.00	0.00	0.00	0.00	0.25	0.49	0.74
209	EXISTING	2.12	0.00	76	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.12	2.12	J-1286	0.15	0.00	0.00	0.00	0.00	0.15	0.31	0.46
210	EXISTING	5.48	0.00	196	0.00	0.00	0.00	0.000	0.00	0.70	0.00	6.18	5.48	J-2393	0.40	0.00	0.00	0.00	0.00	0.40	0.79	1.19
211	EXISTING	1.38	0.10	55	0.00	0.00	0.00	0.069	0.00	0.12	0.00	1.67	1.55	J-275	0.11	0.00	0.00	0.00	0.00	0.12	0.23	0.35
212	EXISTING	4.87	0.00	174	0.00	0.00	0.00	0.000	0.00	0.00	0.00	4.87	4.87	J-2398	0.35	0.00	0.00	0.00	0.00	0.35	0.70	1.06
213	EXISTING	1.77	0.10	69	0.02	0.00	0.00	0.000	0.00	0.00	0.00	1.88	1.88	J-1506	0.14	0.00	0.00	0.00	0.00	0.14	0.28	0.43
214	EXISTING	0.01	0.00	0	0.00	0.91	0.00	3.591	0.00	0.00	0.00	4.51	4.51	J-82	0.00	0.00	0.13	0.00	0.20	0.34	0.67	1.01
215	EXISTING	0.00	0.00	0	0.00	0.00	0.00	4.073	0.00	0.00	0.00	4.07	4.07	J-83	0.00	0.00	0.00	0.00	0.23	0.23	0.46	0.69
216	EXISTING	0.00	0.00	0	1.59	2.29	0.00	0.000	0.00	0.00	0.00	3.88	3.88	J-1506	0.00	0.23	0.33	0.00	0.00	0.56	1.12	1.69
217	EXISTING	0.00	2.80	160	0.00	0.00	0.18	0.000	0.00	0.00	0.00	2.97	2.97	J-310	0.32	0.00	0.00	0.01	0.00	0.33	0.66	1.00
218	EXISTING	0.00	0.00	0	2.79	0.00	0.08	0.000	0.00	0.00	0.00	2.88	2.88	J-86	0.00	0.40	0.00	0.00	0.00	0.41	0.82	1.22
219	EXISTING	0.00	0.00	0	3.25	0.00	0.00	0.000	0.00	0.00	0.00	3.25	3.25	J-2405	0.00	0.47	0.00	0.00	0.00	0.47	0.94	1.41
220	EXISTING	0.00	0.00	0	0.00	0.00	0.72	0.000	0.00	0.00	0.00	0.72	0.72	J-303	0.00	0.00	0.00	0.03	0.00	0.03	0.07	0.10
221	EXISTING	0.00	0.00	0	0.00	0.00	1.32	0.000	0.00	0.00	0.00	1.32	1.32	J-87	0.00	0.00	0.00	0.06	0.00	0.06	0.12	0.18
222	EXISTING	0.31	0.00	11	0.00	0.00	1.07	0.000	0.00	0.00	0.00	1.38	1.38	J-78	0.02	0.00	0.00	0.05	0.00	0.07	0.14	0.22
223	EXISTING	0.00	0.00	0	0.00	0.00	3.82	0.000	0.00	0.00	0.00	3.82	3.82	J-168	0.00	0.00	0.00	0.18	0.00	0.18	0.35	0.53
224	EXISTING	0.09	0.95	58	0.00	0.00	0.00	0.000	0.00	0.00	0.00	1.04	1.04	J-2027	0.12	0.00	0.00	0.00	0.00	0.12	0.23	0.35
225	EXISTING	0.54	0.00	19	0.00	0.00	0.00	0.000	0.00	0.00	0.00	0.54	0.54	J-2027	0.04	0.00	0.00	0.00	0.00	0.04	0.08	0.12
226	EXISTING	1.67	0.00	60	0.00	0.00	0.00	0.000	0.00	0.00	0.00	1.67	1.67	J-1118	0.12	0.00	0.00	0.00	0.00	0.12	0.24	0.36
227	EXISTING	2.43	0.00	87	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.43	2.43	J-1114	0.18	0.00	0.00	0.00	0.00	0.18	0.35	0.53

Table A1: Existing Water Model Demands

AREA_ID	TIMING	RESIDENTIAL			NON-RESIDENTIAL						PARKS & OPEN SPACE (ha)	TOTAL AREA (ha)	WATER CONSUMMING AREA (ha)	Model Node Input Location	ADD					MDD	PHD	
		LOW DENSITY RES (ha)	MED DENSITY RES (ha)	POPULATION	COMMERCIAL (ha)	CBD COMMERCIAL (ha)	INDUSTRIAL (ha)	INSTITUTIONAL (ha)	OTHER AND DC (ha)	Residential Flow (L/s)					Commercial Flow (L/s)	CBD Commercial Flow (L/s)	Industrial Flow (L/s)	Institutional Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	
228	EXISTING	0.11	1.20	73	0.00	0.00	0.00	0.000	0.00	0.00	0.00	1.31	1.31	J-1384	0.15	0.00	0.00	0.00	0.00	0.15	0.29	0.44
229	EXISTING	1.24	0.00	44	0.00	0.00	0.00	0.000	0.00	0.00	0.00	1.24	1.24	J-1136	0.09	0.00	0.00	0.00	0.00	0.09	0.18	0.27
230	EXISTING	2.10	0.00	75	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.10	2.10	J-1126	0.15	0.00	0.00	0.00	0.00	0.15	0.30	0.46
231	EXISTING	2.16	0.00	77	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.16	2.16	J-1132	0.16	0.00	0.00	0.00	0.00	0.16	0.31	0.47
232	EXISTING	5.08	0.00	181	0.00	0.00	0.00	0.000	0.00	0.00	0.00	5.08	5.08	J-1162	0.37	0.00	0.00	0.00	0.00	0.37	0.73	1.10
233	EXISTING	3.63	0.00	130	0.00	0.00	0.00	0.111	0.00	0.00	0.00	3.74	3.74	J-1146	0.26	0.00	0.00	0.00	0.01	0.27	0.54	0.81
234	EXISTING	5.06	0.00	181	0.00	0.00	0.00	0.000	0.00	0.00	0.00	5.06	5.06	J-2029	0.37	0.00	0.00	0.00	0.00	0.37	0.73	1.10
235	EXISTING	2.44	0.00	87	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.44	2.44	J-2026	0.18	0.00	0.00	0.00	0.00	0.18	0.35	0.53
236	EXISTING	0.05	1.12	66	0.00	0.00	0.00	0.000	0.00	0.00	0.00	1.17	1.17	J-1390	0.13	0.00	0.00	0.00	0.00	0.13	0.27	0.40
237	EXISTING	0.00	0.00	0	1.18	0.00	0.00	0.000	0.00	0.00	0.00	1.18	1.18	J-2009	0.00	0.17	0.00	0.00	0.00	0.17	0.34	0.51
238	EXISTING	0.00	0.00	0	1.18	0.00	0.00	0.000	0.00	0.00	0.00	1.18	1.18	J-1192	0.00	0.17	0.00	0.00	0.00	0.17	0.34	0.51
239	EXISTING	0.00	0.00	0	2.69	0.00	0.00	0.000	0.00	0.00	0.00	2.69	2.69	J-1190	0.00	0.39	0.00	0.00	0.00	0.39	0.78	1.17
240	EXISTING	0.00	1.89	108	0.99	0.00	0.00	0.000	0.00	0.00	0.00	2.89	2.89	J-2018	0.22	0.14	0.00	0.00	0.00	0.36	0.73	1.09
241	EXISTING	0.00	0.00	0	1.15	0.00	0.00	0.000	0.00	0.00	0.00	1.15	1.15	J-1190	0.00	0.17	0.00	0.00	0.00	0.17	0.33	0.50
242	EXISTING	0.00	0.00	0	4.74	0.00	0.00	0.000	0.00	0.00	0.00	4.74	4.74	J-1190	0.00	0.69	0.00	0.00	0.00	0.69	1.37	2.06
243	EXISTING	0.20	0.00	7	4.43	0.00	0.00	0.000	0.00	0.00	0.00	4.62	4.62	J-1194	0.01	0.64	0.00	0.00	0.00	0.65	1.31	1.96
244	EXISTING	0.00	0.00	0	0.00	0.00	0.00	19.184	0.00	0.00	0.00	19.18	19.18	J-1534	0.00	0.00	0.00	0.00	1.09	1.09	2.18	3.26
245	EXISTING	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00	3.40	0.00	3.40	0.00	J-2039	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
246	EXISTING	4.79	0.00	171	0.03	0.00	0.00	0.000	0.00	0.00	0.00	4.83	4.83	J-2016	0.35	0.00	0.00	0.00	0.00	0.35	0.70	1.06
247	EXISTING	4.64	0.02	167	0.00	0.00	0.00	0.000	0.00	0.00	0.00	4.66	4.66	J-2011	0.34	0.00	0.00	0.00	0.00	0.34	0.68	1.01
248	EXISTING	4.10	0.00	147	0.00	0.00	0.00	0.000	0.00	0.00	0.00	4.10	4.10	J-1426	0.30	0.00	0.00	0.00	0.00	0.30	0.59	0.89
249	EXISTING	6.44	0.00	230	0.00	0.00	0.00	0.000	0.00	0.00	0.00	6.44	6.44	J-1378	0.47	0.00	0.00	0.00	0.00	0.47	0.93	1.40
250	EXISTING	3.27	0.00	117	0.00	0.00	0.00	0.000	0.00	0.00	0.00	3.27	3.27	J-1366	0.24	0.00	0.00	0.00	0.00	0.24	0.47	0.71
251	EXISTING	4.12	0.00	147	0.00	0.00	0.00	0.000	0.00	0.00	0.00	4.12	4.12	127105	0.30	0.00	0.00	0.00	0.00	0.30	0.60	0.89
252	EXISTING	0.86	3.05	205	0.00	0.00	0.00	0.000	0.00	0.00	0.00	3.91	3.91	J-298	0.42	0.00	0.00	0.00	0.00	0.42	0.83	1.25
253	EXISTING	6.38	0.09	233	0.00	0.00	0.00	0.000	0.00	0.00	0.00	6.47	6.47	J-2092	0.47	0.00	0.00	0.00	0.00	0.47	0.94	1.42
254	EXISTING	4.73	0.00	169	0.00	0.00	0.00	0.000	0.00	0.06	0.00	4.79	4.73	J-3747	0.34	0.00	0.00	0.00	0.00	0.34	0.68	1.03
255	EXISTING	0.00	0.00	0	6.10	0.00	0.00	0.000	0.00	0.00	0.00	6.10	6.10	J-2402	0.00	0.88	0.00	0.00	0.00	0.88	1.76	2.65
256	EXISTING	3.65	0.00	130	0.00	0.00	0.00	0.097	0.00	0.44	0.00	4.19	3.75	107051	0.26	0.00	0.00	0.00	0.01	0.27	0.54	0.81
257	EXISTING	3.80	0.00	136	0.00	0.00	0.00	0.000	0.00	0.00	0.00	3.80	3.80	110726	0.28	0.00	0.00	0.00	0.00	0.28	0.55	0.83
258	EXISTING	0.00	0.00	0	6.87	0.00	0.00	0.000	0.00	0.00	0.00	6.87	6.87	J-3216	0.00	0.99	0.00	0.00	0.00	0.99	1.99	2.98
259	EXISTING	0.00	4.20	240	0.00	0.00	0.00	0.000	0.00	0.00	0.00	4.20	4.20	398225	0.49	0.00	0.00	0.00	0.00	0.49	0.97	1.46
260	EXISTING	7.14	0.00	255	0.00	0.00	0.00	0.000	0.00	0.00	0.00	7.14	7.14	J-1354	0.52	0.00	0.00	0.00	0.00	0.52	1.03	1.55
261	EXISTING	8.73	0.00	312	0.00	0.00	0.00	0.000	0.00	1.00	0.00	9.73	8.73	J-2035	0.63	0.00	0.00	0.00	0.00	0.63	1.26	1.90
262	EXISTING	7.65	0.00	273	0.00	0.00	0.00	0.000	0.00	0.00	0.00	7.65	7.65	J-3798	0.55	0.00	0.00	0.00	0.00	0.55	1.11	1.66
263	EXISTING	5.58	0.00	199	0.00	0.00	0.00	0.000	0.00	0.00	0.00	5.58	5.58	J-2031	0.40	0.00	0.00	0.00	0.00	0.40	0.81	1.21
264	EXISTING	4.19	0.00	150	0.00	0.00	0.00	0.000	0.00	0.00	0.00	4.19	4.19	J-1356	0.30	0.00	0.00	0.00	0.00	0.30	0.61	0.91
265	EXISTING	4.43	0.00	158	0.00	0.00	0.00	0.000	0.00	0.00	0.00	4.43	4.43	J-3788	0.32	0.00	0.00	0.00	0.00	0.32	0.64	0.96
266	EXISTING	3.61	0.00	129	0.00	0.00	0.00	0.000	0.00	0.25	0.00	3.86	3.61	J-3791	0.26	0.00	0.00	0.00	0.00	0.26	0.52	0.78
267	EXISTING	0.00	0.00	0	0.00	0.00	0.00	3.608	0.00	0.00	0.00	3.61	3.61	J-1180	0.00	0.00	0.00	0.00	0.20	0.20	0.41	0.61
268	EXISTING	3.89	0.00	139	0.00	0.00	0.00	0.000	0.00	0.00	0.00	3.89	3.89	J-217	0.28	0.00	0.00	0.00	0.00	0.28	0.56	0.84
269	EXISTING	5.87	0.00	210	0.00	0.00	0.00	0.000	0.00	0.00	0.00	5.87	5.87	J-1500	0.43	0.00	0.00	0.00	0.00	0.43	0.85	1.28
270	EXISTING	0.00	0.00	0	3.60	0.00	0.00	0.000	0.00	0.00	0.00	3.60	3.60	J-1206	0.00	0.52	0.00	0.00	0.00	0.52	1.04	1.56
271	EXISTING	2.60	2.07	211	0.00	0.00	0.00	0.000	0.00	0.00	0.00	4.68	4.68	J-1422	0.43	0.00	0.00	0.00	0.00	0.43	0.86	1.29
272	EXISTING	2.37	0.00	85	0.00	0.00	0.00	0.000	0.00	0.91	0.00	3.28	2.37	157379	0.17	0.00	0.00	0.00	0.00	0.17	0.34	0.51
273	EXISTING	5.05	0.00	180	0.00	0.00	0.00	0.000	0.00	0.12	0.00	5.17	5.05	J-2062	0.37	0.00	0.00	0.00	0.00	0.37	0.73	1.10
274	EXISTING	4.77	0.00	170	0.00	0.00	0.00	0.000	0.00	0.00	0.00	4.77	4.77	J-3755	0.34	0.00	0.00	0.00	0.00	0.34	0.69	1.03
275	EXISTING	7.15	0.00	255	0.00	0.00	0.00	0.000	0.00	0.00	0.00	7.15	7.15	J-3749	0.52	0.00	0.00	0.00	0.00	0.52	1.03	1.55
276	EXISTING	2.63	0.00	94	0.00	0.00	0.00	0.000	0.00	0.42	0.00	3.05	2.63	J-2063	0.19	0.00	0.00	0.00	0.00	0.19	0.38	0.57
277	EXISTING	0.02	1.45	83	0.00	0.00	0.00	0.000	0.00	0.21	0.00	1.67	1.46	J-2058	0.17	0.00	0.00	0.00	0.00	0.17	0.34	0.51
278	EXISTING	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00	8.94	0.00	8.94	0.00	J-2076	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
279	EXISTING	2.54	0.39	113	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.93	2.93	J-1410	0.23	0.00	0.00	0.00	0.00	0.23	0.46	0.69
280	EXISTING	2.49	0.00	89	0.00	0.00	0.00	0.000	0.00	0.00	0.00	2.49	2.49	J-151	0.18	0.00	0.00	0.00	0.00	0.18	0.36	0.54
281	EXISTING	2.10	0.00	75	0.00	0.00	0.00	0.153	0.00	0.00	0.00	2.25	2.25	J-2089	0.15	0.00	0.00	0.00	0.01	0.16	0.32	0.48
282	EXISTING	4.05	0.00	145	0.00	0.00	0.00	0.000	0.00	0.00	0.00	4.05	4.05	J-2089	0.29	0.00	0.00	0.00	0.00	0.29	0.59	0.88
283	EXISTING	0.03	0.02	2	0.00	0.00	0.00	1.730	0.00	1.80	0.00	3.58	1.78	J-148	0.00	0.00	0.00	0.00	0.10	0.10	0.21	0.31

Table A1: Existing Water Model Demands

AREA_ID	TIMING	RESIDENTIAL			NON-RESIDENTIAL					PARKS & OPEN SPACE (ha)	TOTAL AREA (ha)	WATER CONSUMMING AREA (ha)	Model Node Input Location	ADD					MDD	PHD		
		LOW DENSITY RES (ha)	MED DENSITY RES (ha)	POPULATION	COMMERCIAL (ha)	CBD COMMERCIAL (ha)	INDUSTRIAL (ha)	INSTITUTIONAL (ha)	OTHER AND DC (ha)					Residential Flow (L/s)	Commercial Flow (L/s)	CBD Commercial Flow (L/s)	Industrial Flow (L/s)	Institutional Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	
284	EXISTING	2.48	0.00	89	0.00	0.00	0.00	0.000	0.00	0.07	2.55	2.48	J-298	0.18	0.00	0.00	0.00	0.00	0.18	0.36	0.54	
285	EXISTING	2.80	0.00	100	0.07	0.00	0.00	0.000	0.00	0.00	2.87	2.87	J-29	0.20	0.01	0.00	0.00	0.00	0.21	0.43	0.64	
286	EXISTING	2.84	0.00	102	0.00	0.00	0.00	0.000	0.00	0.00	2.84	2.84	J-153	0.21	0.00	0.00	0.00	0.00	0.21	0.41	0.62	
287	EXISTING	3.30	0.00	118	0.00	0.00	0.00	0.285	0.00	0.00	3.58	3.58	J-276	0.24	0.00	0.00	0.00	0.02	0.25	0.51	0.76	
288	EXISTING	1.77	0.00	63	0.00	0.00	0.00	0.000	0.00	0.00	1.77	1.77	J-301	0.13	0.00	0.00	0.00	0.00	0.13	0.26	0.38	
289	EXISTING	0.80	0.00	29	0.00	0.00	0.00	0.000	0.00	0.00	0.80	0.80	J-157	0.06	0.00	0.00	0.00	0.00	0.06	0.12	0.17	
290	EXISTING	2.47	0.00	88	0.00	0.00	0.00	0.000	0.00	0.00	2.47	2.47	J-3734	0.18	0.00	0.00	0.00	0.00	0.18	0.36	0.54	
291	EXISTING	2.04	0.00	73	0.00	0.00	0.00	0.000	0.00	0.00	2.04	2.04	J-1408	0.15	0.00	0.00	0.00	0.00	0.15	0.29	0.44	
292	EXISTING	2.99	0.00	107	0.00	0.00	0.00	0.000	0.00	0.00	2.99	2.99	J-3730	0.22	0.00	0.00	0.00	0.00	0.22	0.43	0.65	
293	EXISTING	1.52	0.00	54	0.00	0.00	0.00	0.000	0.00	0.00	1.52	1.52	J-1466	0.11	0.00	0.00	0.00	0.00	0.11	0.22	0.33	
294	EXISTING	2.19	0.00	78	0.00	0.00	0.00	0.000	0.00	0.00	2.19	2.19	J-1468	0.16	0.00	0.00	0.00	0.00	0.16	0.32	0.48	
295	EXISTING	2.85	0.00	102	0.00	0.00	0.00	0.000	0.00	0.00	2.85	2.85	J-1222	0.21	0.00	0.00	0.00	0.00	0.21	0.41	0.62	
296	EXISTING	0.28	0.83	58	0.00	0.00	0.00	0.000	0.00	0.50	1.61	1.11	J-300	0.12	0.00	0.00	0.00	0.00	0.12	0.23	0.35	
297	EXISTING	1.65	0.00	59	0.00	0.00	0.00	0.000	0.00	0.00	1.65	1.65	J-299	0.12	0.00	0.00	0.00	0.00	0.12	0.24	0.36	
298	EXISTING	0.00	0.00	0	3.44	0.00	0.00	0.000	0.00	0.00	3.44	3.44	J-1222	0.00	0.50	0.00	0.00	0.00	0.50	1.00	1.49	
299	EXISTING	2.49	0.00	89	0.00	0.00	0.00	0.000	0.00	0.06	2.55	2.49	J-302	0.18	0.00	0.00	0.00	0.00	0.18	0.36	0.54	
300	EXISTING	0.00	0.00	0	3.66	0.00	0.00	0.000	0.00	0.25	3.91	3.66	J-2072	0.00	0.53	0.00	0.00	0.00	0.53	1.06	1.59	
301	EXISTING	0.49	0.00	18	6.02	0.00	0.63	0.000	0.00	0.00	7.14	7.14	J-1400	0.04	0.87	0.00	0.03	0.00	0.94	1.87	2.81	
302	EXISTING	0.00	0.00	0	3.81	0.00	0.00	0.000	0.00	0.03	3.83	3.81	J-2073	0.00	0.55	0.00	0.00	0.00	0.55	1.10	1.65	
303	EXISTING	6.56	0.39	256	0.00	0.00	0.00	0.000	0.00	0.00	6.95	6.95	J-2084	0.52	0.00	0.00	0.00	0.00	0.52	1.04	1.56	
304	EXISTING	2.15	0.00	77	0.00	0.00	0.00	0.000	0.00	0.22	2.37	2.15	J-1916	0.16	0.00	0.00	0.00	0.00	0.16	0.31	0.47	
305	EXISTING	2.82	3.32	290	0.00	0.00	0.00	0.000	0.00	0.55	6.68	6.14	J-1914	0.59	0.00	0.00	0.00	0.00	0.59	1.18	1.77	
306	EXISTING	1.91	2.89	234	0.00	0.00	0.00	0.000	0.00	0.02	4.83	4.81	J-1920	0.47	0.00	0.00	0.00	0.00	0.47	0.95	1.42	
307	EXISTING	1.14	1.24	112	0.00	0.00	0.00	0.000	0.00	0.00	2.38	2.38	J-37	0.23	0.00	0.00	0.00	0.00	0.23	0.45	0.68	
308	EXISTING	2.04	0.09	78	0.03	0.00	0.00	0.000	0.00	0.00	2.15	2.15	J-34	0.16	0.00	0.00	0.00	0.00	0.16	0.32	0.49	
309	EXISTING	1.84	1.83	170	0.00	0.00	0.00	0.000	0.00	0.00	3.67	3.67	J-1906	0.35	0.00	0.00	0.00	0.00	0.35	0.69	1.04	
310	EXISTING	3.23	2.15	238	0.00	0.00	0.00	0.000	0.00	0.00	5.38	5.38	J-1904	0.48	0.00	0.00	0.00	0.00	0.48	0.96	1.45	
311	EXISTING	2.80	0.00	100	0.00	0.00	0.00	0.000	0.00	0.00	2.80	2.80	J-3738	0.20	0.00	0.00	0.00	0.00	0.20	0.41	0.61	
312	EXISTING	0.59	0.00	21	0.40	0.00	4.06	0.000	0.00	0.00	5.05	5.05	J-1998	0.04	0.06	0.00	0.19	0.00	0.29	0.58	0.86	
313	EXISTING	5.13	0.00	183	0.05	0.00	0.00	0.000	0.00	0.34	5.52	5.18	J-200	0.37	0.01	0.00	0.00	0.00	0.38	0.76	1.14	
314	EXISTING	6.13	0.00	219	0.00	0.00	0.00	0.000	0.00	0.16	6.28	6.13	J-1420	0.44	0.00	0.00	0.00	0.00	0.44	0.89	1.33	
315	EXISTING	0.12	0.00	4	3.76	0.00	0.00	0.000	0.00	0.00	3.88	3.88	J-35	0.01	0.54	0.00	0.00	0.00	0.55	1.10	1.66	
316	EXISTING	4.98	0.93	231	0.00	0.00	0.00	0.000	0.00	0.00	5.91	5.91	J-2082	0.47	0.00	0.00	0.00	0.00	0.47	0.94	1.40	
317	EXISTING	4.58	0.98	220	0.00	0.00	0.00	0.000	0.00	0.00	5.56	5.56	J-1932	0.44	0.00	0.00	0.00	0.00	0.44	0.89	1.33	
318	EXISTING	0.00	0.00	0	0.00	0.00	4.01	0.000	0.00	0.00	4.01	4.01	J-45	0.00	0.00	0.00	0.19	0.00	0.19	0.37	0.56	
319	EXISTING	0.00	0.00	0	0.00	0.00	3.15	0.000	0.00	0.00	3.15	3.15	J-42	0.00	0.00	0.00	0.15	0.00	0.15	0.29	0.44	
320	EXISTING	0.00	0.00	0	0.00	0.00	2.38	0.000	0.00	0.00	2.38	2.38	3144	0.00	0.00	0.00	0.11	0.00	0.11	0.22	0.33	
321	EXISTING	0.00	0.00	0	3.39	0.00	0.00	0.000	0.00	0.00	3.39	3.39	J-2401	0.00	0.49	0.00	0.00	0.00	0.49	0.98	1.47	
322	EXISTING	4.60	0.00	164	0.00	0.00	0.00	0.000	0.00	0.00	4.60	4.60	J-2043	0.33	0.00	0.00	0.00	0.00	0.33	0.67	1.00	
323	EXISTING	0.00	0.00	0	0.92	0.00	0.00	0.000	0.00	0.00	0.92	0.92	J-168	0.00	0.13	0.00	0.00	0.00	0.13	0.27	0.40	
324	EXISTING	0.00	0.00	0	0.42	0.00	0.65	0.000	0.00	0.00	1.07	1.07	J-168	0.00	0.06	0.00	0.03	0.00	0.09	0.18	0.27	
325	EXISTING	0.11	0.07	8	0.00	0.00	0.00	1.389	0.00	0.00	1.57	1.57	J-101	0.02	0.00	0.00	0.00	0.08	0.10	0.19	0.29	
326	EXISTING	0.00	1.88	107	0.00	0.00	0.00	0.000	0.00	0.00	1.88	1.88	J-107	0.22	0.00	0.00	0.00	0.00	0.22	0.43	0.65	
327	EXISTING	2.51	0.00	90	0.00	0.00	0.00	0.080	0.00	0.00	2.59	2.59	J-113	0.18	0.00	0.00	0.00	0.00	0.19	0.37	0.56	
328	EXISTING	3.95	0.00	141	0.01	0.00	0.00	0.000	0.00	0.06	4.03	3.96	J-2390	0.29	0.00	0.00	0.00	0.00	0.29	0.58	0.86	
329	EXISTING	0.00	0.00	0	0.00	0.79	0.00	1.184	0.00	0.00	1.97	1.97	J-1278	0.00	0.00	0.11	0.00	0.07	0.18	0.36	0.54	
330	EXISTING	0.65	0.00	23	0.00	0.00	0.00	0.000	0.00	0.00	0.65	0.65	J-1396	0.05	0.00	0.00	0.00	0.00	0.05	0.09	0.14	
331	EXISTING	6.45	0.01	231	0.00	0.00	0.00	0.000	0.00	0.00	6.46	6.46	J-1522	0.47	0.00	0.00	0.00	0.00	0.47	0.94	1.40	
332	EXISTING	2.57	0.00	92	0.00	0.00	0.00	0.012	0.00	0.00	2.59	2.59	186795	0.19	0.00	0.00	0.00	0.00	0.19	0.37	0.56	
333	EXISTING	0.00	0.00	0	0.00	0.00	3.34	0.000	0.00	0.00	3.34	3.34	J-65	0.00	0.00	0.00	0.15	0.00	0.15	0.31	0.46	
334	EXISTING	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00	4.54	4.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
335	EXISTING	0.00	0.41	24	0.33	0.00	0.00	0.000	0.00	0.00	0.74	0.74	J-107	0.05	0.05	0.00	0.00	0.00	0.10	0.19	0.29	
336	EXISTING	0.00	0.00	0	0.00	0.00	2.58	0.000	0.00	0.00	2.58	2.58	J-2002	0.00	0.00	0.00	0.12	0.00	0.12	0.24	0.36	
337	EXISTING	3.75	0.00	134	0.00	0.00	0.00	0.000	0.00	0.01	3.76	3.75	110726	0.27	0.00	0.00	0.00	0.00	0.27	0.54	0.81	
338	EXISTING	0.09	1.96	115	0.00	0.00	0.00	0.000	0.00	0.00	2.05	2.05	399812	0.23	0.00	0.00	0.00	0.00	0.23	0.47	0.70	
339	EXISTING	0.00	0.00	0	4.60	0.00	0.00	0.000	0.00	0.00	4.60	4.60	J-3323	0.00	0.67	0.00	0.00	0.00	0.67	1.33	2.00	

Table A1: Existing Water Model Demands

AREA_ID	TIMING	RESIDENTIAL			NON-RESIDENTIAL						PARKS & OPEN SPACE (ha)	TOTAL AREA (ha)	WATER CONSUMMING AREA (ha)	Model Node Input Location	ADD					MDD	PHD
		LOW DENSITY RES (ha)	MED DENSITY RES (ha)	POPULATION	COMMERCIAL (ha)	CBD COMMERCIAL (ha)	INDUSTRIAL (ha)	INSTITUTIONAL (ha)	OTHER AND DC (ha)	Residential Flow (L/s)					Commercial Flow (L/s)	CBD Commercial Flow (L/s)	Industrial Flow (L/s)	Institutional Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)
340	EXISTING	5.49	0.00	196	0.00	0.00	0.00	0.000	0.00	0.86	6.36	5.49	J-1358	0.40	0.00	0.00	0.00	0.00	0.40	0.80	1.19
341	EXISTING	4.10	0.00	147	0.00	0.00	0.00	0.000	0.00	0.00	4.10	4.10	J-2064	0.30	0.00	0.00	0.00	0.00	0.30	0.59	0.89
342	EXISTING	1.81	0.00	64	0.00	1.50	0.00	0.000	0.00	0.00	3.31	3.31	J-2373	0.13	0.00	0.22	0.00	0.00	0.35	0.70	1.04
343	EXISTING	0.00	0.00	0	0.00	0.00	7.23	0.000	0.00	0.00	7.23	7.23	J-1584	0.00	0.00	0.00	0.33	0.00	0.33	0.67	1.00
344	EXISTING	0.00	0.00	0	0.00	0.00	3.09	0.000	0.00	0.00	3.09	3.09	J-133	0.00	0.00	0.00	0.14	0.00	0.14	0.29	0.43
345	EXISTING	0.00	0.00	0	0.00	0.00	1.84	0.000	0.00	0.00	1.84	1.84	J-1100	0.00	0.00	0.00	0.09	0.00	0.09	0.17	0.26
346	EXISTING	0.00	0.00	0	0.00	0.00	7.27	0.000	0.00	0.00	7.27	7.27	J-1106	0.00	0.00	0.00	0.34	0.00	0.34	0.67	1.01
347	EXISTING	0.00	0.00	0	0.00	0.00	6.83	0.000	0.00	0.00	6.83	6.83	366848	0.00	0.00	0.00	0.32	0.00	0.32	0.63	0.95
348	EXISTING	0.00	0.00	0	0.00	0.00	5.50	0.000	0.00	0.00	5.50	5.50	377340	0.00	0.00	0.00	0.25	0.00	0.25	0.51	0.76
349	EXISTING	0.00	0.00	0	0.00	0.00	1.45	0.000	0.00	0.00	1.45	1.45	377338	0.00	0.00	0.00	0.07	0.00	0.07	0.13	0.20
350	EXISTING	0.00	0.00	0	0.00	0.00	3.59	0.000	0.00	0.00	3.59	3.59	J-2309	0.00	0.00	0.00	0.17	0.00	0.17	0.33	0.50
351	EXISTING	0.00	0.00	0	0.00	0.00	0.95	0.000	0.00	0.00	0.95	0.95	J-270	0.00	0.00	0.00	0.04	0.00	0.04	0.09	0.13
352	EXISTING	0.00	0.00	0	0.00	0.00	2.94	0.000	0.00	0.00	2.94	2.94	J-3805	0.00	0.00	0.00	0.14	0.00	0.14	0.27	0.41
353	EXISTING	0.00	0.00	0	0.00	0.00	4.51	0.000	0.00	0.00	4.51	4.51	J-2416	0.00	0.00	0.00	0.21	0.00	0.21	0.42	0.63
354	EXISTING	8.60	0.00	307	0.02	0.00	0.00	0.000	0.00	0.42	9.04	8.62	J-1258	0.62	0.00	0.00	0.00	0.00	0.63	1.25	1.88
355	EXISTING	0.00	0.00	0	18.95	0.00	0.00	0.000	0.00	0.00	18.95	18.95	J-2137	0.00	2.74	0.00	0.00	0.00	2.74	5.48	8.23
356	EXISTING	0.00	0.00	0	0.00	0.00	0.00	0.000	0.00	4.69	4.69	0.00	J-2131	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
357	EXISTING	1.60	0.00	57	0.00	0.00	0.81	0.000	0.00	0.91	3.31	2.40	J-2130	0.12	0.00	0.00	0.04	0.00	0.15	0.31	0.46
358	EXISTING	0.00	0.67	38	0.00	0.77	0.62	0.000	0.00	0.00	2.06	2.06	J-2139	0.08	0.00	0.11	0.03	0.00	0.22	0.43	0.65
359	EXISTING	0.00	0.00	0	0.00	0.00	1.96	0.000	0.00	0.00	1.96	1.96	J-2116	0.00	0.00	0.00	0.09	0.00	0.09	0.18	0.27
360	EXISTING	0.00	0.00	0	0.00	0.00	1.17	0.000	0.00	0.00	1.17	1.17	J-54	0.00	0.00	0.00	0.05	0.00	0.05	0.11	0.16
361	EXISTING	0.00	0.00	0	0.00	0.00	4.47	0.000	0.00	0.00	4.47	4.47	J-2787	0.00	0.00	0.00	0.21	0.00	0.21	0.41	0.62
362	EXISTING	0.00	0.00	0	0.00	1.81	2.22	0.142	0.00	0.00	4.17	4.17	J-2372	0.00	0.00	0.26	0.10	0.01	0.37	0.75	1.12
363	EXISTING	0.00	0.00	0	0.00	2.59	0.00	0.000	0.00	0.00	2.59	2.59	J-17	0.00	0.00	0.37	0.00	0.00	0.37	0.75	1.12
364	EXISTING	0.00	0.00	0	0.00	0.11	1.35	0.000	0.00	0.00	1.46	1.46	J-2366	0.00	0.00	0.02	0.06	0.00	0.08	0.16	0.24
365	EXISTING	3.75	0.00	134	0.00	0.00	0.00	0.064	0.00	0.00	3.81	3.81	J-1226	0.27	0.00	0.00	0.00	0.00	0.28	0.55	0.83
366	EXISTING	0.00	0.42	24	0.87	0.00	0.00	0.000	0.00	0.00	1.29	1.29	J-2364	0.05	0.13	0.00	0.00	0.00	0.17	0.35	0.52
367	EXISTING	0.00	0.00	0	0.78	0.00	2.51	0.000	0.00	0.00	3.29	3.29	187566	0.00	0.11	0.00	0.12	0.00	0.23	0.46	0.69
369	EXISTING	0.00	0.00	0	0.00	0.00	3.44	0.000	0.00	0.00	3.44	3.44	J-3722	0.00	0.00	0.00	0.16	0.00	0.16	0.32	0.48
370	EXISTING	0.00	0.00	0	0.00	0.00	2.91	0.000	0.00	0.00	2.91	2.91	J-3659	0.00	0.00	0.00	0.13	0.00	0.13	0.27	0.40
371	EXISTING	0.01	0.00	0	0.65	0.85	0.00	0.000	0.00	0.00	1.51	1.51	J-2384	0.00	0.09	0.12	0.00	0.00	0.22	0.44	0.65
372	EXISTING	0.00	0.00	0	0.00	0.00	4.36	0.000	0.00	0.00	4.36	4.36	J-74	0.00	0.00	0.00	0.20	0.00	0.20	0.40	0.61
373	EXISTING	0.00	0.00	0	0.00	0.00	0.00	1.272	0.00	0.00	1.27	1.27	J-90	0.00	0.00	0.00	0.00	0.07	0.07	0.14	0.22
374	EXISTING	2.73	0.00	98	0.00	0.00	0.00	0.000	0.00	2.07	4.81	2.73	J-315	0.20	0.00	0.00	0.00	0.00	0.20	0.40	0.59
375	EXISTING	0.00	2.69	154	0.19	0.00	0.00	0.083	0.00	0.00	2.96	2.96	J-1220	0.31	0.03	0.00	0.00	0.00	0.34	0.69	1.03
376	EXISTING	0.96	1.20	103	0.00	0.00	0.00	0.030	0.00	0.18	2.36	2.19	J-1218	0.21	0.00	0.00	0.00	0.00	0.21	0.42	0.63
377	EXISTING	4.81	0.08	176	0.00	0.00	0.00	0.209	0.00	0.00	5.10	5.10	J-1214	0.36	0.00	0.00	0.00	0.01	0.37	0.74	1.11
378	EXISTING	0.27	1.96	122	0.20	0.00	0.00	0.450	0.20	0.05	2.94	2.89	J-109	0.25	0.03	0.00	0.00	0.03	0.30	0.60	0.90
379	EXISTING	2.22	0.00	79	0.00	0.00	0.00	0.000	0.00	0.11	2.33	2.22	J-111	0.16	0.00	0.00	0.00	0.00	0.16	0.32	0.48
380	EXISTING	3.91	0.00	140	0.00	0.00	0.00	0.000	0.00	0.01	3.92	3.91	J-2389	0.28	0.00	0.00	0.00	0.00	0.28	0.57	0.85
381	EXISTING	1.43	0.00	51	0.00	0.00	0.00	0.000	0.00	0.00	1.43	1.43	J-1202	0.10	0.00	0.00	0.00	0.00	0.10	0.21	0.31
382	EXISTING	1.81	0.00	65	0.00	0.00	0.00	0.000	0.00	0.00	1.81	1.81	J-119	0.13	0.00	0.00	0.00	0.00	0.13	0.26	0.39
383	EXISTING	0.25	0.85	57	0.00	0.00	0.00	0.700	0.00	0.00	1.80	1.80	J-108	0.12	0.00	0.00	0.00	0.04	0.16	0.31	0.47
384	EXISTING	5.97	0.00	213	0.00	0.00	0.00	0.000	0.00	0.00	5.97	5.97	J-2400	0.43	0.00	0.00	0.00	0.00	0.43	0.86	1.30
385	EXISTING	7.67	0.00	274	0.00	0.00	0.00	0.000	0.00	0.00	7.67	7.67	J-1298	0.56	0.00	0.00	0.00	0.00	0.56	1.11	1.67
386	EXISTING	0.06	2.25	131	0.00	0.00	0.00	1.183	0.00	1.79	5.29	3.50	J-161	0.27	0.00	0.00	0.00	0.07	0.33	0.66	1.00
387	EXISTING	6.12	0.00	219	0.00	0.00	0.00	0.000	0.00	0.00	6.12	6.12	J-1442	0.44	0.00	0.00	0.00	0.00	0.44	0.89	1.33
388	EXISTING	0.00	0.00	0	0.00	0.00	1.17	0.000	0.00	0.00	1.17	1.17	J-3814	0.00	0.00	0.00	0.05	0.00	0.05	0.11	0.16
389	EXISTING	0.00	0.00	0	0.00	0.00	1.70	0.000	0.00	0.00	1.70	1.70	J-86	0.00	0.00	0.00	0.08	0.00	0.08	0.16	0.24
390	EXISTING	0.00	0.00	0	0.00	0.00	2.15	0.000	0.00	0.00	2.15	2.15	J-86	0.00	0.00	0.00	0.10	0.00	0.10	0.20	0.30
391	EXISTING	0.00	0.00	0	1.60	0.00	0.00	0.000	0.00	0.00	1.60	1.60	J-307	0.00	0.23	0.00	0.00	0.00	0.23	0.46	0.69
392	EXISTING	0.00	0.00	0	1.77	0.00	0.00	0.000	0.00	0.00	1.77	1.77	J-88	0.00	0.26	0.00	0.00	0.00	0.26	0.51	0.77
393	EXISTING	2.45	0.00	88	0.00	0.00	0.00	0.000	0.00	0.00	2.45	2.45	J-1124	0.18	0.00	0.00	0.00	0.00	0.18	0.35	0.53
394	EXISTING	2.33	0.00	83	0.00	0.00	0.00	0.000	0.00	0.00	2.33	2.33	J-1126	0.17	0.00	0.00	0.00	0.00	0.17	0.34	0.51
395	EXISTING	3.55	0.00	127	0.00	0.00	0.00	0.000	0.00	0.00	3.55	3.55	J-1134	0.26	0.00	0.00	0.00	0.00	0.26	0.51	0.77
396	EXISTING	2.61	0.00	93	0.00	0.00	0.00	0.000	0.00	0.00	2.61	2.61	J-1138	0.19	0.00	0.00	0.00	0.00	0.19	0.38	0.57

Table A2: Future Water Model Demands

AREA_ID	TIMING	RESIDENTIAL			NON-RESIDENTIAL					PARKS & OPEN SPACE (ha)	TOTAL AREA (ha)	WATER CONSUMING AREA (ha)	Model Node Input Location	ADD					MDD	PHD	
		LOW DENSITY RES (ha)	MED DENSITY RES (ha)	POPULATION	COMMERCIAL (ha)	HWY COMMERCIAL (ha)	INDUSTRIAL (ha)	INSTITUTIONAL (ha)	OTHER AND DC (ha)					Residential Flow (L/s)	Commercial Flow (L/s)	HWY Commercial Flow (L/s)	Industrial Flow (L/s)	Institutional Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)
10144	3 YEAR			0	1.12						1.12	1.12	J-3951	0.00	0.19	0.00	0.00	0.00	0.19	0.39	0.58
10105	3 YEAR			0		6.11					6.11	6.11	J-3323	0.00	0.00	1.84	0.00	0.00	1.84	3.68	5.51
10118	3 YEAR			0		5.23					5.23	5.23	J-3153	0.00	0.00	1.57	0.00	0.00	1.57	3.15	4.72
10143	3 YEAR			0		7.31					7.31	7.31	J-3827	0.00	0.00	2.20	0.00	0.00	2.20	4.40	6.60
10146	3 YEAR			0		7.28					7.28	7.28	J-1798	0.00	0.00	2.19	0.00	0.00	2.19	4.38	6.57
10147	3 YEAR			0		4.21					4.21	4.21	J-1444	0.00	0.00	1.27	0.00	0.00	1.27	2.54	3.80
10066	3 YEAR			0			12.02				12.02	12.02	J-2187	0.00	0.00	0.00	1.39	0.00	1.39	2.78	4.17
10081	3 YEAR			0			14.69				14.69	14.69	188078	0.00	0.00	0.00	1.70	0.00	1.70	3.40	5.10
10093	3 YEAR			0			24.59				24.59	24.59	J-3953	0.00	0.00	0.00	2.85	0.00	2.85	5.69	8.54
10096	3 YEAR			0			31.55				31.55	31.55	369038	0.00	0.00	0.00	3.65	0.00	3.65	7.30	10.96
10100	3 YEAR			0			22.32				22.32	22.32	J-2152	0.00	0.00	0.00	2.58	0.00	2.58	5.17	7.75
10142	3 YEAR			0			1.54				1.54	1.54	J-2787	0.00	0.00	0.00	0.18	0.00	0.18	0.36	0.54
10063	3 YEAR	25.11		554							25.11	25.11	J-3910	1.60	0.00	0.00	0.00	0.00	1.60	3.21	4.81
10068	3 YEAR	10.28		227							10.28	10.28	J-1886	0.66	0.00	0.00	0.00	0.00	0.66	1.31	1.97
10072	3 YEAR	9.92		219							9.92	9.92	J-1938	0.63	0.00	0.00	0.00	0.00	0.63	1.27	1.90
10073	3 YEAR	1.24		27							1.24	1.24	J-3928	0.08	0.00	0.00	0.00	0.00	0.08	0.16	0.24
10084	3 YEAR	1.64		36							1.64	1.64	J-3929	0.10	0.00	0.00	0.00	0.00	0.10	0.21	0.31
10087	3 YEAR	1.02		22							1.02	1.02	J-3933	0.06	0.00	0.00	0.00	0.00	0.06	0.13	0.19
10088	3 YEAR	1.24		27							1.24	1.24	J-3932	0.08	0.00	0.00	0.00	0.00	0.08	0.16	0.24
10090	3 YEAR	14.42		318							14.42	14.42	J-3140	0.92	0.00	0.00	0.00	0.00	0.92	1.84	2.76
10101	3 YEAR	2.26		50							2.26	2.26	110726	0.14	0.00	0.00	0.00	0.00	0.14	0.29	0.43
10109	3 YEAR	3.66		81							3.66	3.66	J-3728	0.23	0.00	0.00	0.00	0.00	0.23	0.47	0.70
10114	3 YEAR	7.61		168							7.61	7.61	J-3713	0.49	0.00	0.00	0.00	0.00	0.49	0.97	1.46
10116	3 YEAR	4.22		93							4.22	4.22	J-3905	0.27	0.00	0.00	0.00	0.00	0.27	0.54	0.81
10148	3 YEAR	45.80		1,010							45.80	45.80	J-3937	2.92	0.00	0.00	0.00	0.00	2.92	5.85	8.77
10149	3 YEAR	45.80		1,010							45.80	45.80	J-1184	2.92	0.00	0.00	0.00	0.00	2.92	5.85	8.77
10121	3 YEAR		0.45	10							0.45	0.45	J-3929	0.03	0.00	0.00	0.00	0.00	0.03	0.06	0.09
10122	3 YEAR		0.47	10							0.47	0.47	J-3927	0.03	0.00	0.00	0.00	0.00	0.03	0.06	0.09
10126	3 YEAR		0.21	5							0.21	0.21	J-3931	0.01	0.00	0.00	0.00	0.00	0.01	0.03	0.04
10128	3 YEAR		2.99	66							2.99	2.99	J-3712	0.19	0.00	0.00	0.00	0.00	0.19	0.38	0.57
10129	3 YEAR		0.77	17							0.77	0.77	J-3939	0.05	0.00	0.00	0.00	0.00	0.05	0.10	0.15
10134	3 YEAR		4.30	95							4.30	4.30	J-3783	0.27	0.00	0.00	0.00	0.00	0.27	0.55	0.82
10135	3 YEAR		0.74	16							0.74	0.74	J-4016	0.05	0.00	0.00	0.00	0.00	0.05	0.09	0.14
10136	3 YEAR		0.33	7							0.33	0.33	399839	0.02	0.00	0.00	0.00	0.00	0.02	0.04	0.06
10145	3 YEAR		0.88	19							0.88	0.88	J-1390	0.06	0.00	0.00	0.00	0.00	0.06	0.11	0.17
10130	3 YEAR		5.29	117							5.29	5.29	J-3891	0.34	0.00	0.00	0.00	0.00	0.34	0.68	1.01
10133	3 YEAR		2.18	48							2.18	2.18	J-3994	0.14	0.00	0.00	0.00	0.00	0.14	0.28	0.42
3 YEAR SUBTOTAL		174.23	18.62	4,254	1.12	30.14	106.71	0.00	0.00	0.00	330.81	330.81		12.3	0.2	9.1	12.4	0.0	33.9	67.8	101.8
10080	5 YEAR			0	0.67						0.67	0.67	J-3823	0.00	0.12	0.00	0.00	0.00	0.12	0.23	0.35
10001	5 YEAR			0		28.51					28.51	28.51	J-3999	0.00	0.00	8.58	0.00	0.00	8.58	17.16	25.74
10070	5 YEAR			0		17.88					17.88	17.88	J-3998	0.00	0.00	5.38	0.00	0.00	5.38	10.76	16.14
10013	5 YEAR			0			3.12				3.12	3.12	J-4001	0.00	0.00	0.00	0.36	0.00	0.36	0.72	1.08
10065	5 YEAR			0			8.11				8.11	8.11	J-3925	0.00	0.00	0.00	0.94	0.00	0.94	1.88	2.82
10071	5 YEAR			0			18.15				18.15	18.15	J-3997	0.00	0.00	0.00	2.10	0.00	2.10	4.20	6.30
10106	5 YEAR			0			6.80				6.80	6.80	J-249	0.00	0.00	0.00	0.79	0.00	0.79	1.57	2.36
10108	5 YEAR			0			2.57				2.57	2.57	J-3934	0.00	0.00	0.00	0.30	0.00	0.30	0.60	0.89
10077	5 YEAR	45.80		902							45.80	45.80	J-195	2.61	0.00	0.00	0.00	0.00	2.61	5.22	7.83
10094	5 YEAR	25.59		504							25.59	25.59	J-2284	1.46	0.00	0.00	0.00	0.00	1.46	2.92	4.38
10110	5 YEAR	10.91		215							10.91	10.91	J-2273	0.62	0.00	0.00	0.00	0.00	0.62	1.24	1.87
10111	5 YEAR	27.42		540							27.42	27.42	J-1948	1.56	0.00	0.00	0.00	0.00	1.56	3.13	4.69
10124	5 YEAR		0.62	12							0.62	0.62	J-1962	0.04	0.00	0.00	0.00	0.00	0.04	0.07	0.11
10131	5 YEAR		1.98	39							1.98	1.98	J-2283	0.11	0.00	0.00	0.00	0.00	0.11	0.23	0.34
5 YEAR SUBTOTAL		109.72	2.60	2,213	0.67	46.39	38.76	0.00	0.00	0.00	198.13	198.13		6.4	0.1	14.0	4.5	0.0	25.0	49.9	74.9

Table A2: Future Water Model Demands

AREA_ID	TIMING	RESIDENTIAL			NON-RESIDENTIAL					PARKS & OPEN SPACE (ha)	TOTAL AREA (ha)	WATER CONSUMMING AREA (ha)	Model Node Input Location	ADD					MDD	PHD	
		LOW DENSITY RES (ha)	MED DENSITY RES (ha)	POPULATION	COMMERCIAL (ha)	HWY COMMERCIAL (ha)	INDUSTRIAL (ha)	INSTITUTIONAL (ha)	OTHER AND DC (ha)					Residential Flow (L/s)	Commercial Flow (L/s)	HWY Commercial Flow (L/s)	Industrial Flow (L/s)	Institutional Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)
10017	10 YEAR			0		6.02					6.02	6.02	J-4006	0.00	0.00	1.81	0.00	0.00	1.81	3.62	5.43
10023	10 YEAR			0		12.72					12.72	12.72	J-38	0.00	0.00	3.83	0.00	0.00	3.83	7.66	11.48
10046	10 YEAR			0		18.22					18.22	18.22	J-2195	0.00	0.00	5.48	0.00	0.00	5.48	10.97	16.45
10103	10 YEAR			0		11.80					11.80	11.80	J-2293	0.00	0.00	3.55	0.00	0.00	3.55	7.10	10.65
10011	10 YEAR			0			26.13				26.13	26.13	J-4005	0.00	0.00	0.00	3.02	0.00	3.02	6.05	9.07
10082	10 YEAR			0			11.26				11.26	11.26	J-188	0.00	0.00	0.00	1.30	0.00	1.30	2.61	3.91
10089	10 YEAR			0			7.93				7.93	7.93	J-249	0.00	0.00	0.00	0.92	0.00	0.92	1.84	2.75
10097	10 YEAR			0			61.62				61.62	61.62	J-3954	0.00	0.00	0.00	7.13	0.00	7.13	14.26	21.39
10137	10 YEAR			0			8.08				8.08	8.08	J-3926	0.00	0.00	0.00	0.94	0.00	0.94	1.87	2.81
10086	10 YEAR			0						42.66	42.66	0.00	J-249	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10098	10 YEAR			0						61.66	61.66	0.00	J-268	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10085	10 YEAR			0					39.44		0.00	0.00	J-4008	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10012	10 YEAR	13.87		455							13.87	13.87	J-2291	1.32	0.00	0.00	0.00	0.00	1.32	2.63	3.95
10022	10 YEAR	25.75		844							25.75	25.75	J-2287	2.44	0.00	0.00	0.00	0.00	2.44	4.88	7.33
10069	10 YEAR	16.71		548							16.71	16.71	J-1940	1.59	0.00	0.00	0.00	0.00	1.59	3.17	4.76
10078	10 YEAR	23.02		755							23.02	23.02	J-1966	2.18	0.00	0.00	0.00	0.00	2.18	4.37	6.55
10079	10 YEAR	14.61		479							14.61	14.61	J-1970	1.39	0.00	0.00	0.00	0.00	1.39	2.77	4.16
10091	10 YEAR	21.21		695							21.21	21.21	J-2246	2.01	0.00	0.00	0.00	0.00	2.01	4.02	6.04
10092	10 YEAR	37.71		1,236							37.71	37.71	J-2247	3.58	0.00	0.00	0.00	0.00	3.58	7.15	10.73
10123	10 YEAR		1.09	36							1.09	1.09	J-1962	0.10	0.00	0.00	0.00	0.00	0.10	0.21	0.31
10125	10 YEAR		5.52	181							5.52	5.52	J-1966	0.52	0.00	0.00	0.00	0.00	0.52	1.05	1.57
10127	10 YEAR		2.17	71							2.17	2.17	J-1970	0.21	0.00	0.00	0.00	0.00	0.21	0.41	0.62
10132	10 YEAR		7.62	250							7.62	7.62	J-4007	0.72	0.00	0.00	0.00	0.00	0.72	1.44	2.17
10 YEAR SUBTOTAL		152.89	16.40	5,549	0.00	48.76	115.02	0.00	39.44	104.32	437.38	333.06		16.1	0.0	14.7	13.3	0.0	44.0	88.1	132.1
10020	20 YEAR			0	3.00						3.00	3.00	J-2288	0.00	0.52	0.00	0.00	0.00	0.52	1.04	1.56
10021	20 YEAR			0	5.29						5.29	5.29	J-2288	0.00	0.92	0.00	0.00	0.00	0.92	1.84	2.76
10025	20 YEAR			0	6.82						6.82	6.82	J-3922	0.00	1.18	0.00	0.00	0.00	1.18	2.37	3.55
10026	20 YEAR			0		20.12					20.12	20.12	J-2293	0.00	0.00	6.05	0.00	0.00	6.05	12.11	18.16
10028	20 YEAR			0		1.71					1.71	1.71	J-3955	0.00	0.00	0.51	0.00	0.00	0.51	1.03	1.54
10029	20 YEAR			0		2.50					2.50	2.50	J-3948	0.00	0.00	0.75	0.00	0.00	0.75	1.50	2.25
10032	20 YEAR			0		5.05					5.05	5.05	J-2154	0.00	0.00	1.52	0.00	0.00	1.52	3.04	4.56
10040	20 YEAR			0		1.82					1.82	1.82	J-3920	0.00	0.00	0.55	0.00	0.00	0.55	1.09	1.64
10043	20 YEAR			0		4.02					4.02	4.02	J-3918	0.00	0.00	1.21	0.00	0.00	1.21	2.42	3.62
10054	20 YEAR			0		24.08					24.08	24.08	J-2198	0.00	0.00	7.25	0.00	0.00	7.25	14.49	21.74
10058	20 YEAR			0		5.63					5.63	5.63	J-2156	0.00	0.00	1.69	0.00	0.00	1.69	3.39	5.08
10062	20 YEAR			0		4.60					4.60	4.60	J-2336	0.00	0.00	1.38	0.00	0.00	1.38	2.77	4.15
10107	20 YEAR			0		14.48					14.48	14.48	J-1996	0.00	0.00	4.36	0.00	0.00	4.36	8.72	13.07
10074	20 YEAR			0			55.40				55.40	55.40	J-331	0.00	0.00	0.00	6.41	0.00	6.41	12.82	19.24
10095	20 YEAR			0			34.32				34.32	34.32	J-4013	0.00	0.00	0.00	3.97	0.00	3.97	7.94	11.92
10112	20 YEAR			0			62.01				62.01	62.01	J-184	0.00	0.00	0.00	7.18	0.00	7.18	14.35	21.53
10113	20 YEAR			0			8.06				8.06	8.06	J-3936	0.00	0.00	0.00	0.93	0.00	0.93	1.87	2.80
10115	20 YEAR			0			7.70				7.70	7.70	J-3826	0.00	0.00	0.00	0.89	0.00	0.89	1.78	2.67
10117	20 YEAR			0			3.11				3.11	3.11	J-3952	0.00	0.00	0.00	0.36	0.00	0.36	0.72	1.08
10120	20 YEAR			0						13.38	13.38	0.00	J-255	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10002	20 YEAR	31.66		1,066							31.66	31.66	J-2297	3.08	0.00	0.00	0.00	0.00	3.08	6.17	9.25
10003	20 YEAR	21.17		713							21.17	21.17	J-2299	2.06	0.00	0.00	0.00	0.00	2.06	4.12	6.19
10005	20 YEAR	52.09		1,753							52.09	52.09	J-2279	5.07	0.00	0.00	0.00	0.00	5.07	10.15	15.22
10014	20 YEAR	15.01		505							15.01	15.01	J-2295	1.46	0.00	0.00	0.00	0.00	1.46	2.92	4.39
10064	20 YEAR	39.63		1,334							39.63	39.63	J-2239	3.86	0.00	0.00	0.00	0.00	3.86	7.72	11.58
10076	20 YEAR	49.58		1,669							49.58	49.58	J-255	4.83	0.00	0.00	0.00	0.00	4.83	9.66	14.49
10083	20 YEAR	14.08		474							14.08	14.08	J-3865	1.37	0.00	0.00	0.00	0.00	1.37	2.74	4.12
10102	20 YEAR	45.47		1,531							45.47	45.47	J-2300	4.43	0.00	0.00	0.00	0.00	4.43	8.86	13.29
10104	20 YEAR	64.13		2,159							64.13	64.13	J-2301	6.25	0.00	0.00	0.00	0.00	6.25	12.49	18.74
20 YEAR SUBTOTAL		332.83	0.00	11,204	15.11	83.99	170.61	0.00	0.00	13.38	615.91	602.53		32.4	2.6	25.3	19.7	0.0	80.1	160.1	240.2

Table A2: Future Water Model Demands

AREA_ID	TIMING	RESIDENTIAL			NON-RESIDENTIAL					PARKS & OPEN SPACE (ha)	TOTAL AREA (ha)	WATER CONSUMMING AREA (ha)	Model Node Input Location	ADD					MDD	PHD	
		LOW DENSITY RES (ha)	MED DENSITY RES (ha)	POPULATION	COMMERCIAL (ha)	HWY COMMERCIAL (ha)	INDUSTRIAL (ha)	INSTITUTIONAL (ha)	OTHER AND DC (ha)					Residential Flow (L/s)	Commercial Flow (L/s)	HWY Commercial Flow (L/s)	Industrial Flow (L/s)	Institutional Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)
10010	40 YEAR			0	5.81						5.81	5.81		0.00	1.01	0.00	0.00	0.00	1.01	2.02	3.03
10024	40 YEAR			0	13.62						13.62	13.62		0.00	2.36	0.00	0.00	0.00	2.36	4.73	7.09
10057	40 YEAR			0	8.48						8.48	8.48		0.00	1.47	0.00	0.00	0.00	1.47	2.95	4.42
10008	40 YEAR			0		16.10					16.10	16.10		0.00	0.00	4.85	0.00	0.00	4.85	9.69	14.54
10033	40 YEAR			0		19.16					19.16	19.16		0.00	0.00	5.77	0.00	0.00	5.77	11.53	17.30
10034	40 YEAR			0		15.03					15.03	15.03		0.00	0.00	4.52	0.00	0.00	4.52	9.04	13.57
10037	40 YEAR			0		40.03					40.03	40.03		0.00	0.00	12.05	0.00	0.00	12.05	24.09	36.14
10038	40 YEAR			0		16.58					16.58	16.58		0.00	0.00	4.99	0.00	0.00	4.99	9.98	14.97
10039	40 YEAR			0		13.42					13.42	13.42		0.00	0.00	4.04	0.00	0.00	4.04	8.07	12.11
10041	40 YEAR			0		11.08					11.08	11.08		0.00	0.00	3.33	0.00	0.00	3.33	6.67	10.00
10049	40 YEAR			0		29.65					29.65	29.65		0.00	0.00	8.92	0.00	0.00	8.92	17.84	26.77
10006	40 YEAR			0			31.64				31.64	31.64		0.00	0.00	0.00	3.66	0.00	3.66	7.32	10.99
10015	40 YEAR			0			2.02				2.02	2.02		0.00	0.00	0.00	0.23	0.00	0.23	0.47	0.70
10027	40 YEAR			0			2.03				2.03	2.03		0.00	0.00	0.00	0.23	0.00	0.23	0.47	0.70
10031	40 YEAR			0			0.04				0.04	0.04		0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.02
10045	40 YEAR			0			21.86				21.86	21.86		0.00	0.00	0.00	2.53	0.00	2.53	5.06	7.59
10047	40 YEAR			0			60.92				60.92	60.92		0.00	0.00	0.00	7.05	0.00	7.05	14.10	21.15
10048	40 YEAR			0			62.58				62.58	62.58		0.00	0.00	0.00	7.24	0.00	7.24	14.49	21.73
10050	40 YEAR			0			57.72				57.72	57.72		0.00	0.00	0.00	6.68	0.00	6.68	13.36	20.04
10053	40 YEAR			0			59.31				59.31	59.31		0.00	0.00	0.00	6.86	0.00	6.86	13.73	20.59
10055	40 YEAR			0			29.02				29.02	29.02		0.00	0.00	0.00	3.36	0.00	3.36	6.72	10.08
10060	40 YEAR			0			23.36				23.36	23.36		0.00	0.00	0.00	2.70	0.00	2.70	5.41	8.11
10067	40 YEAR			0			38.76				38.76	38.76		0.00	0.00	0.00	4.49	0.00	4.49	8.97	13.46
10119	40 YEAR			0					32.69		0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10000	40 YEAR	46.79		1,450							46.79	46.79		4.19	0.00	0.00	0.00	0.00	4.19	8.39	12.58
10004	40 YEAR	57.40		1,778							57.40	57.40		5.14	0.00	0.00	0.00	0.00	5.14	10.29	15.43
10007	40 YEAR	41.56		1,287							41.56	41.56		3.73	0.00	0.00	0.00	0.00	3.73	7.45	11.18
10009	40 YEAR	25.18		780							25.18	25.18		2.26	0.00	0.00	0.00	0.00	2.26	4.51	6.77
10016	40 YEAR	8.09		251							8.09	8.09		0.72	0.00	0.00	0.00	0.00	0.72	1.45	2.17
10018	40 YEAR	11.79		365							11.79	11.79		1.06	0.00	0.00	0.00	0.00	1.06	2.11	3.17
10019	40 YEAR	40.45		1,253							40.45	40.45		3.63	0.00	0.00	0.00	0.00	3.63	7.25	10.88
10030	40 YEAR	2.04		63							2.04	2.04		0.18	0.00	0.00	0.00	0.00	0.18	0.37	0.55
10035	40 YEAR	24.99		774							24.99	24.99		2.24	0.00	0.00	0.00	0.00	2.24	4.48	6.72
10036	40 YEAR	31.80		985							31.80	31.80		2.85	0.00	0.00	0.00	0.00	2.85	5.70	8.55
10042	40 YEAR	64.07		1,985							64.07	64.07		5.74	0.00	0.00	0.00	0.00	5.74	11.48	17.23
10044	40 YEAR	20.73		642							20.73	20.73		1.86	0.00	0.00	0.00	0.00	1.86	3.72	5.57
10051	40 YEAR	60.01		1,859							60.01	60.01		5.38	0.00	0.00	0.00	0.00	5.38	10.76	16.14
10052	40 YEAR	49.35		1,529							49.35	49.35		4.42	0.00	0.00	0.00	0.00	4.42	8.85	13.27
10056	40 YEAR	40.76		1,263							40.76	40.76		3.65	0.00	0.00	0.00	0.00	3.65	7.31	10.96
10059	40 YEAR	45.07		1,396							45.07	45.07		4.04	0.00	0.00	0.00	0.00	4.04	8.08	12.12
10061	40 YEAR	52.22		1,618							52.22	52.22		4.68	0.00	0.00	0.00	0.00	4.68	9.36	14.04
10075	40 YEAR	63.35		1,962							63.35	63.35		5.68	0.00	0.00	0.00	0.00	5.68	11.36	17.03
10099	40 YEAR	29.49		914							29.49	29.49		2.64	0.00	0.00	0.00	0.00	2.64	5.29	7.93
40 YEAR SUBTOTAL		715.15	0.00	22,153	27.91	161.04	389.27	0.00	32.69	0.00	1293.37	1293.37		64.1	4.8	48.5	45.1	0.0	162.5	324.9	487.4

Table A2: Future Water Model Demands

AREA_ID	TIMING	RESIDENTIAL			NON-RESIDENTIAL						PARKS & OPEN SPACE (ha)	TOTAL AREA (ha)	WATER CONSUMMING AREA (ha)	Model Node Input Location	ADD					MDD	PHD
		LOW DENSITY RES (ha)	MED DENSITY RES (ha)	POPULATION	COMMERCIAL (ha)	HWY COMMERCIAL (ha)	INDUSTRIAL (ha)	INSTITUTIONAL (ha)	OTHER AND DC (ha)	Residential Flow (L/s)					Commercial Flow (L/s)	HWY Commercial Flow (L/s)	Industrial Flow (L/s)	Institutional Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)	Total Flow (L/s)
10138	>40 YEAR			0			59.47				59.47	59.47		0.00	0.00	0.00	6.88	0.00	6.88	13.77	20.65
10139	>40 YEAR			0			33.15				33.15	33.15		0.00	0.00	0.00	3.84	0.00	3.84	7.67	11.51
10140	>40 YEAR			0			9.78				9.78	9.78		0.00	0.00	0.00	1.13	0.00	1.13	2.26	3.40
10141	>40 YEAR			0			1.11				1.11	1.11		0.00	0.00	0.00	0.13	0.00	0.13	0.26	0.39
>40 YEAR SUBTOTAL		0.00	0.00	0	0.00	0.00	103.50	0.00	0.00	0.00	103.50	103.50		0.0	0.0	0.0	12.0	0.0	12.0	24.0	35.9
Total Future		1484.8	37.6	45,373	44.8	370.3	923.9	0.0	72.1	117.7	2979.1	2861.4		131.3	7.8	111.4	106.9	0.0	357.4	714.9	1072.3
Total Existing (Table A1)		751.7	99.0	32,515	149.0	62.7	503.6	120.8	12.2	77.2	1763.9	1686.7		65.9	21.6	9.1	23.3	6.9	126.7	253.3	380.0
Ultimate Total		2236.5	136.7	77,888	193.8	433.0	1427.4	120.8	84.3	194.9	4743.0	4548.1		197.2	29.3	120.5	130.2	6.9	484.1	968.2	1452.3
																			41,825	83,650	125,475

Proposed Lloyd Design Standards (2015 MP) - For Future Demands:

Residential

ADD 250 L/cap/day
MDD 2 x ADD
PHD 3 x ADD

Non-Residential

Local Commercial 15,000 L/ha/day
Highway Commercial 26,000 L/ha/day
Light Industrial 10,000 L/ha/day
Heavy Industrial 20,000 L/ha/day
Institutional - Schools 10,000 L/ha/day

Populations from Growth Projections

Horizon	Year	Population
3 Year	2018	36,769
5 Year	2020	38,982
10 Year	2025	44,531
20 Year	2035	55,735
40 Year	2055	77,888

Population Densities to Meet Future Populations based on Residential Land Areas from the Growth Projections

3 Year	22 people/gross ha
5 Year	20 people/gross ha
10 Year	33 people/gross ha
20 Year	34 people/gross ha
40 Year	31 people/gross ha



Appendix B
Fire Flow Testing Reports (SFE Global)





To:	City of Lloydminster	Date:	April 14, 2015
Attention:	Craig Anderson, Project Lead, Utilities Branch	Project No:	14228
Reference:	Lloydminster Water Master Plan - Hydrant Flow Testing		
From:	Barry Raynard		

On October 15 and 16, 2014, representatives of ISL Engineering and Land Services (ISL) and SFE Global (SFE) and the City of Lloydminster conducted hydrant flow tests in preparation for the water distribution system model calibration. The tests were conducted under the direction of Ken Urban who was in constant communications with the Water Treatment Plant (WTP) staff and the City's distribution staff who operated the hydrants. The WTP staff noted the pumping rate, discharge header pressure and pump operation (Pump # and VFD setting) at the WTP pumphouse and the West Reservoir (WR). Inder Lakhian of SFE oversaw the set up and operation of the hydrant flow test equipment. Barry Raynard and Dylan Serbin of ISL provided on-site direction for test locations / objectives and recorded the test results.

The hydrant flow test locations are shown in Figure 1. The flow hydrant and monitoring hydrant numbers and street addresses are listed in Table 1. The SFE report on the hydrant flow testing is attached.

Table 1. Hydrant Flow Test Locations

Test #	Flow Hydrant #	Flow Hydrant Location	Monitoring Hydrant #	Monitoring Hydrant Location	Comments
1	304	65 St & 52 Ave, NW corner of Int.	275	East of 304, along 65 St	
2a	495	52 St & 63 Ave, NW corner of Int.	542	North of 495, West side of 63 Ave	all valves open
2b	495	52 St & 63 Ave, NW corner of Int.	542	North of 495, West side of 63 Ave	close valve immediately east of 63 Ave on 52 St
3	35	51 St & 57 Ave, West of 57 Ave along 51st	45	50 St & 58 Ave, NE Corner of Int.	
4	85	48 St & 47 Ave, NW corner of Int.	84	48 St & 48 Ave, NW corner of Int.	
5	113	46 St & 48 Ave, NW corner of Int.	114	46 St & 47 Ave, NW corner of Int.	
6	208	39 ST & 56 Ave, NE of Int.	262	Along 39 St and west of 53 Ave	
7	411	41 St & West of 37 Ave	410P	41 St & 37 Ave	
8	727	24 St & 46 Ave, SW corner of "T" Int.	728	23 St & 46 Ave, SW corner of "T" Int.	
9	435	28 St & 57B Ave, S of 28 St, N of cul-de-sac	434	South along 57B Ave, 4 lots before 26 St	



For each test the following procedure was used:

1. The hydrant flow test equipment was installed at the flow hydrant and the adjacent monitoring hydrant.
2. At the WTP the pumping rate, discharge header pressure and pump operation was recorded immediately prior to the test, along with the WR inflow rate and pressure. At the same time the pressure at the monitoring hydrant was recorded.
3. The hydrant was then slowly opened and the flows and pressures were allowed to stabilize. To avoid the WR pumps from operating, the WTP pumps were ramped up by WTP staff to maintain close to the original discharge pressure.
4. When the flows and pressures had stabilized, the Pitot pressure was measured at the flow hydrant, and the residual pressure in the monitoring hydrant was recorded. At the same time the WTP pumping rate, discharge header pressure and pump operation was recorded, along with the WR inflow rate and pressure.
5. The hydrant was slowly closed (to avoid inducing hydraulic transients) and the equipment removed.
6. The flows, pressures, etc. were recorded following the test.

In addition to the above, SFE / City installed pressure meters with data loggers on three hydrants located within the distribution system. These were left turned on throughout the testing and were downloaded. The three locations and their hydrant numbers are shown in Table 2. The output from the data loggers is included in the attached SFE report.

Table 2. Pressure Meter Data Logger Locations

Data logger	Location	Hydrant #
1	25 St & 1 block west of 50 Ave	602
2	62 St & 53 Ave	766
3	51 St & 49 Ave	44

The need to manually ramp up the WTP pumps was recognized during the first test. Initially the WTP pumps were allowed to respond normally, which resulted in a loss of system pressure when the flow hydrant was opened. This caused the fill valve at the WR to close, and one of the WR pumps was engaged. As a result of the time required for the WR fill valve to close and the pump to start, it took approximately 3 to 5 minutes for the system pressures to stabilize. As a result, the decision was made to manually ramp up the WTP pumps to maintain a similar or higher discharge pressure coming out of the WTP during each test including a re-run of Test #1.

The City's water distribution system was operating normally during the test with the exception of the 300mm main on 52 Street. This main, which is one of the primary lines feeding the WR, was out of service between 53 and 55 Avenues as Husky was conducting maintenance/repairs at their tie-in to this main. It was noted prior to testing that the ADM canola plant occasionally withdraws large quantities of water for their operations. It was estimated that they withdraw up to 150 m³/hour for a short duration (e.g. 20 minutes), which could impact the hydrant flow tests.

Test #2 had a secondary objective of assessing the 300mm and 400mm mains feeding the WR. As the 300mm main on 52 Street was out of service, the scope of this test was reduced slightly. The first part of this test (#2A) was similar to the other hydrant flow tests. For Test #2B, the isolation valve in the southeast corner of 52 Street and 63 Avenue was closed to force all of the flows to be routed through the 400mm main.

As a quality control check, the net change in inflow rates from the WTP and WR was compared to the calculated hydrant flow rates for each test. The net change was calculated by determining the increase in WTP pumping rates (positive in all cases) and adding any reduction in the WR inflow rates (subtracted if WR inflow increased due to higher WTP discharge pressures). The results of these checks are shown in the attached Table 3. Comparing the hydrant flows with the net pumping difference, the values are generally similar (within ~25%) which is acceptable. The exception is Test 4 where the hydrant flows were only 50% of the net pumping difference, so that test result should be used with caution.

Table 3 also includes the flow readings at the WTP, WR and monitoring hydrant that will be used for model calibration. The pressures at the WTP discharge header, WR and monitoring hydrant during the tests are presented in Table 4. The data is considered suitable for the calibration of the water model.



Table 3. Hydrant Flow Test Results - Hydrant Flows vs. Change in WTP / WR Flows

Test #	Hydrant Flow (igpm)	Hydrant Flow (L/s)	WTP				West Reservoir				Net Pumping Diff (L/s)
			Q static (m3/hr)	Q flow (m3/hr)	Diff (m3/hr)	Diff (L/s)	Q static (m3/hr)	Q flow (m3/hr)	Diff (m3/hr)	Diff (L/s)	
1	1383	105	662	1066	404	112	219	234	15	4	108
2a	1129	86	662	855	193	54	212	148	-64	-18	71
2b	1107	84	588	862	274	76	158	128	-30	-8	84
3	1062	80	725	970	245	68	88	32	-56	-16	84
4	511	39	691	913	222	62	162	168	6	2	60
5	957	73	684	907	223	62	143	54	-89	-25	87
6	1192	90	682	972	290	81	137	0	-137	-38	119
7	1346	102	673	968	295	82	166	0	-166	-46	128
8	929	70	675	904	229	64	185	97	-88	-24	88
9	1107	84	678	930	252	70	128	0	-128	-36	106

Table 4. Hydrant Flow Test Results - Pressure Measurements

Test #	Monitoring Hydrant		Monitoring Hydrant		WTP		West Reservoir	
	Static Pressure (psi)	Flow Pressure (psi)	Static Pressure (kPa)	Flow Pressure (kPa)	Static Pressure (kPa)	Flow Pressure (kPa)	Static Pressure (kPa)	Flow Pressure (kPa)
1	86	73	593	504	657	678	294	293
2a	59	55	407	380	662	685	295	294
2b	69	53	476	366	693	682	292	296
3	60	56	414	386	636	692	294	295
4	74	40	511	276	648	694	294	295
5	75	54	518	373	650	683	292	300
6	57.5	54	397	373	654	701	295	284
7	81	71	559	490	653	694	294	293
8	63	40	435	273	654	696	295	297
9	51	49	352	338	653	700	295	276

Note:

1. Possible ADM flow is 150 m³/hr or 42 L/s.

Final Report for
ISL Engineering and Land Services Ltd.

Attn: Mr. Barry Raynard M.Eng., P.Eng.

Lloydminster, Alberta
2014 Fire Hydrant Flow Testing



Prepared and submitted by:

SFE Global
10707 - 181th Street
Edmonton, Alberta T5S 1N3
Phone (780) 461-0171 Fax (780) 443-4613
Toll Free: 1-877-293-0173



November 17, 2014

Mr. Barry Raynard M.Eng., P.Eng.,

ISL Engineering and Land Services Ltd.

7909 – 51 Avenue

Edmonton, AB. T6E 5L9

FINAL REPORT: 2014 Fire Hydrant Flow Testing
Lloydminster, Alberta

Dear Mr. Raynard;

Please find enclosed SFE's Final Report for the above mentioned project. If you have any questions, comments or concerns, please do not hesitate to contact us at your earliest convenience.

Thank you for having SFE conduct this work on your behalf. We are appreciative of the opportunity to work with you and your team on this project. We look forward to working together again in the near future.

Sincerely,
SFE Global

Nick Schellenberg
General Manager, Prairies
(780) 461-0171
Nick.schellenberg@sfeglobal.com
www.SFEGlobal.com

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY4

2. SUMMARY OF TESTING4

3. DATA5

4. SAFETY6

5. APPENDICES.....6

- Appendix I.....7

Pressure Logger Data7

- Appendix II..... 11

Test Results 11

1. Executive Summary

This report provides details of the hydrant fire flow testing conducted in Lloydminster, Alberta. SFE Global was retained by ISL under the direction of Mr. Barry Raynard M.Eng., P.Eng. Mr. Nick Schellenberg represented SFE Global as Project Manager during this project.

As requested, SFE conducted ten (10) hydrant fire flow tests on October 15th and 16th, 2014. All flow hydrants and test hydrants were indicated to SFE by maps supplied by the client. The fire flow tests were conducted according to National Fire Protection Association (NFPA) 291 standards.

2. Summary of Testing

SFE Technicians met representatives of the City of Lloydminster and ISL on site to perform testing on October 15th, 2014. The testing plan was discussed and location maps reviewed by all participants.

Testing Equipment

Testing was performed on flow hydrants 1-3, and 5-9; utilizing a Hydro Flow Products Inc. 4" Hose Monster system with integral de-chlorinator.

Testing was performed on flow hydrant 4 utilizing a combination of Hydro Flow Product Inc. – 1 ¼ inch Pitot-less Nozzle and Hydro Flow Products Inc. 2.5" Hose Monster system with integral de-chlorinator.

These are fixed pitot devices to measure flow, de-chlorinate and diffuse in one process. The benefit of this system is the ability to provide repeatable results and manage discharge water conditions.

Residual pressure was measured with a liquid filled Bourdon tube type pressure gauge. Pitot pressure readings were also obtained from liquid filled, Bourdon tube pressure gauges.

The configuration for the 4" Hose Monster System consisted of one (1) 4 inch hose monster on the 4" port of the Flow hydrant. Pressure recording gauges were installed on the designated residual pressure hydrant.

The configuration for the 2.5" Hose Monster System consisted of one (1) 2.5 inch hose monster on the 2.5" port of the Flow hydrant. Pressure recording gauges were installed on the designated residual pressure hydrant.

The configuration for the 1 ¼ inch Pitotless Nozzle consisted of one (1) 1 ¼ inch Hose Monster Pitotless Nozzle on the 2.5" port of the Flow Hydrant. Pressure recording gauges were installed on the designated residual pressure hydrant.

To digitally log pressure within the distribution system SFE Technicians installed three (3) Telog HPR hydrant pressure loggers. These devices were set to one minute logging intervals and one second sampling intervals. Each one minute interval logs the minimum, maximum and average pressure for that interval.

Testing Procedure

The client selected all flow hydrants and the digital logging hydrant, while SFE Crews selected a residual hydrant for each test. SFE Technicians installed flow testing equipment on each flow hydrant and residual pressure measurement equipment on the residual hydrant.

The tests were performed by recording system static pressure then flowing the 2.5 inch port on the Flow hydrant. Once fire pumps activated and the pressure and flow stabilized all flow and residual pressures were recorded. Total flow and extrapolated flow to 20 psi residual pressure are calculated from this test on the flow testing summary sheets.

Flow testing summary sheets are included in Appendix I.

A data logger was installed to measure min, max and average system pressure. The location of this device was:

L1 Outside of Pump Shack – Corner of 2nd Street East and 1st Avenue

A graph of the data from this locations is included in Appendix I.

3. Data

The testing reports included in Appendix I contain all test results and photos. All pressure readings are in psi and all flow values are reported in IGPM. All hydrants were returned to as found condition upon completion of testing.

Please find the testing results Appendix I and a drawing of the test sites as provided by the client in Appendix II.

4. Safety

A pre-job safety inspection and meeting was conducted by SFE personnel, and the following potential hazards were identified:

- Need for Personal Protective Equipment
- Working with water under pressure
- Pedestrian and vehicular traffic conditions
- Safe operation and shut down of fire hydrants

This project was conducted in accordance with the WCB and OSHA safety standards as documented in SFE's Safety Procedures Manual. The SFE crew reviewed the work to be completed and safety requirements at a tail-gate safety meeting held prior to commencing work.

Report End
September 2014

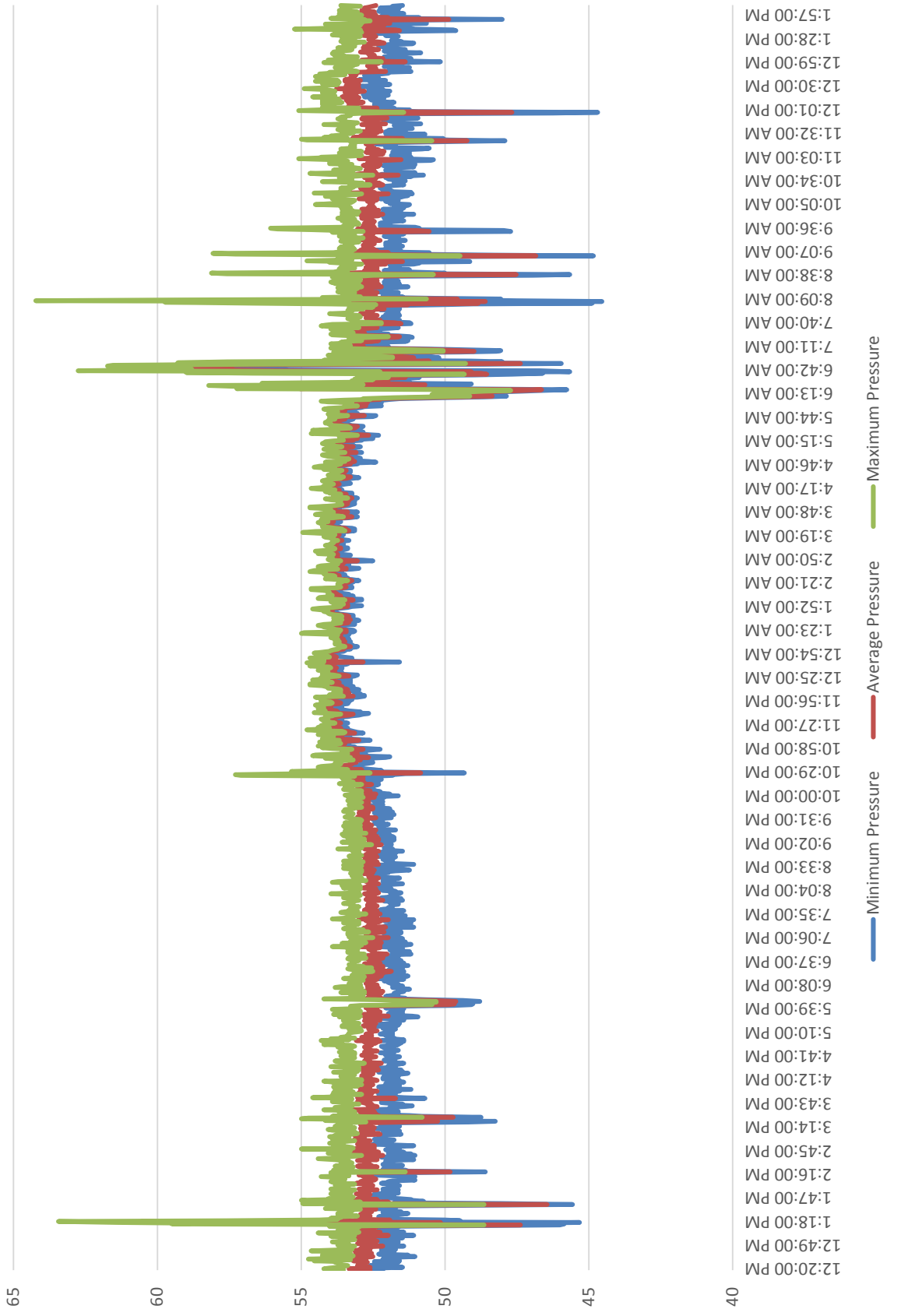
SFE Global
Project A14-171

5. Appendices

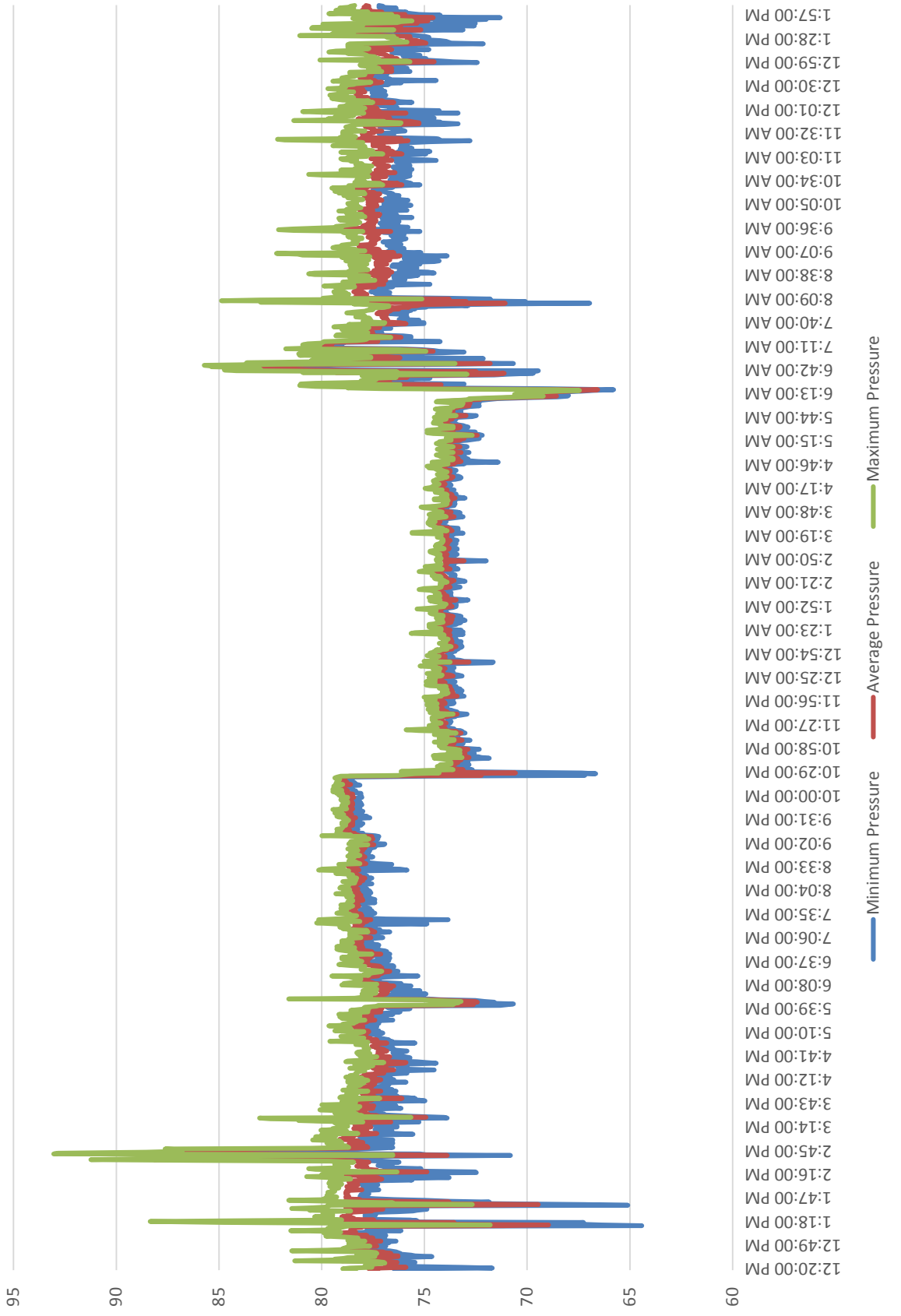
Appendix I

Pressure Logger Data

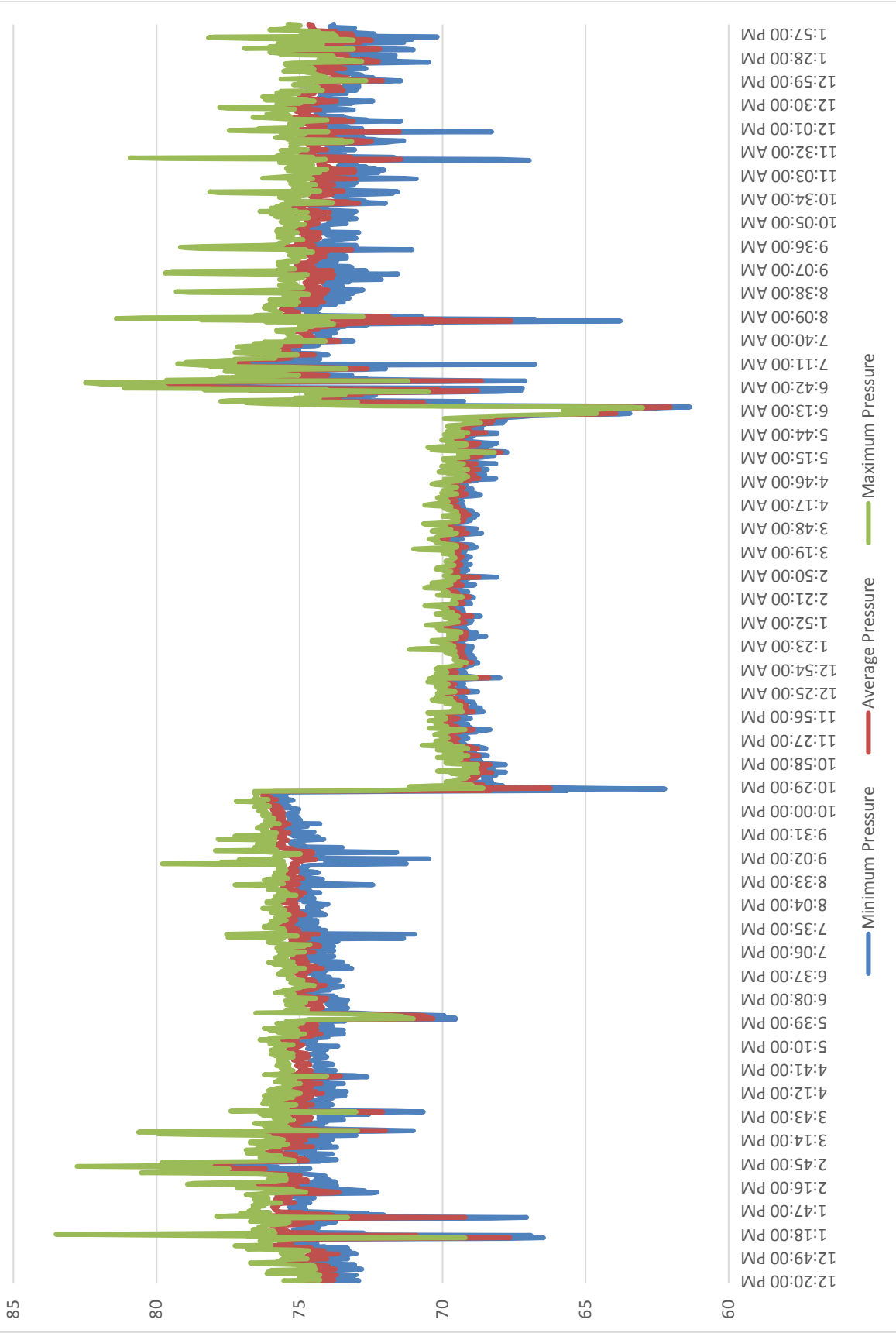
Logger 1 - Hydrant #602 - Residual Pressure



Logger 2 - Hydrant #766 - Residual Pressure



Logger 3 - Hydrant #44 - Residual Pressure



Appendix II Test Results



GLOBAL



Fire Flow Test Report

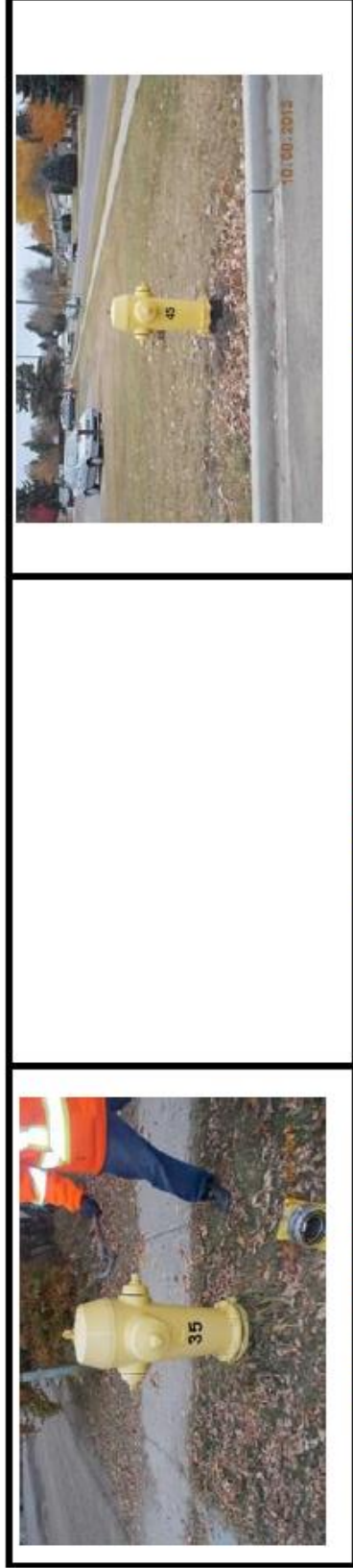
Client Name:	ISL Engineering	Hyd 1 - #/Port Size	1 - 4"	Flow Hyd 1 Addr.	51 Street & West of 57 Avenue
Project Location:	Lloyminster, AB/SK	Hyd 2 - #/Port Size	4" HM	Flow Hyd 2 Addr.	50 Street & 58 Ave (NE Corner)
SFE Project #:	A14-171	Hyd 1 - Pito Types	NFPA 291	Resid Hyd Addr.	Auto
SFE Technicians:	Inder Lakhian Jake Fushley	Hyd 2 - Pito Types		Fire Pump Status	Force On
		Test Procedure		(circle one)	

Test ID: A14-171-04 Test: 3 of 9 Date: 15-Oct-14

Start Time	End Time	Flow Hyd 1		Flow Hyd 2		Residual Hydrant		Static	psi	Static	psi
		Port 1-1	Port 1-2	Port 2-1	Port 2-2	Static	Residual				
15:20	15:25	12				60.5	55.5	61			

Flow Summary (igpm)	
Flow 1-1	1085
Flow 1-2	
Flow 2-1	
Flow 2-2	
Total Flow	1085
Flow @ 20 psi	3357

Notes:



Flow Hydrant #35 GPS N53.28360 W110.02891

Flow Hydrant 2 GPS N53.28358 W110.02891

Residual Hydrant #45

Fire Flow Test Report

Client Name:	ISL Engineering	Hyd 1 - #/Port Size	1 - 2.5"	Flow Hyd 1 Addr.	48 Street & 47 Ave (NW Corner)
Project Location:	Lloyminster, AB/SK	Hyd 2 - #/Port Size	1 - 2.5"	Flow Hyd 2 Addr.	
SFE Project #:	A14-171	Hyd 1 - Pito Types	1.75" Green HM	Resid Hyd Addr.	48 Street & 48 Ave (NW Corner)
SFE Technicians:	Inder Lakhian	Hyd 2 - Pito Types	2.5" HM	Fire Pump Status	Auto
	Jake Fushthey	Test Procedure	NFPA 291	(circle one)	Force On

Test ID: **A14-171-09** Test: **4** of **9** Date: **16-Oct-14**

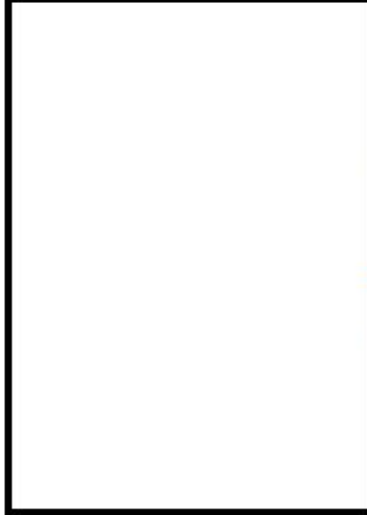
Start Time	Flow Hyd 1		Flow Hyd 2		Residual Hydrant	
	Port 1-1 psi	Port 1-2 psi	Port 2-1 psi	Port 2-2 psi	Static psi	Residual psi
11:10	15.5				74	50
					74	74
11:22	5	4			74	40
					73	

Flow Summary (igpm)	
Test 1 - Port 1	349
Flow @ 20 psi	541
Test 2 - Port 1	323
Test 2 - Port 2	188
Test 2 - Total	511
Flow @ 20 psi	656

Notes:



Flow Hydrant #85
GPS N53.28168 W110.99759



Flow Hydrant 2
GPS



Residual Hydrant #84
GPS N53.281677 W110.00621

Final Report for
ISL Engineering and Land Services

Attn: Ms. Angela Steward

Lloydminster, Alberta
2015 Fire Hydrant Flow Testing



Prepared and submitted by:

SFE Global
10707 - 181th Street
Edmonton, Alberta T5S 1N3
Phone (780) 461-0171 Fax (780) 443-4613
Toll Free: 1-877-293-0173



July 22, 2015

Ms. Angela Steward M.Eng., P.Eng., LEED® AP
Water Resources Engineer

ISL Engineering and Land Services

7909 – 51 Avenue
Edmonton, AB
T6E 5L9

FINAL REPORT: 2015 Fire Hydrant Flow Testing
Lloydminster, Alberta

Dear Mr. Peterson;

Please find enclosed SFE's Final Report for the above mentioned project. If you have any questions, comments or concerns, please do not hesitate to contact us at your earliest convenience.

Thank you for having SFE conduct this work on your behalf. We are appreciative of the opportunity to work with you and your team on this project. We look forward to working together again in the near future.

Sincerely,
SFE Global

Nick Schellenberg
Project Manager - Prairies
(780) 461-0171
Nick.schellenberg@sfeglobal.com
www.sfeonline.com

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY4

2. SUMMARY OF TESTING4

3. DATA5

4. SAFETY6

5. APPENDICES6

- Appendix I 7

Pressure Logger Data7

- Appendix II 10

Test Results 10

1. Executive Summary

This report provides details of the hydrant fire flow testing conducted in Lloydminster, Alberta. SFE Global was retained by ISL under the direction of Mr. Jonathan Peterson P.Eng. Mr. Kevin McMillan represented SFE Global as Project Manager during this project.

As requested, SFE conducted ten (10) hydrant fire flow tests on October 15th and 16th, 2014. All flow hydrants and test hydrants were indicated to SFE by maps supplied by the client. The fire flow tests were conducted according to National Fire Protection Association (NFPA) 291 standards.

2. Summary of Testing

SFE Technicians met representatives of the City of Lloydminster and ISL on site to perform testing on July 9th, 2015. The testing plan was discussed and location maps reviewed by all participants.

Testing Equipment

Testing was performed on flow hydrants A, B, C, and E; utilizing a Hydro Flow Products Inc. 4" Hose Monster system with integral de-chlorinator.

Testing was performed on flow hydrant D utilizing a 2.5" Hose Monster system with integral de-chlorinator.

These are fixed pitot devices to measure flow, de-chlorinate and diffuse in one process. The benefit of this system is the ability to provide repeatable results and manage discharge water conditions.

Residual pressure was measured with a liquid filled Bourdon tube type pressure gauge. Pitot pressure readings were also obtained from liquid filled, Bourdon tube pressure gauges.

The configuration for the 4" Hose Monster System consisted of one (1) 4 inch hose monster on the 4" port of the Flow hydrant. Pressure recording gauges were installed on the designated residual pressure hydrant.

The configuration for the 2.5" Hose Monster System consisted of one (1) 2.5 inch hose monster on the 2.5" port of the Flow hydrant. Pressure recording gauges were installed on the designated residual pressure hydrant.

To digitally log pressure within the distribution system SFE Technicians installed two (2) Telog HPR hydrant pressure loggers. These devices were set to one minute logging intervals and one second sampling intervals. Each one minute interval logs the minimum, maximum and average pressure for that interval.

Testing Procedure

The client selected all flow hydrants and the digital logging hydrants, while SFE Crews selected a residual hydrant for each test. SFE Technicians installed flow testing equipment on each flow hydrant and residual pressure measurement equipment on the residual hydrant.

The tests were performed by recording system static pressure then flowing the 2.5 inch port on the Flow hydrant. Once fire pumps activated and the pressure and flow stabilized all flow and residual pressures were recorded. Total flow and extrapolated flow to 20 psi residual pressure are calculated from this test on the flow testing summary sheets.

Flow testing summary sheets are included in Appendix I.

A data logger was installed to measure min, max and average system pressure. The location of this device was:

L1 South West of Intersection 50th Avenue and 52nd Street
L2 6700 56th Street

A graph of the data from this locations is included in Appendix I.

3. Data

The testing reports included in Appendix I contain all test results and photos. All pressure readings are in psi and all flow values are reported in IGPM. All hydrants were returned to as found condition upon completion of testing.

Please find the testing results Appendix I and a drawing of the test sites as provided by the client in Appendix II.

4. Safety

A pre-job safety inspection and meeting was conducted by SFE personnel, and the following potential hazards were identified:

- Need for Personal Protective Equipment
- Working with water under pressure
- Pedestrian and vehicular traffic conditions
- Safe operation and shut down of fire hydrants

This project was conducted in accordance with the WCB and OSHA safety standards as documented in SFE's Safety Procedures Manual. The SFE crew reviewed the work to be completed and safety requirements at a tail-gate safety meeting held prior to commencing work.

Report End
July 2015

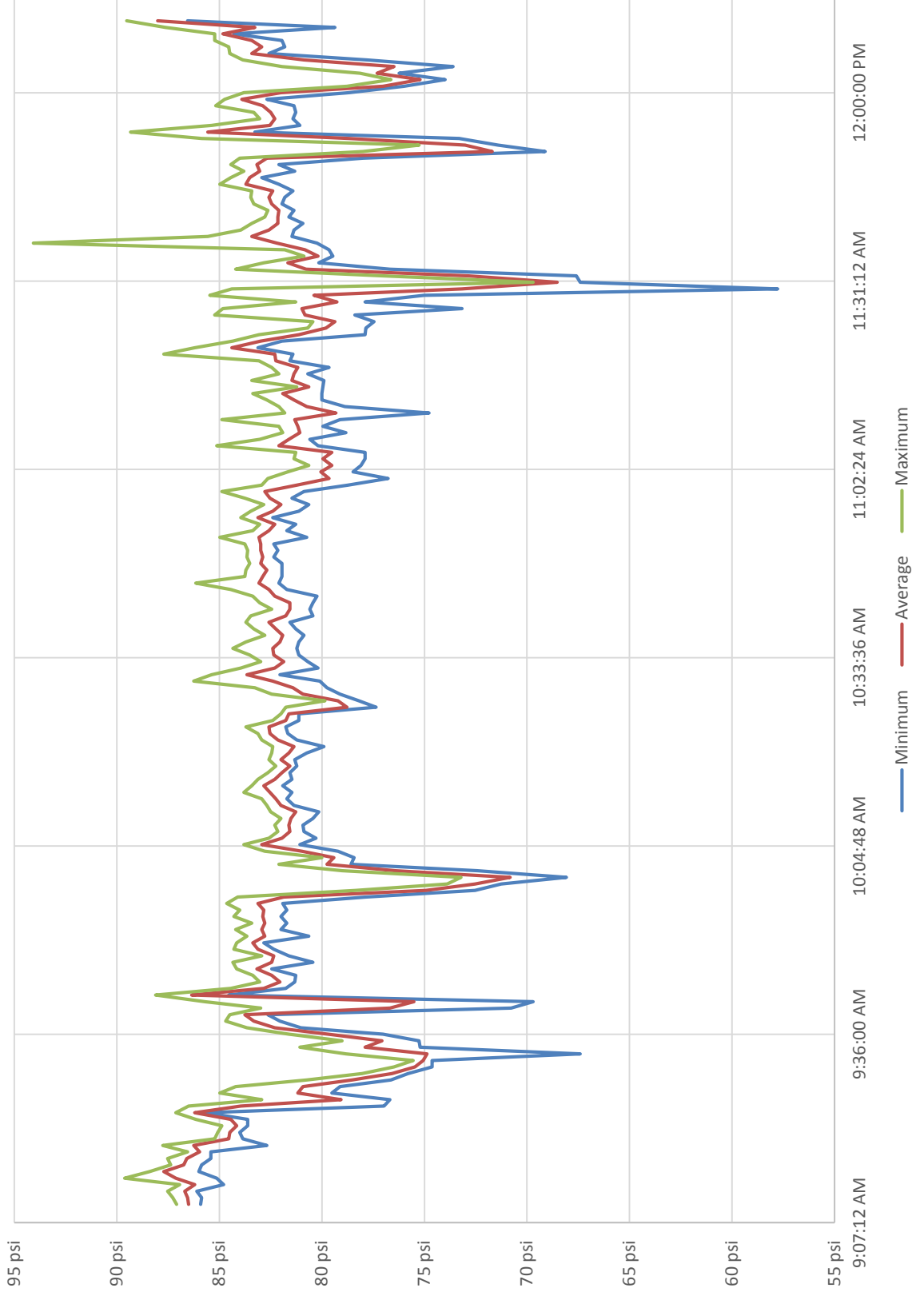
SFE Global
Project A15-136

5. Appendices

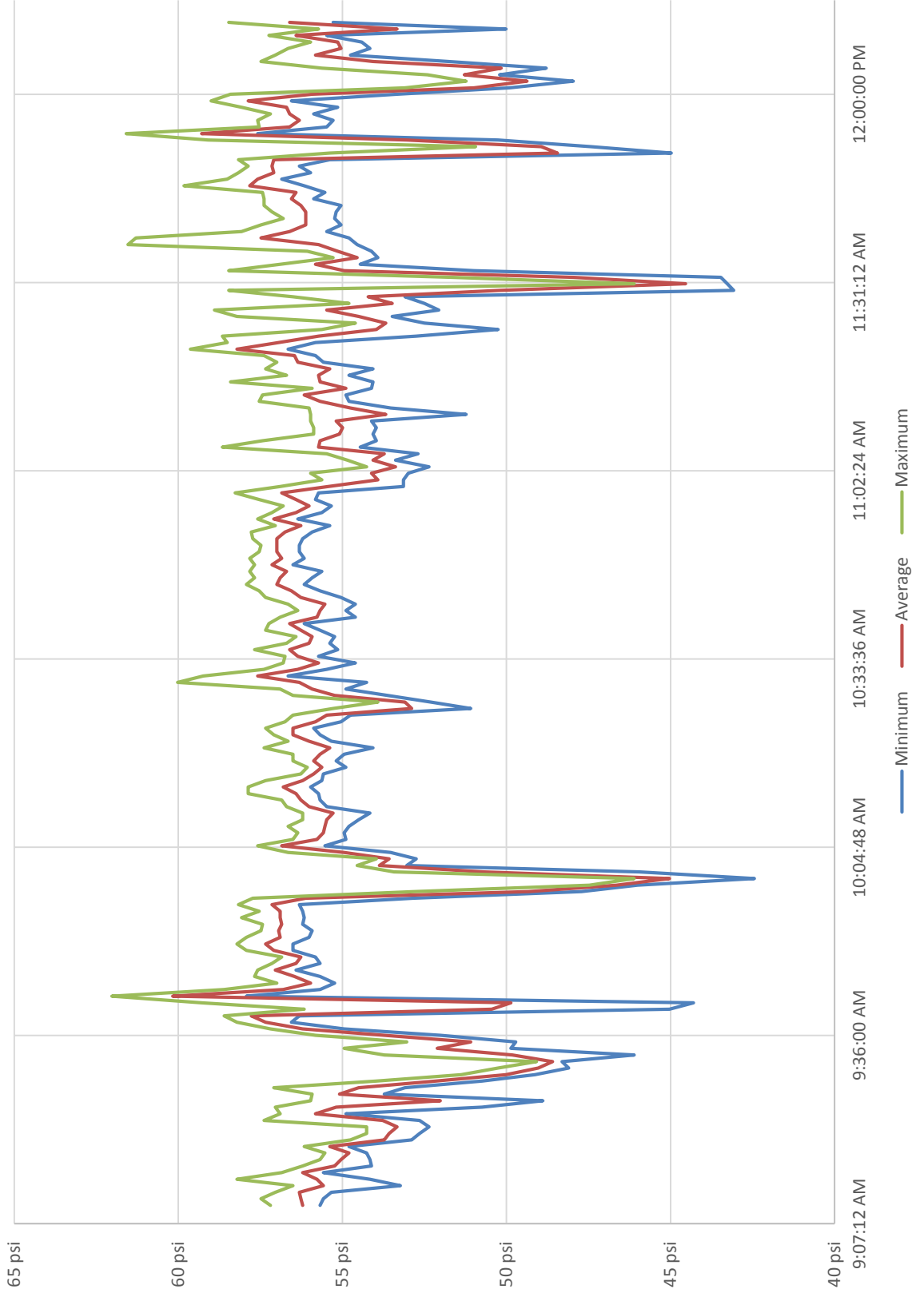
Appendix I

Pressure Logger Data

Logger L1 - Hydrant #283 - Southwest of Intersection 50th Avenue & 52nd Street



Logger L2 - Hydrant #680 - 6700 56th Street



Appendix II Test Results

Fire Flow Test Report

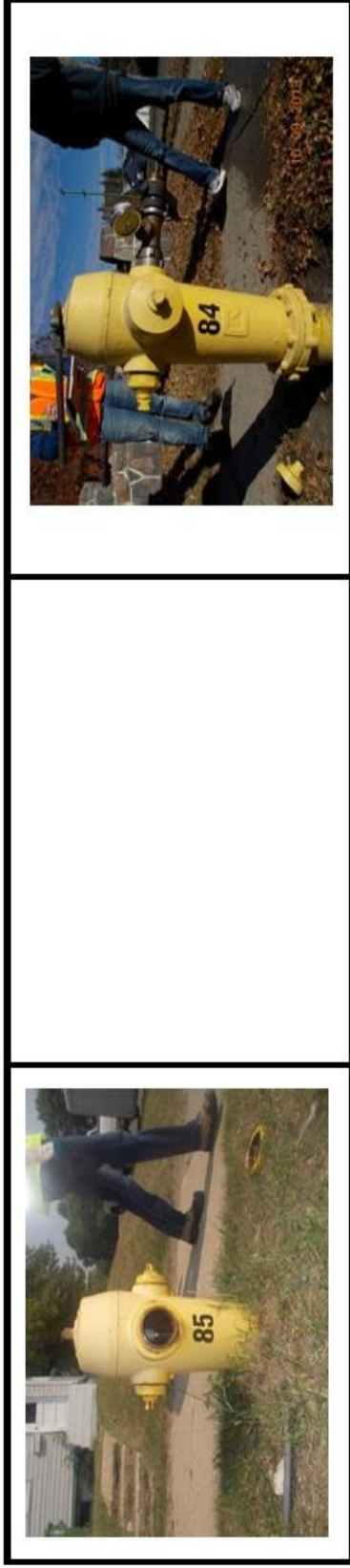
Client Name:	ISL Engineering	Hyd 1 - #/Port Size	1- 2.5"	Flow Hyd 1 Addr.	48 Street & 47 Ave (NW Corner)
Project Location:	Lloyminster, AB/SK	Hyd 2 - #/Port Size	2.5" HM	Flow Hyd 2 Addr.	48 Street & 48 Ave (NW Corner)
SFE Project #:	A15-130	Hyd 1 - Pito Types		Resid Hyd Addr.	Auto
SFE Technicians:	Inder Lakhian Jake Fushtey	Hyd 2 - Pito Types	NFPA 291	Fire Pump Status	Force On
		Test Procedure		(circle one)	

Test ID: A15-130-03 Test : 3 of 5 Date: 09-Jul-15

Start Time	Flow Hyd 1		Flow Hyd 2		Residual Hydrant	
	Port 1-1 psi	Port 1-2 psi	Port 2-1 psi	Port 2-2 psi	Static psi	Residual psi
11:00	9.5				74	42

Flow Summary (igpm)	
Flow 1-1	520.5
Flow 1-2	
Flow 2-1	
Flow 2-2	
Total Flow	520.5
Flow @ 20 psi	690

Notes: Test D
Anticipated low pressure from last year test - Used 2.5" HM instead of 4" HM



GPS N53.281700 W109.997665 Flow Hydrant #85 GPS N53.281636 W110.000452

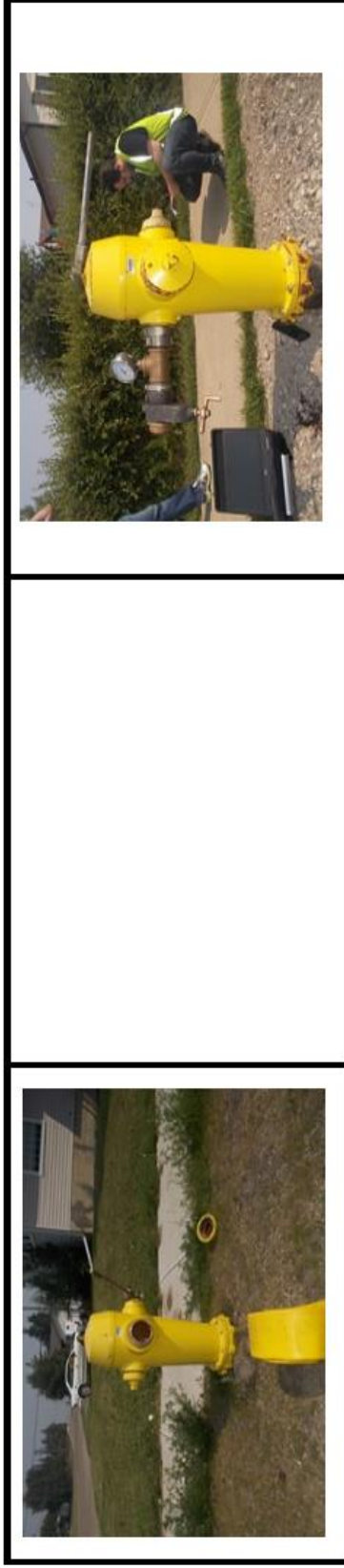
Fire Flow Test Report

Client Name:	ISL Engineering	Hyd 1 - #/Port Size	1 - 4"	Flow Hyd 1 Addr.	NE Corner - 56A St & 52nd Ave
Project Location:	Lloyminster, AB/SK	Hyd 2 - #/Port Size	4" HM	Flow Hyd 2 Addr.	
SFE Project #:	A15-130	Hyd 1 - Pito Types		Resid Hyd Addr.	NE Corner - 56A St & 53rd Ave
SFE Technicians:	Inder Lakhian Jake Fushtey	Hyd 2 - Pito Types		Fire Pump Status	Auto
		Test Procedure	NFPA 291	(circle one)	Force On

Test ID: A15-130-04 Test : 4 of 5 Date: 09-Jul-15

Start Time	Flow Hyd 1			Flow Hyd 2			Residual Hydrant		
	Port 1-1 psi	Port 1-2 psi	Port 2-2 psi	Static psi	Residual psi	Static psi	Residual psi	Static psi	
11:30	13			73	58			76	
Notes: Test A									

Flow Summary (igpm)	
Flow 1-1	1356
Flow 1-2	
Flow 2-1	
Flow 2-2	
Total Flow	1356
Flow @ 20 psi	2681



GPS N53.291262 W110.010336 Flow Hydrant 2 Residual Hydrant #226
 GPS N53.291146 W110.012344

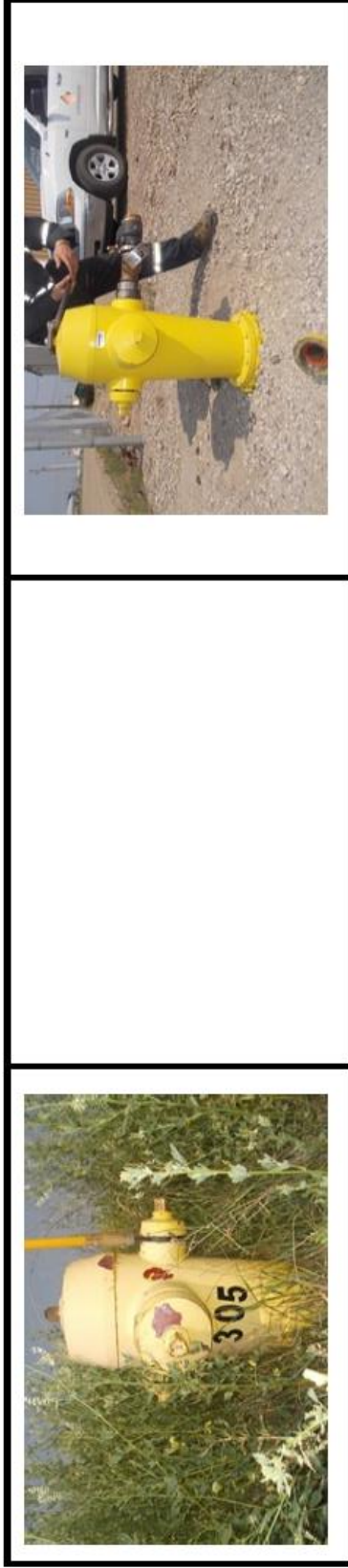
Fire Flow Test Report

Client Name:	ISL Engineering	Hyd 1 - #/Port Size	1 - 4"	Flow Hyd 1 Addr.	5212 63 Street
Project Location:	Lloyminster, AB/SK	Hyd 2 - #/Port Size	4" HM	Flow Hyd 2 Addr.	
SFE Project #:	A15-130	Hyd 1 - Pito Types		Resid Hyd Addr.	5110 63 Street
SFE Technicians:	Inder Lakhian Jake Fushtey	Hyd 2 - Pito Types		Fire Pump Status	Auto
		Test Procedure	NFPA 291	(circle one)	Force On

Test ID: A15-130-05 Test: 5 of 5 Date: 09-Jul-15

Start Time	Flow Hyd 1			Flow Hyd 2			Residual Hydrant		
	Port 1-1	Port 1-2	Port 2-2	Port 2-1	Port 2-2	Static	Residual	Static	Static
End Time	psi	psi	psi	psi	psi	psi	psi	psi	psi
11:51	16					83	74		86
Notes: Test B									

Flow Summary (igpm)	
Flow 1-1	1504
Flow 1-2	
Flow 2-1	
Flow 2-2	
Total Flow	1504
Flow @ 20 psi	4301

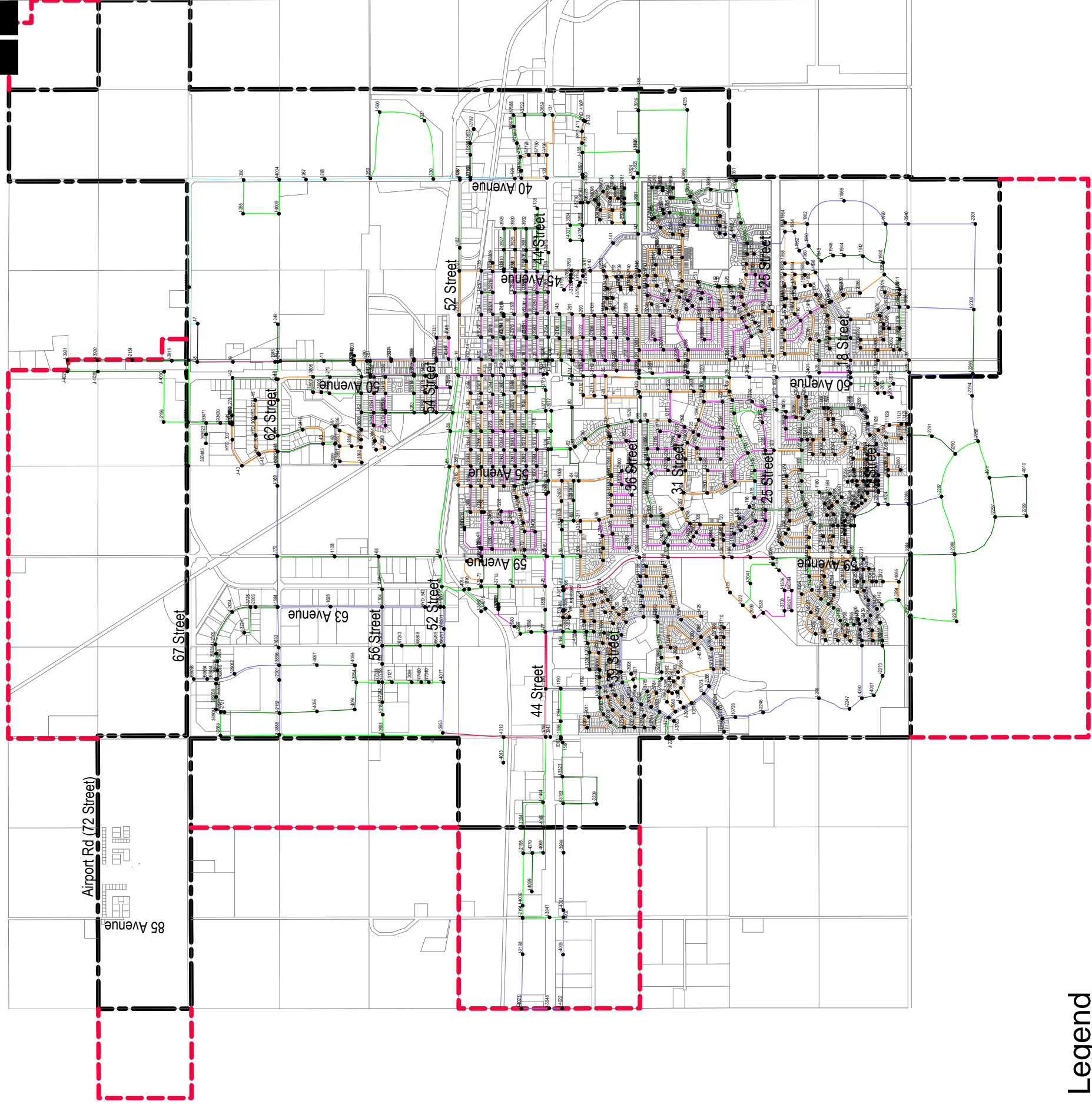


Flow Hydrant #305 Flow Hydrant 2 Residual Hydrant #279
 GPS N53.301578 W110.015950 GPS N53.301751 W110.011235



Appendix C
Existing System Model Fire Flow Results





Legend

- City Boundary
- Proposed Annexation Area
- PIPE SIZES**
- <= 150 mm
- <= 200 mm
- <= 250 mm
- <= 300 mm
- <= 350 mm
- <= 400 mm
- <= 450 mm
- <= 500 mm
- <= 600 mm
- <= 750 mm
- Other

NOTE: The proposed annexation area shown is from the City of Lloydminster's 2013 Growth Study. It may be subject to change upon completion of the 2016 Joint Growth Study that is currently in progress.

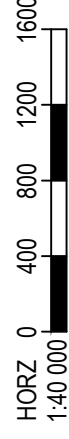


Table C1: Existing System Model Fire Flow Results - Only West Reservoir Pumphouse Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
1587	479: Zone-Main	FALSE	225	219	220	150	150	150	158	14696: J-3323	TRUE
1680	479: Zone-Main	TRUE	No Hydrant	56	56	150	150	150	311	15778: J-3643	TRUE
1833	479: Zone-Main	FALSE	225	178	178	150	184	150	150	6834: 377340	TRUE
2955	479: Zone-Main	TRUE	No Hydrant	240	240	150	150	150	161	6834: 377340	TRUE
3018	479: Zone-Main	FALSE	225	111	111	150	170	150	150	5951: 1680	TRUE
3021	479: Zone-Main	FALSE	225	104	104	150	166	150	150	5951: 1680	TRUE
3144	479: Zone-Main	FALSE	225	135	135	150	165	150	150	7023: 393523	TRUE
3691	479: Zone-Main	TRUE	No Hydrant	282	282	150	150	150	157	18530: J-3958	TRUE
6363	479: Zone-Main	TRUE	No Hydrant	223	223	150	150	150	151	5948: 1587	TRUE
106989	479: Zone-Main	TRUE	225	276	276	150	150	150	169	6118: 107003	TRUE
107003	479: Zone-Main	TRUE	225	283	283	150	157	150	150	6116: 106989	TRUE
107051	479: Zone-Main	TRUE	225	291	291	150	165	150	150	6116: 106989	TRUE
107073	479: Zone-Main	TRUE	225	300	300	150	173	150	157	18536: J-3962	TRUE
107118	479: Zone-Main	TRUE	225	300	300	150	174	150	155	18536: J-3962	TRUE
107136	479: Zone-Main	TRUE	100	300	300	150	177	150	164	6014: 3891	TRUE
110585	479: Zone-Main	FALSE	225	153	154	150	150	150	155	6136: 110603	TRUE
110603	479: Zone-Main	FALSE	225	147	148	150	150	150	154	13252: J-2787	TRUE
110726	479: Zone-Main	TRUE	100	280	281	150	150	150	155	6014: 3891	TRUE
110817	479: Zone-Main	TRUE	100	224	224	150	165	150	150	6834: 377340	TRUE
110821	479: Zone-Main	TRUE	No Hydrant	244	244	150	165	150	150	6834: 377340	TRUE
110827	479: Zone-Main	TRUE	100	168	169	150	158	150	150	6192: 116421	TRUE
111105	479: Zone-Main	TRUE	185	195	195	150	153	150	150	6161: 111115	TRUE
111115	479: Zone-Main	TRUE	100	164	164	150	150	150	187	6165: 111123	TRUE
111121	479: Zone-Main	TRUE	100	165	165	150	154	150	150	6165: 111123	TRUE
111123	479: Zone-Main	TRUE	No Hydrant	149	149	150	150	150	199	6834: 377340	TRUE
111129	479: Zone-Main	FALSE	185	171	171	150	150	150	169	6165: 111123	TRUE
111519	479: Zone-Main	TRUE	100	252	253	150	150	150	220	6014: 3891	TRUE
116132	479: Zone-Main	TRUE	No Hydrant	242	242	150	163	150	150	6834: 377340	TRUE
116323	479: Zone-Main	TRUE	100	230	230	150	151	150	150	6834: 377340	TRUE
116331	479: Zone-Main	TRUE	100	220	220	150	150	150	173	6834: 377340	TRUE
116355	479: Zone-Main	TRUE	100	195	195	150	160	150	150	6192: 116421	TRUE
116381	479: Zone-Main	TRUE	100	151	151	150	153	150	150	6199: 117256	TRUE
116421	479: Zone-Main	TRUE	100	151	151	150	150	150	192	6199: 117256	TRUE
116465	479: Zone-Main	TRUE	100	222	222	150	150	150	157	6834: 377340	TRUE
117256	479: Zone-Main	TRUE	100	138	138	150	150	150	187	6187: 116381	TRUE
121664	479: Zone-Main	TRUE	225	248	248	150	150	150	166	6371: 158061	TRUE
127105	479: Zone-Main	TRUE	100	184	185	150	150	150	250	6014: 3891	TRUE
134621	479: Zone-Main	TRUE	100	233	233	150	158	150	150	2393: J-2128	TRUE
149113	479: Zone-Main	TRUE	No Hydrant	238	238	150	150	150	155	6834: 377340	TRUE
149174	479: Zone-Main	TRUE	100	240	240	150	160	150	150	6834: 377340	TRUE
157379	479: Zone-Main	TRUE	100	214	214	150	150	150	162	6834: 377340	TRUE
158061	479: Zone-Main	FALSE	225	198	198	150	150	150	244	16591: J-3792	TRUE
158622	479: Zone-Main	TRUE	100	210	210	150	150	150	151	6834: 377340	TRUE
158655	479: Zone-Main	TRUE	100	192	192	150	150	150	224	6834: 377340	TRUE
158661	479: Zone-Main	TRUE	100	185	185	150	150	150	210	6380: 158622	TRUE
158948	479: Zone-Main	TRUE	100	225	225	150	152	150	150	6834: 377340	TRUE
158958	479: Zone-Main	TRUE	100	219	219	150	150	150	160	6834: 377340	TRUE
166366	479: Zone-Main	TRUE	100	241	241	150	150	150	192	6834: 377340	TRUE
166368	479: Zone-Main	TRUE	100	264	264	150	150	150	150	6834: 377340	TRUE
166379	479: Zone-Main	TRUE	100	229	229	150	150	150	174	2393: J-2128	TRUE
166395	479: Zone-Main	TRUE	100	258	258	150	150	150	153	6834: 377340	TRUE
166491	479: Zone-Main	TRUE	100	261	261	150	150	150	164	6834: 377340	TRUE
167243	479: Zone-Main	FALSE	225	184	185	150	168	150	150	6834: 377340	TRUE
186795	479: Zone-Main	TRUE	225	247	247	150	153	150	150	6371: 158061	TRUE
186797	479: Zone-Main	TRUE	No Hydrant	198	198	150	152	150	150	16591: J-3792	TRUE
187566	479: Zone-Main	FALSE	225	171	172	150	150	150	155	16393: J-3721	TRUE
187588	479: Zone-Main	FALSE	225	175	175	150	158	150	150	6651: 188078	TRUE
187660	479: Zone-Main	FALSE	225	173	173	150	151	150	150	13184: J-2762	TRUE
187778	479: Zone-Main	TRUE	No Hydrant	164	164	150	150	150	165	6834: 377340	TRUE
187780	479: Zone-Main	TRUE	No Hydrant	161	161	150	150	150	167	6834: 377340	TRUE
188078	479: Zone-Main	TRUE	No Hydrant	174	174	150	153	150	150	6834: 377340	TRUE
366501	479: Zone-Main	FALSE	225	188	188	150	186	150	150	6834: 377340	TRUE
366751	479: Zone-Main	FALSE	225	188	188	150	164	150	150	6834: 377340	TRUE
366769	479: Zone-Main	TRUE	No Hydrant	187	187	150	159	150	150	6834: 377340	TRUE
366848	479: Zone-Main	FALSE	225	186	187	150	154	150	150	6834: 377340	TRUE
369028	479: Zone-Main	FALSE	225	173	173	150	169	150	150	12899: J-2669	TRUE
369034	479: Zone-Main	TRUE	No Hydrant	173	173	150	182	150	150	18310: J-3888	TRUE
369038	479: Zone-Main	FALSE	225	174	174	150	201	150	150	18310: J-3888	TRUE
369042	479: Zone-Main	FALSE	225	175	175	150	226	150	150	18310: J-3888	TRUE
369044	479: Zone-Main	TRUE	No Hydrant	175	175	150	231	150	150	18310: J-3888	TRUE
369046	479: Zone-Main	FALSE	225	175	175	150	230	150	150	18310: J-3888	TRUE
369052	479: Zone-Main	FALSE	225	175	175	150	233	150	150	18310: J-3888	TRUE
369094	479: Zone-Main	FALSE	225	175	175	150	240	150	150	18310: J-3888	TRUE
369098	479: Zone-Main	FALSE	225	175	175	150	246	150	150	18310: J-3888	TRUE
369316	479: Zone-Main	FALSE	225	176	176	150	211	150	150	18310: J-3888	TRUE
369364	479: Zone-Main	FALSE	225	177	177	150	201	150	150	18310: J-3888	TRUE
369723	479: Zone-Main	TRUE	100	221	221	150	156	150	150	16598: J-3795	TRUE
369727	479: Zone-Main	TRUE	100	220	221	150	155	150	150	16598: J-3795	TRUE
370154	479: Zone-Main	TRUE	100	163	163	150	150	150	154	14065: J-3122	TRUE
370405	479: Zone-Main	TRUE	100	177	177	150	152	150	150	6731: 370154	TRUE
37282	479: Zone-Main	TRUE	No Hydrant	148	148	150	150	150	203	6834: 377340	TRUE
377338	479: Zone-Main	FALSE	225	175	175	150	163	150	150	6834: 377340	TRUE
377340	479: Zone-Main	FALSE	225	147	147	150	150	150	169	6841: 377460	TRUE
377460	479: Zone-Main	TRUE	No Hydrant	151	151	150	160	150	150	6834: 377340	TRUE
377669	479: Zone-Main	TRUE	No Hydrant	223	223	150	150	150	150	16598: J-3795	TRUE
377798	479: Zone-Main	TRUE	No Hydrant	175	175	150	168	150	150	6834: 377340	TRUE
379439	479: Zone-Main	TRUE	100	222	222	150	152	150	150	16598: J-3795	TRUE
379449	479: Zone-Main	TRUE	100	220	220	150	158	150	150	16598: J-3795	TRUE
380208	479: Zone-Main	TRUE	100	222	222	150	154	150	150	16598: J-3795	TRUE
381224	479: Zone-Main	TRUE	100	222	222	150	154	150	150	16598: J-3795	TRUE
390267	479: Zone-Main	FALSE	225	70	70	150	150	150	201	16288: J-3708	TRUE

Table C1: Existing System Model Fire Flow Results - Only West Reservoir Pumphouse Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
390344	479: Zone-Main	FALSE	225	71	71	150	150	150	193	7007: 390267	TRUE
393420	479: Zone-Main	TRUE	No Hydrant	131	131	150	153	150	150	6834: 377340	TRUE
393471	479: Zone-Main	FALSE	225	125	126	150	153	150	150	7023: 393523	TRUE
393483	479: Zone-Main	FALSE	225	118	119	150	150	150	167	7023: 393523	TRUE
393523	479: Zone-Main	TRUE	No Hydrant	121	121	150	150	150	150	6834: 377340	TRUE
398098	479: Zone-Main	FALSE	185	180	180	150	183	150	150	18345: J-3904	TRUE
398161	479: Zone-Main	TRUE	No Hydrant	194	194	150	186	150	150	6834: 377340	TRUE
398225	479: Zone-Main	TRUE	185	188	189	150	183	150	150	18345: J-3904	TRUE
398555	479: Zone-Main	FALSE	185	173	174	150	158	150	150	12363: J-2419	TRUE
398639	479: Zone-Main	FALSE	185	176	176	150	165	150	150	18345: J-3904	TRUE
398721	479: Zone-Main	TRUE	100	175	175	150	176	150	150	6834: 377340	TRUE
398794	479: Zone-Main	TRUE	100	173	173	150	150	150	157	6834: 377340	TRUE
399184	479: Zone-Main	TRUE	100	174	174	150	163	150	150	6834: 377340	TRUE
399697	479: Zone-Main	TRUE	100	172	172	150	150	150	152	6834: 377340	TRUE
399781	479: Zone-Main	TRUE	100	173	173	150	162	150	150	6834: 377340	TRUE
399812	479: Zone-Main	FALSE	185	171	172	150	169	150	150	18345: J-3904	TRUE
399839	479: Zone-Main	TRUE	No Hydrant	170	170	150	171	150	150	6834: 377340	TRUE
HYD_113	479: Zone-Main	TRUE	No Hydrant	95	95	150	150	150	155	3244: J-2382	TRUE
HYD_114	479: Zone-Main	TRUE	No Hydrant	88	88	150	150	150	162	2997: J-2324	TRUE
HYD_208	479: Zone-Main	TRUE	100	208	208	150	150	150	173	6834: 377340	TRUE
HYD_226	479: Zone-Main	TRUE	No Hydrant	129	129	150	150	150	275	6834: 377340	TRUE
HYD_282	479: Zone-Main	TRUE	100	199	199	150	150	150	237	6834: 377340	TRUE
HYD_275	479: Zone-Main	FALSE	225	148	148	150	150	150	161	7023: 393523	TRUE
HYD_279	479: Zone-Main	TRUE	No Hydrant	169	169	150	150	150	215	6834: 377340	TRUE
HYD_303	479: Zone-Main	TRUE	No Hydrant	144	144	150	150	150	204	6834: 377340	TRUE
HYD_304	479: Zone-Main	TRUE	No Hydrant	143	143	150	155	150	150	6834: 377340	TRUE
HYD_305	479: Zone-Main	TRUE	No Hydrant	195	195	150	150	150	163	6834: 377340	TRUE
HYD_306	479: Zone-Main	TRUE	No Hydrant	171	171	150	150	150	210	6834: 377340	TRUE
HYD_35	479: Zone-Main	FALSE	225	115	115	150	150	150	156	16646: J-3815	TRUE
HYD_410P	479: Zone-Main	TRUE	No Hydrant	178	178	150	151	150	150	6834: 377340	TRUE
HYD_411	479: Zone-Main	TRUE	No Hydrant	193	193	150	150	150	180	6834: 377340	TRUE
HYD_434	479: Zone-Main	TRUE	100	183	183	150	150	150	274	6834: 377340	TRUE
HYD_435	479: Zone-Main	TRUE	No Hydrant	300	300	150	180	150	163	6834: 377340	TRUE
HYD_44	479: Zone-Main	TRUE	No Hydrant	224	224	150	268	150	150	6834: 377340	TRUE
HYD_45	479: Zone-Main	TRUE	No Hydrant	160	160	150	150	150	226	6834: 377340	TRUE
HYD_495	479: Zone-Main	TRUE	No Hydrant	188	188	150	219	150	150	6834: 377340	TRUE
HYD_542	479: Zone-Main	TRUE	No Hydrant	187	187	150	222	150	150	6834: 377340	TRUE
HYD_602	479: Zone-Main	TRUE	No Hydrant	273	273	150	160	150	150	6834: 377340	TRUE
HYD_625	479: Zone-Main	TRUE	No Hydrant	242	242	150	150	150	178	6834: 377340	TRUE
HYD_627	479: Zone-Main	TRUE	No Hydrant	217	217	150	150	150	155	6834: 377340	TRUE
HYD_727	479: Zone-Main	TRUE	No Hydrant	153	153	150	158	150	150	6834: 377340	TRUE
HYD_728	479: Zone-Main	FALSE	185	180	180	150	158	150	150	1057: J-1878	TRUE
HYD_766	479: Zone-Main	TRUE	No Hydrant	187	187	150	317	150	150	18310: J-3888	TRUE
HYD_808	479: Zone-Main	TRUE	No Hydrant	267	267	150	150	150	152	6834: 377340	TRUE
HYD_830	479: Zone-Main	TRUE	No Hydrant	185	185	150	150	150	150	6834: 377340	TRUE
HYD_84	479: Zone-Main	TRUE	No Hydrant	58	58	150	151	150	150	3220: J-2374	TRUE
HYD_85	479: Zone-Main	TRUE	No Hydrant	44	44	150	150	150	151	2351: J-2113	TRUE
HYD_9	479: Zone-Main	TRUE	No Hydrant	190	190	150	150	150	204	6834: 377340	TRUE
J-10	479: Zone-Main	FALSE	225	220	220	150	331	150	150	18310: J-3888	TRUE
J-100	479: Zone-Main	TRUE	225	255	255	150	150	150	182	6834: 377340	TRUE
J-101	479: Zone-Main	TRUE	225	260	260	150	150	150	173	856: J-1440	TRUE
J-102	479: Zone-Main	TRUE	100	279	279	150	150	150	161	6834: 377340	TRUE
J-103	479: Zone-Main	TRUE	No Hydrant	300	300	150	209	150	186	6834: 377340	TRUE
J-104	479: Zone-Main	FALSE	225	216	216	150	150	150	178	3307: J-2403	TRUE
J-105	479: Zone-Main	FALSE	225	214	214	150	150	150	168	758: J-1216	TRUE
J-106	479: Zone-Main	FALSE	225	211	212	150	150	150	209	799: J-1300	TRUE
J-107	479: Zone-Main	TRUE	185	226	226	150	150	150	222	793: J-1288	TRUE
J-108	479: Zone-Main	FALSE	225	205	206	150	150	150	177	3262: J-2388	TRUE
J-109	479: Zone-Main	TRUE	225	251	252	150	150	150	196	6834: 377340	TRUE
J-11	479: Zone-Main	TRUE	No Hydrant	220	220	150	291	150	150	6834: 377340	TRUE
J-110	479: Zone-Main	TRUE	100	272	272	150	150	150	164	6834: 377340	TRUE
J-1100	479: Zone-Main	FALSE	225	188	189	150	218	150	150	6834: 377340	TRUE
J-1102	479: Zone-Main	FALSE	225	188	188	150	219	150	150	6834: 377340	TRUE
J-1104	479: Zone-Main	FALSE	225	185	185	150	232	150	150	6834: 377340	TRUE
J-1106	479: Zone-Main	FALSE	225	185	186	150	165	150	150	6834: 377340	TRUE
J-1108	479: Zone-Main	FALSE	225	99	101	150	150	150	210	672: J-65	TRUE
J-111	479: Zone-Main	TRUE	100	282	283	150	151	150	150	6834: 377340	TRUE
J-1110	479: Zone-Main	TRUE	100	300	300	150	193	150	177	6014: 3891	TRUE
J-1112	479: Zone-Main	TRUE	No Hydrant	300	300	150	204	150	175	6834: 377340	TRUE
J-1114	479: Zone-Main	TRUE	100	268	268	150	150	150	150	6014: 3891	TRUE
J-1116	479: Zone-Main	TRUE	100	239	239	150	150	150	167	6014: 3891	TRUE
J-1118	479: Zone-Main	TRUE	100	228	228	150	150	150	200	6014: 3891	TRUE
J-112	479: Zone-Main	TRUE	100	285	285	150	150	150	159	6834: 377340	TRUE
J-1120	479: Zone-Main	TRUE	100	230	230	150	150	150	159	6014: 3891	TRUE
J-1122	479: Zone-Main	TRUE	100	201	201	150	150	150	218	6014: 3891	TRUE
J-1124	479: Zone-Main	TRUE	100	209	209	150	150	150	192	716: J-1122	TRUE
J-1126	479: Zone-Main	TRUE	100	236	237	150	150	150	156	6014: 3891	TRUE
J-1128	479: Zone-Main	TRUE	100	237	237	150	155	150	150	6014: 3891	TRUE
J-113	479: Zone-Main	TRUE	225	287	288	150	150	150	161	6834: 377340	TRUE
J-1130	479: Zone-Main	TRUE	100	270	270	150	153	150	159	6014: 3891	TRUE
J-1132	479: Zone-Main	TRUE	100	300	300	150	213	150	175	6014: 3891	TRUE
J-1134	479: Zone-Main	TRUE	100	236	237	150	150	150	220	6014: 3891	TRUE
J-1136	479: Zone-Main	TRUE	100	182	182	150	150	150	267	6014: 3891	TRUE
J-1138	479: Zone-Main	TRUE	100	196	196	150	150	150	283	6014: 3891	TRUE
J-114	479: Zone-Main	TRUE	225	300	300	150	160	150	155	6834: 377340	TRUE
J-1140	479: Zone-Main	TRUE	No Hydrant	300	300	150	218	150	175	6834: 377340	TRUE
J-1142	479: Zone-Main	TRUE	No Hydrant	300	300	150	219	150	178	6834: 377340	TRUE
J-1146	479: Zone-Main	TRUE	225	228	228	150	150	150	265	6014: 3891	TRUE
J-1148	479: Zone-Main	TRUE	100	272	272	150	150	150	190	6834: 377340	TRUE
J-115	479: Zone-Main	TRUE	225	300	300	150	175	150	159	6834: 377340	TRUE
J-1150	479: Zone-Main	TRUE	100	300	300	150	233	150	184	6834: 377340	TRUE

Table C1: Existing System Model Fire Flow Results - Only West Reservoir Pumphouse Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-1152	479: Zone-Main	TRUE	100	263	263	150	150	150	163	6834: 377340	TRUE
J-1154	479: Zone-Main	TRUE	100	293	293	150	153	150	150	6834: 377340	TRUE
J-1156	479: Zone-Main	TRUE	100	230	231	150	150	150	230	6834: 377340	TRUE
J-1158	479: Zone-Main	TRUE	100	241	241	150	150	150	192	6834: 377340	TRUE
J-116	479: Zone-Main	TRUE	225	300	300	150	179	150	161	6834: 377340	TRUE
J-1160	479: Zone-Main	TRUE	No Hydrant	300	300	150	225	150	181	6834: 377340	TRUE
J-1162	479: Zone-Main	TRUE	100	169	169	150	150	150	327	6834: 377340	TRUE
J-1164	479: Zone-Main	TRUE	No Hydrant	283	283	150	150	150	161	6834: 377340	TRUE
J-1168	479: Zone-Main	TRUE	100	276	276	150	150	150	160	6834: 377340	TRUE
J-117	479: Zone-Main	TRUE	No Hydrant	271	271	150	157	150	150	6834: 377340	TRUE
J-1170	479: Zone-Main	TRUE	100	212	212	150	150	150	198	6834: 377340	TRUE
J-1172	479: Zone-Main	TRUE	100	261	261	150	150	150	173	6834: 377340	TRUE
J-1174	479: Zone-Main	TRUE	100	216	217	150	150	150	184	6834: 377340	TRUE
J-1176	479: Zone-Main	TRUE	225	270	271	150	150	150	159	743: J-1180	TRUE
J-1178	479: Zone-Main	TRUE	100	263	263	150	150	150	166	6834: 377340	TRUE
J-118	479: Zone-Main	TRUE	100	300	300	150	177	150	162	6834: 377340	TRUE
J-1180	479: Zone-Main	TRUE	225	248	249	150	150	150	171	6228: 121664	TRUE
J-1182	479: Zone-Main	TRUE	100	116	116	150	160	150	150	2405: J-2133	TRUE
J-1184	479: Zone-Main	TRUE	100	107	107	150	154	150	150	16442: J-3730	TRUE
J-119	479: Zone-Main	TRUE	100	300	300	150	181	150	163	6834: 377340	TRUE
J-1190	479: Zone-Main	TRUE	225	300	302	150	190	150	177	6014: 3891	TRUE
J-1192	479: Zone-Main	TRUE	185	300	300	150	191	150	176	6014: 3891	TRUE
J-1194	479: Zone-Main	TRUE	225	246	248	150	159	150	150	6090: 6363	TRUE
J-1196	479: Zone-Main	TRUE	No Hydrant	300	300	150	190	150	178	6834: 377340	TRUE
J-1198	479: Zone-Main	TRUE	No Hydrant	300	300	150	240	150	187	6834: 377340	TRUE
J-12	479: Zone-Main	TRUE	No Hydrant	220	220	150	290	150	150	6834: 377340	TRUE
J-120	479: Zone-Main	TRUE	No Hydrant	253	253	150	150	150	209	6834: 377340	TRUE
J-1200	479: Zone-Main	TRUE	No Hydrant	300	300	150	246	150	195	6834: 377340	TRUE
J-1202	479: Zone-Main	TRUE	100	295	295	150	150	150	162	6834: 377340	TRUE
J-1204	479: Zone-Main	TRUE	100	258	258	150	150	150	156	6834: 377340	TRUE
J-1206	479: Zone-Main	TRUE	225	260	261	150	150	150	174	6192: 116421	TRUE
J-121	479: Zone-Main	TRUE	100	243	243	150	150	150	227	6834: 377340	TRUE
J-1210	479: Zone-Main	TRUE	100	205	206	150	150	150	218	6834: 377340	TRUE
J-1212	479: Zone-Main	TRUE	100	206	206	150	150	150	184	6834: 377340	TRUE
J-1214	479: Zone-Main	FALSE	225	199	200	150	150	150	195	3271: J-2391	TRUE
J-1216	479: Zone-Main	TRUE	No Hydrant	138	138	150	150	150	312	6834: 377340	TRUE
J-1218	479: Zone-Main	FALSE	225	141	142	150	150	150	303	803: J-1308	TRUE
J-122	479: Zone-Main	TRUE	No Hydrant	300	300	150	177	150	163	6834: 377340	TRUE
J-1220	479: Zone-Main	FALSE	225	192	193	150	150	150	254	3307: J-2403	TRUE
J-1222	479: Zone-Main	FALSE	225	168	169	150	150	150	171	18266: J-3881	TRUE
J-1224	479: Zone-Main	FALSE	185	155	155	150	159	150	150	16458: J-3737	TRUE
J-1226	479: Zone-Main	FALSE	225	216	216	150	150	150	159	2407: J-2134	TRUE
J-1228	479: Zone-Main	FALSE	225	178	178	150	150	150	216	790: J-1282	TRUE
J-123	479: Zone-Main	TRUE	No Hydrant	256	256	150	150	150	158	6834: 377340	TRUE
J-1230	479: Zone-Main	TRUE	185	224	225	150	150	150	176	6834: 377340	TRUE
J-1232	479: Zone-Main	TRUE	100	228	228	150	150	150	161	6834: 377340	TRUE
J-1234	479: Zone-Main	TRUE	100	237	237	150	156	150	150	6834: 377340	TRUE
J-1236	479: Zone-Main	TRUE	No Hydrant	201	201	150	150	150	202	6834: 377340	TRUE
J-1238	479: Zone-Main	TRUE	No Hydrant	192	192	150	151	150	150	6834: 377340	TRUE
J-124	479: Zone-Main	TRUE	No Hydrant	300	300	150	171	150	168	6834: 377340	TRUE
J-1240	479: Zone-Main	FALSE	225	167	168	150	157	150	150	3211: J-2371	TRUE
J-1242	479: Zone-Main	TRUE	No Hydrant	174	174	150	159	150	150	6834: 377340	TRUE
J-1244	479: Zone-Main	FALSE	225	183	184	150	150	150	197	769: J-1238	TRUE
J-1246	479: Zone-Main	FALSE	225	152	152	150	150	150	200	3217: J-2373	TRUE
J-1248	479: Zone-Main	TRUE	185	233	233	150	230	150	150	6834: 377340	TRUE
J-125	479: Zone-Main	TRUE	No Hydrant	173	173	150	150	150	294	6834: 377340	TRUE
J-1250	479: Zone-Main	TRUE	185	233	233	150	225	150	150	6834: 377340	TRUE
J-1252	479: Zone-Main	FALSE	225	203	204	150	150	150	181	18310: J-3888	TRUE
J-1254	479: Zone-Main	TRUE	185	221	221	150	183	150	150	6834: 377340	TRUE
J-1256	479: Zone-Main	FALSE	225	160	160	150	150	150	253	3337: J-2413	TRUE
J-1258	479: Zone-Main	TRUE	185	221	222	150	183	150	150	6834: 377340	TRUE
J-1260	479: Zone-Main	FALSE	225	222	222	150	197	150	150	6834: 377340	TRUE
J-1262	479: Zone-Main	TRUE	No Hydrant	224	224	150	256	150	150	6834: 377340	TRUE
J-1264	479: Zone-Main	TRUE	225	226	226	150	271	150	150	6834: 377340	TRUE
J-1266	479: Zone-Main	TRUE	225	227	227	150	150	150	155	6834: 377340	TRUE
J-1268	479: Zone-Main	FALSE	225	178	179	150	150	150	188	18041: HYD_35	TRUE
J-127	479: Zone-Main	TRUE	225	228	229	150	150	150	154	6834: 377340	TRUE
J-1270	479: Zone-Main	TRUE	185	241	241	150	205	150	150	6834: 377340	TRUE
J-1272	479: Zone-Main	TRUE	100	130	130	150	150	150	269	6834: 377340	TRUE
J-1276	479: Zone-Main	FALSE	185	180	181	150	150	150	246	6834: 377340	TRUE
J-1278	479: Zone-Main	TRUE	225	238	238	150	215	150	150	6834: 377340	TRUE
J-128	479: Zone-Main	FALSE	225	169	169	150	150	150	151	16382: J-3719	TRUE
J-1280	479: Zone-Main	TRUE	100	140	140	150	150	150	263	6834: 377340	TRUE
J-1282	479: Zone-Main	TRUE	100	131	133	150	150	150	192	3319: J-2407	TRUE
J-1284	479: Zone-Main	TRUE	100	140	140	150	150	150	254	6834: 377340	TRUE
J-1286	479: Zone-Main	TRUE	100	257	257	150	150	150	175	6834: 377340	TRUE
J-1288	479: Zone-Main	FALSE	225	208	208	150	150	150	212	599: J-108	TRUE
J-129	479: Zone-Main	FALSE	225	169	169	150	150	150	157	16382: J-3719	TRUE
J-1290	479: Zone-Main	TRUE	185	195	196	150	150	150	180	800: J-1302	TRUE
J-1292	479: Zone-Main	TRUE	100	162	162	150	150	150	280	6834: 377340	TRUE
J-1294	479: Zone-Main	TRUE	100	148	148	150	150	150	265	6834: 377340	TRUE
J-1296	479: Zone-Main	FALSE	225	196	197	150	150	150	237	796: J-1294	TRUE
J-1298	479: Zone-Main	TRUE	100	159	160	150	150	150	215	3295: J-2399	TRUE
J-13	479: Zone-Main	TRUE	No Hydrant	220	220	150	260	150	150	6834: 377340	TRUE
J-130	479: Zone-Main	TRUE	No Hydrant	144	144	150	150	150	253	6834: 377340	TRUE
J-1300	479: Zone-Main	FALSE	185	169	170	150	150	150	191	3274: J-2392	TRUE
J-1302	479: Zone-Main	FALSE	185	176	176	150	150	150	188	3274: J-2392	TRUE
J-1304	479: Zone-Main	TRUE	100	202	202	150	150	150	189	6834: 377340	TRUE
J-1306	479: Zone-Main	TRUE	100	247	247	150	150	150	158	6834: 377340	TRUE
J-1308	479: Zone-Main	TRUE	100	160	160	150	150	150	211	2362: J-2117	TRUE
J-131	479: Zone-Main	FALSE	225	176	176	150	150	150	155	15905: J-3659	TRUE

Table C1: Existing System Model Fire Flow Results - Only West Reservoir Pumphouse Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-1310	479: Zone-Main	TRUE	No Hydrant	210	210	150	202	150	150	6834: 377340	TRUE
J-1312	479: Zone-Main	TRUE	225	300	300	150	171	150	161	2393: J-2128	TRUE
J-132	479: Zone-Main	FALSE	225	178	179	150	150	150	154	8020: HYD_410F	TRUE
J-133	479: Zone-Main	TRUE	225	230	230	150	153	150	150	6834: 377340	TRUE
J-1338	479: Zone-Main	TRUE	100	270	270	150	150	150	162	6834: 377340	TRUE
J-134	479: Zone-Main	TRUE	No Hydrant	232	232	150	173	150	150	6834: 377340	TRUE
J-1340	479: Zone-Main	TRUE	100	248	249	150	150	150	190	6834: 377340	TRUE
J-1342	479: Zone-Main	TRUE	100	254	254	150	150	150	178	2393: J-2128	TRUE
J-1344	479: Zone-Main	TRUE	100	257	257	150	173	150	150	2393: J-2128	TRUE
J-1348	479: Zone-Main	TRUE	100	238	238	150	174	150	150	2393: J-2128	TRUE
J-135	479: Zone-Main	TRUE	No Hydrant	233	233	150	229	150	150	6834: 377340	TRUE
J-1350	479: Zone-Main	TRUE	100	236	236	150	162	150	150	2393: J-2128	TRUE
J-1352	479: Zone-Main	TRUE	100	234	234	150	165	150	150	2393: J-2128	TRUE
J-1354	479: Zone-Main	TRUE	100	186	187	150	150	150	151	2393: J-2128	TRUE
J-1356	479: Zone-Main	TRUE	100	198	199	150	150	150	187	2393: J-2128	TRUE
J-1358	479: Zone-Main	TRUE	100	243	244	150	150	150	170	6834: 377340	TRUE
J-136	479: Zone-Main	TRUE	185	233	233	150	226	150	150	6834: 377340	TRUE
J-1360	479: Zone-Main	TRUE	100	260	260	150	150	150	171	6834: 377340	TRUE
J-1366	479: Zone-Main	TRUE	100	300	300	150	178	150	170	6014: 3891	TRUE
J-1368	479: Zone-Main	TRUE	100	300	300	150	175	150	167	6014: 3891	TRUE
J-137	479: Zone-Main	TRUE	185	233	233	150	210	150	150	6834: 377340	TRUE
J-1372	479: Zone-Main	TRUE	225	300	300	150	208	150	169	6014: 3891	TRUE
J-1374	479: Zone-Main	TRUE	No Hydrant	300	300	150	187	150	169	6014: 3891	TRUE
J-1376	479: Zone-Main	TRUE	225	291	291	150	150	150	152	6014: 3891	TRUE
J-1378	479: Zone-Main	TRUE	100	249	250	150	150	150	204	6014: 3891	TRUE
J-138	479: Zone-Main	FALSE	225	114	115	150	150	150	295	18461: J-3933	TRUE
J-1380	479: Zone-Main	TRUE	100	256	256	150	150	150	183	6014: 3891	TRUE
J-1382	479: Zone-Main	TRUE	No Hydrant	300	300	150	191	150	178	6834: 377340	TRUE
J-1384	479: Zone-Main	TRUE	185	300	300	150	162	150	167	6014: 3891	TRUE
J-1386	479: Zone-Main	TRUE	100	287	287	150	150	150	156	6014: 3891	TRUE
J-1388	479: Zone-Main	TRUE	100	300	300	150	196	150	176	6014: 3891	TRUE
J-139	479: Zone-Main	TRUE	No Hydrant	233	233	150	207	150	150	6834: 377340	TRUE
J-1390	479: Zone-Main	TRUE	185	280	280	150	150	150	181	6014: 3891	TRUE
J-1392	479: Zone-Main	TRUE	225	300	301	150	195	150	173	6014: 3891	TRUE
J-1394	479: Zone-Main	FALSE	225	128	128	150	150	150	241	858: J-1444	TRUE
J-1396	479: Zone-Main	TRUE	100	251	251	150	150	150	152	6834: 377340	TRUE
J-1398	479: Zone-Main	TRUE	185	262	262	150	194	150	150	6192: 116421	TRUE
J-14	479: Zone-Main	FALSE	225	224	224	150	279	150	150	6834: 377340	TRUE
J-140	479: Zone-Main	TRUE	No Hydrant	239	239	150	198	150	150	6834: 377340	TRUE
J-1400	479: Zone-Main	TRUE	225	266	268	150	187	150	150	6192: 116421	TRUE
J-1402	479: Zone-Main	TRUE	No Hydrant	273	273	150	169	150	150	6834: 377340	TRUE
J-1404	479: Zone-Main	TRUE	100	218	218	150	150	150	183	6834: 377340	TRUE
J-1406	479: Zone-Main	TRUE	100	234	234	150	150	150	167	6834: 377340	TRUE
J-1408	479: Zone-Main	TRUE	100	187	188	150	150	150	150	6834: 377340	TRUE
J-141	479: Zone-Main	TRUE	225	238	239	150	214	150	150	6834: 377340	TRUE
J-1410	479: Zone-Main	TRUE	185	226	226	150	150	150	175	6834: 377340	TRUE
J-1412	479: Zone-Main	TRUE	100	216	216	150	150	150	197	6834: 377340	TRUE
J-1414	479: Zone-Main	TRUE	100	238	238	150	203	150	150	6834: 377340	TRUE
J-1416	479: Zone-Main	TRUE	100	187	187	150	150	150	247	6834: 377340	TRUE
J-1418	479: Zone-Main	TRUE	No Hydrant	203	203	150	150	150	252	6834: 377340	TRUE
J-142	479: Zone-Main	TRUE	No Hydrant	238	238	150	215	150	150	6834: 377340	TRUE
J-1420	479: Zone-Main	TRUE	100	187	188	150	150	150	206	6834: 377340	TRUE
J-1422	479: Zone-Main	TRUE	185	253	254	150	154	150	150	2199: J-2052	TRUE
J-1424	479: Zone-Main	TRUE	225	300	300	150	194	150	164	6014: 3891	TRUE
J-1426	479: Zone-Main	TRUE	100	159	160	150	150	150	329	6014: 3891	TRUE
J-1428	479: Zone-Main	TRUE	100	266	266	150	177	150	150	2393: J-2128	TRUE
J-143	479: Zone-Main	TRUE	No Hydrant	204	204	150	150	150	214	6834: 377340	TRUE
J-1430	479: Zone-Main	TRUE	100	216	216	150	150	150	158	6834: 377340	TRUE
J-1432	479: Zone-Main	TRUE	100	300	300	150	173	150	164	6834: 377340	TRUE
J-1434	479: Zone-Main	TRUE	100	118	119	150	150	150	155	3262: J-2388	TRUE
J-1436	479: Zone-Main	TRUE	100	108	108	150	150	150	170	3262: J-2388	TRUE
J-1438	479: Zone-Main	TRUE	No Hydrant	268	268	150	150	150	175	6834: 377340	TRUE
J-144	479: Zone-Main	TRUE	100	235	236	150	150	150	171	6834: 377340	TRUE
J-1440	479: Zone-Main	TRUE	100	252	252	150	150	150	185	6834: 377340	TRUE
J-1442	479: Zone-Main	TRUE	100	175	176	150	150	150	192	605: J-161	TRUE
J-1444	479: Zone-Main	FALSE	225	168	169	150	150	150	157	830: J-1394	TRUE
J-1446	479: Zone-Main	FALSE	225	211	211	150	150	150	162	3316: J-2406	TRUE
J-1448	479: Zone-Main	TRUE	185	215	215	150	150	150	176	6834: 377340	TRUE
J-145	479: Zone-Main	TRUE	No Hydrant	226	226	150	150	150	164	6834: 377340	TRUE
J-1450	479: Zone-Main	TRUE	185	237	237	150	150	150	150	6834: 377340	TRUE
J-1452	479: Zone-Main	TRUE	185	199	199	150	150	150	217	6834: 377340	TRUE
J-1454	479: Zone-Main	TRUE	100	206	206	150	150	150	183	6834: 377340	TRUE
J-1456	479: Zone-Main	TRUE	100	213	213	150	150	150	158	6834: 377340	TRUE
J-1458	479: Zone-Main	TRUE	No Hydrant	186	186	150	155	150	150	6834: 377340	TRUE
J-146	479: Zone-Main	TRUE	No Hydrant	208	208	150	150	150	207	6834: 377340	TRUE
J-1460	479: Zone-Main	TRUE	No Hydrant	223	223	150	218	150	150	6834: 377340	TRUE
J-1462	479: Zone-Main	FALSE	225	154	154	150	150	150	154	2356: J-2115	TRUE
J-1464	479: Zone-Main	TRUE	100	167	167	150	155	150	150	6834: 377340	TRUE
J-1466	479: Zone-Main	TRUE	100	120	121	150	150	150	162	870: J-1468	TRUE
J-1468	479: Zone-Main	TRUE	100	113	114	150	150	150	219	869: J-1466	TRUE
J-147	479: Zone-Main	TRUE	185	214	214	150	150	150	177	6834: 377340	TRUE
J-1470	479: Zone-Main	TRUE	100	162	162	150	150	150	187	6834: 377340	TRUE
J-1472	479: Zone-Main	TRUE	100	157	157	150	150	150	171	6834: 377340	TRUE
J-1474	479: Zone-Main	TRUE	No Hydrant	217	217	150	150	150	193	6834: 377340	TRUE
J-1476	479: Zone-Main	TRUE	100	123	123	150	154	150	150	16444: J-3731	TRUE
J-1478	479: Zone-Main	TRUE	No Hydrant	230	230	150	150	150	169	6834: 377340	TRUE
J-148	479: Zone-Main	FALSE	225	201	201	150	150	150	212	2281: J-2089	TRUE
J-1480	479: Zone-Main	TRUE	100	221	221	150	150	150	150	6834: 377340	TRUE
J-1482	479: Zone-Main	TRUE	100	241	241	150	150	150	157	6834: 377340	TRUE
J-1484	479: Zone-Main	TRUE	100	230	230	150	155	150	150	6834: 377340	TRUE
J-1486	479: Zone-Main	TRUE	100	232	232	150	155	150	150	6834: 377340	TRUE

Table C1: Existing System Model Fire Flow Results - Only West Reservoir Pumphouse Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-1488	479: Zone-Main	TRUE	No Hydrant	243	243	150	150	150	156	6834: 377340	TRUE
J-149	479: Zone-Main	TRUE	185	222	223	150	150	150	189	6834: 377340	TRUE
J-1490	479: Zone-Main	TRUE	100	217	217	150	150	150	150	6834: 377340	TRUE
J-1492	479: Zone-Main	TRUE	100	147	147	150	158	150	150	6834: 377340	TRUE
J-1494	479: Zone-Main	TRUE	100	116	116	150	165	150	150	16479: J-3747	TRUE
J-1496	479: Zone-Main	TRUE	100	124	124	150	152	150	150	16477: J-3746	TRUE
J-1498	479: Zone-Main	TRUE	100	202	202	150	150	150	175	6834: 377340	TRUE
J-15	479: Zone-Main	TRUE	No Hydrant	224	224	150	262	150	150	6834: 377340	TRUE
J-150	479: Zone-Main	TRUE	No Hydrant	220	220	150	150	150	194	6834: 377340	TRUE
J-1500	479: Zone-Main	TRUE	100	155	156	150	150	150	309	6834: 377340	TRUE
J-1502	479: Zone-Main	TRUE	No Hydrant	250	250	150	150	150	158	6834: 377340	TRUE
J-1504	479: Zone-Main	TRUE	No Hydrant	242	242	150	208	150	150	6834: 377340	TRUE
J-1506	479: Zone-Main	TRUE	225	251	252	150	154	150	150	6834: 377340	TRUE
J-1508	479: Zone-Main	TRUE	225	248	248	150	150	150	168	16643: J-3814	TRUE
J-151	479: Zone-Main	TRUE	100	200	200	150	150	150	208	6834: 377340	TRUE
J-1510	479: Zone-Main	TRUE	100	191	191	150	150	150	178	6834: 377340	TRUE
J-1512	479: Zone-Main	TRUE	100	191	191	150	150	150	167	6834: 377340	TRUE
J-1514	479: Zone-Main	TRUE	100	138	138	150	150	150	211	3298: J-2400	TRUE
J-1516	479: Zone-Main	TRUE	100	152	152	150	150	150	177	3298: J-2400	TRUE
J-1518	479: Zone-Main	TRUE	100	295	295	150	150	150	157	6834: 377340	TRUE
J-152	479: Zone-Main	FALSE	225	209	209	150	150	150	155	577: J-155	TRUE
J-1520	479: Zone-Main	TRUE	185	253	254	150	150	150	161	6834: 377340	TRUE
J-1522	479: Zone-Main	TRUE	100	159	160	150	150	150	290	6834: 377340	TRUE
J-1524	479: Zone-Main	TRUE	100	235	235	150	178	150	150	6834: 377340	TRUE
J-1526	479: Zone-Main	FALSE	225	196	196	150	150	150	203	6834: 377340	TRUE
J-1528	479: Zone-Main	FALSE	225	181	181	150	204	150	150	6834: 377340	TRUE
J-153	479: Zone-Main	TRUE	100	204	205	150	150	150	182	6834: 377340	TRUE
J-1530	479: Zone-Main	TRUE	No Hydrant	237	237	150	150	150	161	6834: 377340	TRUE
J-1532	479: Zone-Main	TRUE	225	297	297	150	160	150	150	499: J-322	TRUE
J-1534	479: Zone-Main	TRUE	225	283	285	150	150	150	159	16288: J-3708	TRUE
J-1536	479: Zone-Main	FALSE	225	82	82	150	150	150	153	7011: 390344	TRUE
J-1538	479: Zone-Main	TRUE	No Hydrant	89	89	150	150	150	254	16288: J-3708	TRUE
J-154	479: Zone-Main	TRUE	100	199	199	150	150	150	187	6834: 377340	TRUE
J-155	479: Zone-Main	TRUE	No Hydrant	210	210	150	150	150	151	6834: 377340	TRUE
J-156	479: Zone-Main	TRUE	100	206	206	150	150	150	180	6834: 377340	TRUE
J-157	479: Zone-Main	TRUE	100	191	191	150	154	150	150	6834: 377340	TRUE
J-158	479: Zone-Main	FALSE	225	148	148	150	154	150	150	2405: J-2133	TRUE
J-1584	479: Zone-Main	FALSE	225	181	183	150	283	150	150	18310: J-3888	TRUE
J-159	479: Zone-Main	TRUE	100	195	195	150	150	150	167	6834: 377340	TRUE
J-16	479: Zone-Main	TRUE	No Hydrant	224	224	150	255	150	150	6834: 377340	TRUE
J-160	479: Zone-Main	TRUE	No Hydrant	182	182	150	150	150	151	6834: 377340	TRUE
J-161	479: Zone-Main	TRUE	100	178	178	150	150	150	179	857: J-1442	TRUE
J-1628	479: Zone-Main	FALSE	225	185	187	150	232	150	150	18310: J-3888	TRUE
J-1632	479: Zone-Main	TRUE	No Hydrant	176	176	150	251	150	150	18310: J-3888	TRUE
J-1656	479: Zone-Main	TRUE	No Hydrant	225	225	150	153	150	150	6090: 6363	TRUE
J-168	479: Zone-Main	TRUE	225	252	253	150	150	150	237	6014: 3891	TRUE
J-169	479: Zone-Main	TRUE	No Hydrant	186	186	150	312	150	150	18310: J-3888	TRUE
J-17	479: Zone-Main	FALSE	225	225	225	150	194	150	150	6834: 377340	TRUE
J-170	479: Zone-Main	FALSE	225	183	185	150	275	150	150	18310: J-3888	TRUE
J-1750	479: Zone-Main	TRUE	No Hydrant	176	176	150	150	150	191	6834: 377340	TRUE
J-1798	479: Zone-Main	TRUE	No Hydrant	210	210	150	154	150	150	858: J-1444	TRUE
J-18	479: Zone-Main	FALSE	225	190	190	150	150	150	210	18029: HYD_113	TRUE
J-182	479: Zone-Main	FALSE	225	177	178	150	150	150	240	640: J-128	TRUE
J-184	479: Zone-Main	TRUE	No Hydrant	233	233	150	214	150	150	6834: 377340	TRUE
J-185	479: Zone-Main	TRUE	No Hydrant	166	166	150	150	150	231	6834: 377340	TRUE
J-186	479: Zone-Main	TRUE	No Hydrant	300	300	150	171	150	165	6834: 377340	TRUE
J-1866	479: Zone-Main	TRUE	100	178	178	150	160	150	150	6834: 377340	TRUE
J-1868	479: Zone-Main	TRUE	100	150	150	150	157	150	150	6834: 377340	TRUE
J-1878	479: Zone-Main	TRUE	100	135	135	150	150	150	208	1057: J-1878	TRUE
J-188	479: Zone-Main	TRUE	No Hydrant	228	228	150	162	150	150	1056: J-1868	TRUE
J-1880	479: Zone-Main	TRUE	No Hydrant	98	98	150	150	150	323	6834: 377340	TRUE
J-19	479: Zone-Main	TRUE	No Hydrant	183	183	150	150	150	153	663: J-76	TRUE
J-1900	479: Zone-Main	TRUE	100	268	268	150	168	150	150	6834: 377340	TRUE
J-1902	479: Zone-Main	TRUE	185	254	254	150	150	150	160	6834: 377340	TRUE
J-1904	479: Zone-Main	TRUE	185	208	209	150	150	150	167	6834: 377340	TRUE
J-1906	479: Zone-Main	TRUE	185	232	232	150	150	150	193	1057: J-1878	TRUE
J-1908	479: Zone-Main	TRUE	100	230	231	150	150	150	204	6834: 377340	TRUE
J-1910	479: Zone-Main	TRUE	100	261	261	150	154	150	150	6834: 377340	TRUE
J-1912	479: Zone-Main	TRUE	185	193	193	150	150	150	267	6834: 377340	TRUE
J-1914	479: Zone-Main	TRUE	185	268	269	150	181	150	150	6834: 377340	TRUE
J-1916	479: Zone-Main	TRUE	100	268	268	150	176	150	150	6834: 377340	TRUE
J-1918	479: Zone-Main	FALSE	225	220	220	150	331	150	150	6834: 377340	TRUE
J-1920	479: Zone-Main	FALSE	185	184	185	150	150	150	150	18310: J-3888	TRUE
J-1930	479: Zone-Main	TRUE	185	198	198	150	150	150	151	2274: J-2086	TRUE
J-1932	479: Zone-Main	TRUE	185	198	199	150	150	150	151	1103: J-1978	TRUE
J-194	479: Zone-Main	TRUE	No Hydrant	239	239	150	157	150	150	1103: J-1978	TRUE
J-196	479: Zone-Main	TRUE	100	187	187	150	150	150	186	6834: 377340	TRUE
J-1974	479: Zone-Main	TRUE	No Hydrant	188	188	150	150	150	165	6834: 377340	TRUE
J-1978	479: Zone-Main	TRUE	185	191	191	150	150	150	157	6834: 377340	TRUE
J-1980	479: Zone-Main	TRUE	185	187	187	150	150	150	155	1104: J-1980	TRUE
J-1982	479: Zone-Main	TRUE	No Hydrant	176	176	150	150	150	187	1106: J-1984	TRUE
J-1984	479: Zone-Main	FALSE	185	184	184	150	150	150	166	6834: 377340	TRUE
J-1988	479: Zone-Main	TRUE	No Hydrant	197	197	150	150	150	161	2262: J-2082	TRUE
J-1992	479: Zone-Main	TRUE	No Hydrant	170	170	150	150	150	178	6834: 377340	TRUE
J-1994	479: Zone-Main	TRUE	185	197	197	150	150	150	151	6834: 377340	TRUE
J-1996	479: Zone-Main	TRUE	No Hydrant	197	197	150	154	150	150	1103: J-1978	TRUE
J-1998	479: Zone-Main	FALSE	225	86	87	150	150	150	299	6834: 377340	TRUE
J-1999	479: Zone-Main	TRUE	No Hydrant	156	156	150	150	150	176	561: J-98	TRUE
J-20	479: Zone-Main	FALSE	225	178	178	150	150	150	189	18310: J-3888	TRUE
J-200	479: Zone-Main	TRUE	185	223	223	150	150	150	223	3247: J-2383	TRUE
J-2001	479: Zone-Main	TRUE	No Hydrant	173	173	150	209	150	150	6834: 377340	TRUE

Table C1: Existing System Model Fire Flow Results - Only West Reservoir Pumphouse Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-2002	479: Zone-Main	FALSE	225	187	187	150	317	150	150	18310: J-3888	TRUE
J-2003	479: Zone-Main	TRUE	No Hydrant	180	180	150	227	150	150	18310: J-3888	TRUE
J-2004	479: Zone-Main	FALSE	225	179	180	150	214	150	150	18310: J-3888	TRUE
J-2005	479: Zone-Main	FALSE	225	178	178	150	200	150	150	18310: J-3888	TRUE
J-2006	479: Zone-Main	TRUE	100	293	293	150	150	150	162	6014: 3891	TRUE
J-2008	479: Zone-Main	TRUE	No Hydrant	300	300	150	188	150	174	6834: 377340	TRUE
J-2009	479: Zone-Main	TRUE	185	300	300	150	154	150	161	6014: 3891	TRUE
J-2010	479: Zone-Main	TRUE	No Hydrant	267	267	150	150	150	155	6834: 377340	TRUE
J-2011	479: Zone-Main	TRUE	185	208	208	150	150	150	197	2103: J-2012	TRUE
J-2012	479: Zone-Main	TRUE	185	201	201	150	150	150	211	2101: J-2011	TRUE
J-2013	479: Zone-Main	TRUE	No Hydrant	267	267	150	150	150	161	6834: 377340	TRUE
J-2014	479: Zone-Main	TRUE	100	278	278	150	150	150	168	6014: 3891	TRUE
J-2015	479: Zone-Main	TRUE	100	280	280	150	150	150	164	6014: 3891	TRUE
J-2016	479: Zone-Main	TRUE	185	229	229	150	150	150	240	2114: J-2017	TRUE
J-2017	479: Zone-Main	TRUE	185	268	268	150	150	150	170	2112: J-2016	TRUE
J-2018	479: Zone-Main	TRUE	185	299	299	150	150	150	153	6014: 3891	TRUE
J-2019	479: Zone-Main	TRUE	185	248	248	150	150	150	208	2114: J-2017	TRUE
J-2020	479: Zone-Main	TRUE	100	271	271	150	150	150	173	6014: 3891	TRUE
J-2021	479: Zone-Main	TRUE	100	242	242	150	150	150	223	6014: 3891	TRUE
J-2022	479: Zone-Main	TRUE	No Hydrant	300	300	150	179	150	168	6834: 377340	TRUE
J-2023	479: Zone-Main	TRUE	100	300	300	150	178	150	171	6014: 3891	TRUE
J-2024	479: Zone-Main	TRUE	225	300	300	150	180	150	172	6014: 3891	TRUE
J-2025	479: Zone-Main	TRUE	100	300	301	150	184	150	173	6014: 3891	TRUE
J-2026	479: Zone-Main	TRUE	100	251	251	150	150	150	223	6014: 3891	TRUE
J-2027	479: Zone-Main	TRUE	185	291	292	150	150	150	161	6014: 3891	TRUE
J-2028	479: Zone-Main	TRUE	100	247	247	150	150	150	188	6014: 3891	TRUE
J-2029	479: Zone-Main	TRUE	100	225	226	150	150	150	227	6014: 3891	TRUE
J-2030	479: Zone-Main	TRUE	100	242	242	150	150	150	197	6014: 3891	TRUE
J-2031	479: Zone-Main	TRUE	100	245	246	150	172	150	150	2393: J-2128	TRUE
J-2032	479: Zone-Main	TRUE	100	221	221	150	150	150	155	2163: J-2036	TRUE
J-2033	479: Zone-Main	TRUE	100	221	221	150	150	150	160	2163: J-2036	TRUE
J-2034	479: Zone-Main	TRUE	100	213	213	150	150	150	172	2163: J-2036	TRUE
J-2035	479: Zone-Main	TRUE	100	211	213	150	150	150	155	2163: J-2036	TRUE
J-2036	479: Zone-Main	TRUE	100	179	179	150	150	150	186	2165: J-2037	TRUE
J-2037	479: Zone-Main	TRUE	100	175	175	150	150	150	190	2163: J-2036	TRUE
J-2038	479: Zone-Main	TRUE	100	178	178	150	150	150	185	2165: J-2037	TRUE
J-2039	479: Zone-Main	TRUE	No Hydrant	141	141	150	150	150	185	905: J-1538	TRUE
J-2041	479: Zone-Main	TRUE	225	248	248	150	150	150	150	499: J-322	TRUE
J-2042	479: Zone-Main	TRUE	100	200	200	150	150	150	183	6834: 377340	TRUE
J-2043	479: Zone-Main	TRUE	100	204	205	150	150	150	171	6834: 377340	TRUE
J-2044	479: Zone-Main	TRUE	100	249	249	150	151	150	150	6834: 377340	TRUE
J-2047	479: Zone-Main	TRUE	100	199	199	150	150	150	157	2193: J-2049	TRUE
J-2048	479: Zone-Main	TRUE	100	202	202	150	150	150	164	6834: 377340	TRUE
J-2049	479: Zone-Main	TRUE	100	172	172	150	150	150	164	2195: J-2050	TRUE
J-2050	479: Zone-Main	TRUE	No Hydrant	300	300	150	165	150	157	6834: 377340	TRUE
J-2051	479: Zone-Main	TRUE	100	164	165	150	150	150	168	2197: J-2051	TRUE
J-2052	479: Zone-Main	TRUE	100	158	158	150	150	150	187	2199: J-2052	TRUE
J-2053	479: Zone-Main	TRUE	100	158	158	150	150	150	185	2197: J-2051	TRUE
J-2054	479: Zone-Main	TRUE	100	165	165	150	150	150	162	2199: J-2052	TRUE
J-2055	479: Zone-Main	TRUE	100	175	176	150	150	150	159	2199: J-2052	TRUE
J-2056	479: Zone-Main	TRUE	100	196	196	150	150	150	157	2199: J-2052	TRUE
J-2057	479: Zone-Main	TRUE	No Hydrant	214	214	150	153	150	150	6834: 377340	TRUE
J-2058	479: Zone-Main	TRUE	No Hydrant	189	189	150	150	150	197	6834: 377340	TRUE
J-2059	479: Zone-Main	TRUE	185	261	261	150	192	150	150	6192: 116421	TRUE
J-2060	479: Zone-Main	TRUE	100	259	259	150	185	150	150	6834: 377340	TRUE
J-2061	479: Zone-Main	TRUE	100	255	255	150	188	150	150	6834: 377340	TRUE
J-2062	479: Zone-Main	TRUE	100	250	250	150	179	150	150	6834: 377340	TRUE
J-2063	479: Zone-Main	TRUE	100	248	249	150	174	150	150	6834: 377340	TRUE
J-2064	479: Zone-Main	TRUE	100	257	257	150	184	150	150	6834: 377340	TRUE
J-2065	479: Zone-Main	TRUE	100	216	216	150	155	150	150	6834: 377340	TRUE
J-2066	479: Zone-Main	TRUE	No Hydrant	210	210	150	160	150	150	6834: 377340	TRUE
J-2067	479: Zone-Main	TRUE	100	212	212	150	158	150	150	6834: 377340	TRUE
J-2068	479: Zone-Main	TRUE	185	245	245	150	168	150	150	6834: 377340	TRUE
J-2069	479: Zone-Main	TRUE	100	186	187	150	161	150	150	2259: J-2080	TRUE
J-2070	479: Zone-Main	FALSE	100	136	136	150	157	150	150	2259: J-2080	TRUE
J-2071	479: Zone-Main	TRUE	No Hydrant	126	126	150	150	150	182	2259: J-2080	TRUE
J-2072	479: Zone-Main	TRUE	225	265	265	150	197	150	150	6834: 377340	TRUE
J-2073	479: Zone-Main	TRUE	225	240	241	150	156	150	150	2251: J-2076	TRUE
J-2074	479: Zone-Main	TRUE	No Hydrant	185	185	150	150	150	181	2251: J-2076	TRUE
J-2075	479: Zone-Main	TRUE	No Hydrant	163	163	150	150	150	150	6834: 377340	TRUE
J-2076	479: Zone-Main	TRUE	No Hydrant	93	93	150	150	150	319	2249: J-2075	TRUE
J-2077	479: Zone-Main	TRUE	100	155	155	150	150	150	283	6834: 377340	TRUE
J-2078	479: Zone-Main	TRUE	100	152	152	150	150	150	284	6834: 377340	TRUE
J-2079	479: Zone-Main	TRUE	100	151	151	150	150	150	290	6834: 377340	TRUE
J-2080	479: Zone-Main	TRUE	100	280	280	150	150	150	160	6834: 377340	TRUE
J-2082	479: Zone-Main	FALSE	185	115	115	150	150	150	220	2238: J-2070	TRUE
J-2083	479: Zone-Main	TRUE	185	183	184	150	150	150	171	1106: J-1984	TRUE
J-2084	479: Zone-Main	FALSE	185	192	192	150	150	150	171	2269: J-2084	TRUE
J-2085	479: Zone-Main	TRUE	100	131	131	150	150	150	165	1109: J-1992	TRUE
J-2086	479: Zone-Main	FALSE	185	139	139	150	150	150	216	1057: J-1878	TRUE
J-2087	479: Zone-Main	TRUE	100	184	184	150	150	150	276	1074: J-1920	TRUE
J-2088	479: Zone-Main	FALSE	100	99	99	150	150	150	160	6834: 377340	TRUE
J-2089	479: Zone-Main	FALSE	225	179	180	150	150	150	311	6834: 377340	TRUE
J-2090	479: Zone-Main	TRUE	100	205	205	150	150	150	163	6834: 377340	TRUE
J-2091	479: Zone-Main	FALSE	100	98	98	150	150	150	311	6834: 377340	TRUE
J-2092	479: Zone-Main	TRUE	185	200	201	150	150	150	172	2288: J-2091	TRUE
J-2093	479: Zone-Main	TRUE	100	206	206	150	150	150	209	6834: 377340	TRUE
J-2094	479: Zone-Main	TRUE	100	107	108	150	150	150	307	6834: 377340	TRUE
J-2095	479: Zone-Main	FALSE	185	183	184	150	150	150	204	582: J-29	TRUE

Table C1: Existing System Model Fire Flow Results - Only West Reservoir Pumphouse Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-2096	479: Zone-Main	TRUE	No Hydrant	220	220	150	160	150	150	6834: 377340	TRUE
J-2097	479: Zone-Main	FALSE	225	75	75	150	163	150	150	2308: J-2098	TRUE
J-2098	479: Zone-Main	FALSE	225	39	40	150	150	150	339	2306: J-2097	TRUE
J-2099	479: Zone-Main	FALSE	225	218	218	150	150	150	196	6834: 377340	TRUE
J-21	479: Zone-Main	TRUE	No Hydrant	241	241	150	160	150	150	6834: 377340	TRUE
J-2100	479: Zone-Main	TRUE	100	112	113	150	150	150	304	6834: 377340	TRUE
J-2101	479: Zone-Main	TRUE	100	173	173	150	150	150	252	6834: 377340	TRUE
J-2102	479: Zone-Main	TRUE	100	148	148	150	150	150	283	6834: 377340	TRUE
J-2103	479: Zone-Main	TRUE	100	181	181	150	150	150	250	6834: 377340	TRUE
J-2105	479: Zone-Main	FALSE	225	220	220	150	150	150	191	2330: J-2106	TRUE
J-2106	479: Zone-Main	TRUE	100	112	112	150	150	150	303	6834: 377340	TRUE
J-2107	479: Zone-Main	FALSE	225	164	164	150	150	150	267	2330: J-2106	TRUE
J-2108	479: Zone-Main	FALSE	100	63	63	150	150	150	327	6834: 377340	TRUE
J-2109	479: Zone-Main	FALSE	225	136	136	150	150	150	185	2343: J-2110	TRUE
J-2110	479: Zone-Main	FALSE	225	114	114	150	150	150	183	2345: J-2111	TRUE
J-2111	479: Zone-Main	FALSE	225	118	119	150	150	150	162	2343: J-2110	TRUE
J-2112	479: Zone-Main	FALSE	225	131	131	150	150	150	150	2345: J-2111	TRUE
J-2113	479: Zone-Main	FALSE	225	43	43	150	150	150	164	18038: HYD_85	TRUE
J-2114	479: Zone-Main	FALSE	225	128	128	150	150	150	169	3220: J-2374	TRUE
J-2115	479: Zone-Main	FALSE	225	151	151	150	150	150	167	867: J-1462	TRUE
J-2116	479: Zone-Main	TRUE	100	120	120	150	156	150	150	18851: J-3989	TRUE
J-2117	479: Zone-Main	TRUE	100	118	118	150	150	150	186	3283: J-2395	TRUE
J-2118	479: Zone-Main	FALSE	100	87	88	150	150	150	281	3283: J-2395	TRUE
J-2119	479: Zone-Main	TRUE	100	128	128	150	150	150	175	3283: J-2395	TRUE
J-2120	479: Zone-Main	TRUE	100	122	122	150	150	150	176	2374: J-2121	TRUE
J-2121	479: Zone-Main	FALSE	100	85	85	150	150	150	237	2376: J-2122	TRUE
J-2122	479: Zone-Main	FALSE	100	86	87	150	150	150	234	2374: J-2121	TRUE
J-2123	479: Zone-Main	TRUE	100	122	122	150	150	150	167	2376: J-2122	TRUE
J-2124	479: Zone-Main	TRUE	100	239	239	150	192	150	150	6834: 377340	TRUE
J-2125	479: Zone-Main	TRUE	100	230	231	150	150	150	165	6834: 377340	TRUE
J-2126	479: Zone-Main	TRUE	100	240	240	150	161	150	150	6834: 377340	TRUE
J-2127	479: Zone-Main	TRUE	100	184	184	150	151	150	150	2393: J-2128	TRUE
J-2128	479: Zone-Main	TRUE	100	154	154	150	150	150	184	16615: J-3802	TRUE
J-2130	479: Zone-Main	FALSE	225	223	223	150	272	150	150	6834: 377340	TRUE
J-2131	479: Zone-Main	FALSE	100	68	68	150	150	150	318	6834: 377340	TRUE
J-2133	479: Zone-Main	TRUE	100	101	101	150	150	150	226	16442: J-3730	TRUE
J-2134	479: Zone-Main	TRUE	No Hydrant	196	196	150	150	150	213	6834: 377340	TRUE
J-2135	479: Zone-Main	TRUE	No Hydrant	220	220	150	253	150	150	6834: 377340	TRUE
J-2136	479: Zone-Main	TRUE	No Hydrant	176	176	150	150	150	217	6834: 377340	TRUE
J-2137	479: Zone-Main	FALSE	185	111	117	150	150	150	290	2419: J-2138	TRUE
J-2138	479: Zone-Main	TRUE	No Hydrant	154	154	150	150	150	258	6834: 377340	TRUE
J-2139	479: Zone-Main	FALSE	225	210	211	150	150	150	173	6834: 377340	TRUE
J-2141	479: Zone-Main	TRUE	No Hydrant	220	220	150	289	150	150	6834: 377340	TRUE
J-2142	479: Zone-Main	FALSE	225	220	220	150	289	150	150	18310: J-3888	TRUE
J-2143	479: Zone-Main	FALSE	225	172	173	150	150	150	234	18310: J-3888	TRUE
J-2152	479: Zone-Main	TRUE	No Hydrant	169	169	150	167	150	150	18310: J-3888	TRUE
J-217	479: Zone-Main	TRUE	100	259	260	150	150	150	170	6834: 377340	TRUE
J-2230	479: Zone-Main	TRUE	No Hydrant	259	259	150	150	150	213	6834: 377340	TRUE
J-2280	479: Zone-Main	TRUE	No Hydrant	197	197	150	154	150	150	16598: J-3795	TRUE
J-23	479: Zone-Main	TRUE	225	245	246	150	165	150	150	6834: 377340	TRUE
J-2309	479: Zone-Main	FALSE	225	143	143	150	160	150	150	7023: 393523	TRUE
J-2319	479: Zone-Main	TRUE	No Hydrant	81	81	150	150	150	249	2980: J-2320	TRUE
J-2320	479: Zone-Main	FALSE	225	86	87	150	150	150	229	2976: J-2319	TRUE
J-2321	479: Zone-Main	FALSE	225	93	94	150	150	150	306	3232: J-2378	TRUE
J-2322	479: Zone-Main	TRUE	100	113	114	150	150	150	302	6834: 377340	TRUE
J-2323	479: Zone-Main	FALSE	225	93	93	150	150	150	307	3235: J-2379	TRUE
J-2324	479: Zone-Main	TRUE	No Hydrant	88	88	150	150	150	161	18032: HYD_114	TRUE
J-2325	479: Zone-Main	FALSE	185	93	93	150	150	150	308	3241: J-2381	TRUE
J-2326	479: Zone-Main	TRUE	No Hydrant	199	199	150	150	150	214	6834: 377340	TRUE
J-2353	479: Zone-Main	FALSE	225	131	132	150	150	150	280	3162: J-2354	TRUE
J-2354	479: Zone-Main	FALSE	225	120	120	150	150	150	287	3159: J-2363	TRUE
J-2355	479: Zone-Main	FALSE	185	109	110	150	150	150	288	3168: J-2366	TRUE
J-2356	479: Zone-Main	FALSE	185	111	111	150	150	150	274	3165: J-2365	TRUE
J-2357	479: Zone-Main	TRUE	100	150	150	150	150	150	257	6834: 377340	TRUE
J-2358	479: Zone-Main	TRUE	100	107	108	150	150	150	272	3180: J-2360	TRUE
J-2359	479: Zone-Main	TRUE	100	146	147	150	150	150	272	6834: 377340	TRUE
J-2360	479: Zone-Main	TRUE	100	107	107	150	150	150	277	3174: J-2368	TRUE
J-2361	479: Zone-Main	TRUE	100	114	114	150	150	150	297	6834: 377340	TRUE
J-2362	479: Zone-Main	TRUE	100	141	141	150	150	150	233	6834: 377340	TRUE
J-2363	479: Zone-Main	TRUE	100	133	133	150	150	150	259	6834: 377340	TRUE
J-2364	479: Zone-Main	FALSE	185	164	165	150	150	150	270	6834: 377340	TRUE
J-2366	479: Zone-Main	FALSE	225	135	135	150	150	150	275	6834: 377340	TRUE
J-2367	479: Zone-Main	FALSE	225	179	180	150	150	150	195	555: J-271	TRUE
J-2368	479: Zone-Main	FALSE	225	103	104	150	150	150	269	3208: J-2370	TRUE
J-2369	479: Zone-Main	FALSE	185	152	153	150	150	150	271	6834: 377340	TRUE
J-2370	479: Zone-Main	TRUE	100	103	103	150	150	150	285	3202: J-2368	TRUE
J-2371	479: Zone-Main	TRUE	100	164	164	150	150	150	172	6834: 377340	TRUE
J-2372	479: Zone-Main	FALSE	225	225	225	150	253	150	150	6834: 377340	TRUE
J-2373	479: Zone-Main	FALSE	185	106	106	150	150	150	278	2986: J-2321	TRUE
J-2374	479: Zone-Main	FALSE	225	57	58	150	150	150	165	18038: HYD_85	TRUE
J-2375	479: Zone-Main	FALSE	225	106	107	150	150	150	269	2994: J-2323	TRUE
J-2376	479: Zone-Main	TRUE	No Hydrant	169	169	150	150	150	248	6834: 377340	TRUE
J-2377	479: Zone-Main	TRUE	No Hydrant	232	232	150	202	150	150	6834: 377340	TRUE
J-2378	479: Zone-Main	FALSE	225	105	105	150	150	150	256	2986: J-2321	TRUE
J-2379	479: Zone-Main	FALSE	225	104	104	150	150	150	254	2994: J-2323	TRUE
J-2380	479: Zone-Main	TRUE	No Hydrant	102	102	150	150	150	239	2997: J-2324	TRUE
J-2381	479: Zone-Main	FALSE	185	104	105	150	150	150	251	3000: J-2325	TRUE
J-2382	479: Zone-Main	TRUE	No Hydrant	94	94	150	150	150	166	18029: HYD_113	TRUE
J-2383	479: Zone-Main	FALSE	225	110	112	150	150	150	276	3000: J-2325	TRUE
J-2384	479: Zone-Main	FALSE	225	215	216	150	150	150	171	3003: J-2326	TRUE
J-2385	479: Zone-Main	FALSE	225	126	127	150	150	150	291	6834: 377340	TRUE

Table C1: Existing System Model Fire Flow Results - Only West Reservoir Pumphouse Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-2386	479: Zone-Main	TRUE	100	141	141	150	150	150	328	6834: 377340	TRUE
J-2387	479: Zone-Main	FALSE	100	100	100	150	150	150	334	6834: 377340	TRUE
J-2388	479: Zone-Main	FALSE	100	72	72	150	150	150	288	854: J-1436	TRUE
J-2389	479: Zone-Main	TRUE	100	111	111	150	150	150	325	6834: 377340	TRUE
J-2390	479: Zone-Main	TRUE	100	160	160	150	150	150	306	6834: 377340	TRUE
J-2391	479: Zone-Main	TRUE	100	102	102	150	150	150	324	6834: 377340	TRUE
J-2392	479: Zone-Main	FALSE	100	87	88	150	150	150	330	799: J-1300	TRUE
J-2393	479: Zone-Main	TRUE	100	101	102	150	150	150	332	6834: 377340	TRUE
J-2394	479: Zone-Main	TRUE	225	226	226	150	150	150	224	6834: 377340	TRUE
J-2395	479: Zone-Main	FALSE	100	92	92	150	150	150	273	2362: J-2117	TRUE
J-2396	479: Zone-Main	TRUE	100	116	116	150	150	150	319	6834: 377340	TRUE
J-2397	479: Zone-Main	TRUE	100	113	114	150	150	150	319	6834: 377340	TRUE
J-2398	479: Zone-Main	FALSE	100	92	93	150	150	150	324	6834: 377340	TRUE
J-2399	479: Zone-Main	TRUE	100	114	114	150	150	150	299	798: J-1298	TRUE
J-2400	479: Zone-Main	TRUE	225	246	246	150	150	150	150	6834: 377340	TRUE
J-2401	479: Zone-Main	TRUE	100	111	111	150	150	150	275	893: J-1514	TRUE
J-2402	479: Zone-Main	TRUE	225	270	271	150	165	150	150	6192: 116421	TRUE
J-2403	479: Zone-Main	FALSE	225	275	276	150	165	150	150	6192: 116421	TRUE
J-2404	479: Zone-Main	TRUE	225	188	189	150	150	150	258	585: J-104	TRUE
J-2405	479: Zone-Main	FALSE	225	238	239	150	150	150	185	6834: 377340	TRUE
J-2406	479: Zone-Main	FALSE	225	113	115	150	150	150	312	6834: 377340	TRUE
J-2407	479: Zone-Main	TRUE	100	114	115	150	150	150	302	6834: 377340	TRUE
J-2408	479: Zone-Main	TRUE	100	107	107	150	150	150	292	790: J-1282	TRUE
J-2410	479: Zone-Main	TRUE	100	114	114	150	150	150	275	790: J-1282	TRUE
J-2411	479: Zone-Main	FALSE	225	221	221	150	200	150	302	6834: 377340	TRUE
J-2412	479: Zone-Main	FALSE	185	150	150	150	150	150	150	18310: J-3888	TRUE
J-2413	479: Zone-Main	FALSE	185	124	124	150	150	150	260	6834: 377340	TRUE
J-2414	479: Zone-Main	FALSE	225	142	143	150	150	150	280	778: J-1256	TRUE
J-2415	479: Zone-Main	FALSE	225	121	122	150	150	150	267	545: J-284	TRUE
J-2416	479: Zone-Main	FALSE	225	173	174	150	150	150	283	867: J-1462	TRUE
J-2419	479: Zone-Main	FALSE	185	153	153	150	150	150	195	18310: J-3888	TRUE
J-2439	479: Zone-Main	TRUE	100	221	222	150	156	150	228	18345: J-3904	TRUE
J-2449	479: Zone-Main	TRUE	100	183	183	150	150	150	150	16598: J-3795	TRUE
J-25	479: Zone-Main	TRUE	No Hydrant	153	153	150	150	150	232	16598: J-3795	TRUE
J-2536	479: Zone-Main	TRUE	100	184	184	150	150	150	247	6834: 377340	TRUE
J-2539	479: Zone-Main	TRUE	100	189	189	150	150	150	227	16598: J-3795	TRUE
J-26	479: Zone-Main	TRUE	185	232	232	150	150	150	215	16598: J-3795	TRUE
J-2669	479: Zone-Main	TRUE	No Hydrant	167	167	150	150	150	181	6834: 377340	TRUE
J-267	479: Zone-Main	TRUE	No Hydrant	226	226	150	228	150	165	18310: J-3888	TRUE
J-268	479: Zone-Main	TRUE	No Hydrant	227	227	150	230	150	150	6834: 377340	TRUE
J-269	479: Zone-Main	TRUE	No Hydrant	227	227	150	235	150	150	6834: 377340	TRUE
J-27	479: Zone-Main	TRUE	225	227	229	150	150	150	169	2308: J-2098	TRUE
J-270	479: Zone-Main	FALSE	225	132	132	150	150	150	261	16622: J-3806	TRUE
J-271	479: Zone-Main	FALSE	225	174	174	150	150	150	216	3199: J-2367	TRUE
J-272	479: Zone-Main	TRUE	No Hydrant	189	189	150	150	150	201	6834: 377340	TRUE
J-2721	479: Zone-Main	TRUE	No Hydrant	173	173	150	164	150	150	18310: J-3888	TRUE
J-273	479: Zone-Main	TRUE	185	229	230	150	261	150	150	6834: 377340	TRUE
J-2731	479: Zone-Main	TRUE	No Hydrant	220	220	150	153	150	150	6834: 377340	TRUE
J-274	479: Zone-Main	TRUE	No Hydrant	244	244	150	213	150	150	16598: J-3795	TRUE
J-275	479: Zone-Main	TRUE	100	181	181	150	150	150	150	6834: 377340	TRUE
J-276	479: Zone-Main	FALSE	225	200	200	150	150	150	184	6834: 377340	TRUE
J-2762	479: Zone-Main	FALSE	225	172	172	150	151	150	157	870: J-1468	TRUE
J-2766	479: Zone-Main	TRUE	100	300	300	150	172	150	150	6635: 187778	TRUE
J-2787	479: Zone-Main	FALSE	225	141	141	150	150	150	160	6014: 3891	TRUE
J-28	479: Zone-Main	TRUE	225	275	275	150	164	150	184	6136: 110603	TRUE
J-280	479: Zone-Main	TRUE	No Hydrant	220	220	150	285	150	150	6192: 116421	TRUE
J-281	479: Zone-Main	TRUE	No Hydrant	220	220	150	286	150	150	6834: 377340	TRUE
J-282	479: Zone-Main	TRUE	No Hydrant	220	220	150	252	150	150	6834: 377340	TRUE
J-283	479: Zone-Main	FALSE	225	222	222	150	187	150	150	6834: 377340	TRUE
J-284	479: Zone-Main	TRUE	No Hydrant	186	186	150	150	150	170	6834: 377340	TRUE
J-285	479: Zone-Main	TRUE	No Hydrant	222	222	150	263	150	150	6834: 377340	TRUE
J-286	479: Zone-Main	TRUE	No Hydrant	166	166	150	150	150	214	6834: 377340	TRUE
J-2865	479: Zone-Main	TRUE	100	221	221	150	156	150	150	6834: 377340	TRUE
J-287	479: Zone-Main	FALSE	225	148	149	150	150	150	207	16598: J-3795	TRUE
J-288	479: Zone-Main	TRUE	No Hydrant	233	233	150	225	150	150	3223: J-2375	TRUE
J-289	479: Zone-Main	TRUE	No Hydrant	245	245	150	155	150	150	6834: 377340	TRUE
J-29	479: Zone-Main	FALSE	185	183	183	150	150	150	206	6834: 377340	TRUE
J-290	479: Zone-Main	FALSE	225	185	185	150	150	150	243	2299: J-2095	TRUE
J-291	479: Zone-Main	TRUE	No Hydrant	211	211	150	150	150	203	6834: 377340	TRUE
J-292	479: Zone-Main	TRUE	100	185	186	150	150	150	243	6834: 377340	TRUE
J-293	479: Zone-Main	FALSE	225	214	214	150	150	150	199	6834: 377340	TRUE
J-294	479: Zone-Main	TRUE	No Hydrant	162	162	150	150	150	277	2990: J-2322	TRUE
J-295	479: Zone-Main	FALSE	225	197	197	150	150	150	227	6834: 377340	TRUE
J-296	479: Zone-Main	TRUE	No Hydrant	219	219	150	150	150	193	2321: J-2103	TRUE
J-297	479: Zone-Main	TRUE	No Hydrant	229	229	150	150	150	154	6834: 377340	TRUE
J-298	479: Zone-Main	FALSE	185	145	147	150	150	150	289	582: J-29	TRUE
J-299	479: Zone-Main	TRUE	100	174	174	150	150	150	182	6834: 377340	TRUE
J-30	479: Zone-Main	TRUE	No Hydrant	182	182	150	150	150	175	6834: 377340	TRUE
J-300	479: Zone-Main	FALSE	185	156	156	150	150	150	259	16458: J-3737	TRUE
J-301	479: Zone-Main	TRUE	100	203	203	150	150	150	199	6834: 377340	TRUE
J-302	479: Zone-Main	TRUE	100	179	179	150	150	150	226	6834: 377340	TRUE
J-303	479: Zone-Main	TRUE	225	300	300	150	258	150	219	6834: 377340	TRUE
J-304	479: Zone-Main	TRUE	No Hydrant	300	300	150	262	150	222	6834: 377340	TRUE
J-305	479: Zone-Main	TRUE	No Hydrant	300	300	150	262	150	221	6834: 377340	TRUE
J-307	479: Zone-Main	TRUE	225	300	300	150	259	150	213	6834: 377340	TRUE
J-308	479: Zone-Main	TRUE	No Hydrant	300	300	150	260	150	213	6834: 377340	TRUE
J-309	479: Zone-Main	TRUE	No Hydrant	274	274	150	150	150	166	6834: 377340	TRUE
J-3095	479: Zone-Main	FALSE	225	157	157	150	170	150	150	6834: 377340	TRUE
J-31	479: Zone-Main	TRUE	No Hydrant	176	176	150	150	150	206	6834: 377340	TRUE
J-310	479: Zone-Main	FALSE	225	121	122	150	150	150	317	540: J-311	TRUE

Table C1: Existing System Model Fire Flow Results - Only West Reservoir Pumphouse Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-3100	479: Zone-Main	FALSE	225	167	167	150	150	150	155	6135: 110585	TRUE
J-311	479: Zone-Main	TRUE	No Hydrant	226	226	150	150	150	188	6834: 377340	TRUE
J-312	479: Zone-Main	TRUE	100	178	178	150	150	150	176	3295: J-2399	TRUE
J-3122	479: Zone-Main	TRUE	100	142	142	150	150	150	201	6731: 370154	TRUE
J-3127	479: Zone-Main	FALSE	225	169	169	150	167	150	150	6834: 377340	TRUE
J-313	479: Zone-Main	FALSE	225	212	212	150	150	150	169	498: J-312	TRUE
J-314	479: Zone-Main	TRUE	100	208	208	150	150	150	191	6834: 377340	TRUE
J-3140	479: Zone-Main	TRUE	100	218	218	150	150	150	158	16598: J-3795	TRUE
J-315	479: Zone-Main	TRUE	100	221	222	150	150	150	169	6834: 377340	TRUE
J-3153	479: Zone-Main	FALSE	225	177	177	150	150	150	193	14696: J-3323	TRUE
J-316	479: Zone-Main	TRUE	185	220	220	150	150	150	180	894: J-1516	TRUE
J-317	479: Zone-Main	TRUE	100	243	243	150	150	150	181	6834: 377340	TRUE
J-3178	479: Zone-Main	TRUE	100	262	262	150	150	150	159	6834: 377340	TRUE
J-318	479: Zone-Main	TRUE	No Hydrant	252	252	150	150	150	172	6834: 377340	TRUE
J-319	479: Zone-Main	TRUE	100	253	253	150	150	150	165	6834: 377340	TRUE
J-32	479: Zone-Main	TRUE	100	192	192	150	150	150	184	6834: 377340	TRUE
J-320	479: Zone-Main	TRUE	185	198	198	150	150	150	218	530: J-321	TRUE
J-321	479: Zone-Main	TRUE	100	198	198	150	150	150	219	6834: 377340	TRUE
J-3216	479: Zone-Main	FALSE	225	194	196	150	178	150	150	18345: J-3904	TRUE
J-322	479: Zone-Main	TRUE	No Hydrant	231	231	150	150	150	164	588: J-125	TRUE
J-323	479: Zone-Main	TRUE	No Hydrant	179	179	150	150	150	252	6834: 377340	TRUE
J-324	479: Zone-Main	TRUE	185	276	276	150	154	150	150	6834: 377340	TRUE
J-325	479: Zone-Main	TRUE	225	233	234	150	150	150	166	6834: 377340	TRUE
J-326	479: Zone-Main	TRUE	No Hydrant	243	243	150	210	150	150	6834: 377340	TRUE
J-3277	479: Zone-Main	TRUE	100	210	210	150	150	150	176	16598: J-3795	TRUE
J-328	479: Zone-Main	TRUE	No Hydrant	220	220	150	283	150	150	6834: 377340	TRUE
J-33	479: Zone-Main	TRUE	No Hydrant	256	256	150	151	150	150	6834: 377340	TRUE
J-330	479: Zone-Main	TRUE	No Hydrant	228	228	150	218	150	150	6834: 377340	TRUE
J-3302	479: Zone-Main	TRUE	100	213	213	150	150	150	175	6834: 377340	TRUE
J-3323	479: Zone-Main	FALSE	225	192	194	150	150	150	151	14134: J-3153	TRUE
J-34	479: Zone-Main	TRUE	185	219	220	150	161	150	150	563: J-35	TRUE
J-3449	479: Zone-Main	TRUE	100	221	221	150	156	150	150	16598: J-3795	TRUE
J-35	479: Zone-Main	FALSE	225	191	192	150	150	150	241	564: J-34	TRUE
J-36	479: Zone-Main	TRUE	225	266	266	150	185	150	150	6192: 116421	TRUE
J-3643	479: Zone-Main	FALSE	225	94	94	150	169	150	150	5951: 1680	TRUE
J-3656	479: Zone-Main	FALSE	225	177	177	150	204	150	150	18310: J-3888	TRUE
J-3659	479: Zone-Main	FALSE	225	176	176	150	150	150	151	637: J-131	TRUE
J-3668	479: Zone-Main	TRUE	100	211	211	150	150	150	174	16598: J-3795	TRUE
J-37	479: Zone-Main	TRUE	185	267	267	150	194	150	150	6834: 377340	TRUE
J-3705	479: Zone-Main	TRUE	100	253	253	150	189	150	150	6834: 377340	TRUE
J-3708	479: Zone-Main	FALSE	225	77	78	150	150	150	162	7007: 390267	TRUE
J-3709	479: Zone-Main	TRUE	100	230	230	150	156	150	150	6258: 127105	TRUE
J-3710	479: Zone-Main	TRUE	100	224	224	150	150	150	195	6014: 3891	TRUE
J-3711	479: Zone-Main	TRUE	100	263	263	150	150	150	166	6014: 3891	TRUE
J-3712	479: Zone-Main	TRUE	No Hydrant	300	300	150	177	150	159	6834: 377340	TRUE
J-3713	479: Zone-Main	TRUE	No Hydrant	300	300	150	181	150	166	6834: 377340	TRUE
J-3715	479: Zone-Main	TRUE	No Hydrant	224	224	150	176	150	150	6834: 377340	TRUE
J-3718	479: Zone-Main	FALSE	225	142	143	150	163	150	150	7023: 393523	TRUE
J-3719	479: Zone-Main	FALSE	225	168	169	150	150	150	152	14000: J-3100	TRUE
J-3720	479: Zone-Main	TRUE	No Hydrant	160	160	150	150	150	170	6834: 377340	TRUE
J-3721	479: Zone-Main	TRUE	No Hydrant	172	172	150	150	150	150	6834: 377340	TRUE
J-3722	479: Zone-Main	FALSE	225	175	176	150	151	150	150	6635: 187778	TRUE
J-3724	479: Zone-Main	FALSE	225	164	164	150	150	150	189	18310: J-3888	TRUE
J-3725	479: Zone-Main	FALSE	225	180	181	150	220	150	150	18310: J-3888	TRUE
J-3726	479: Zone-Main	TRUE	No Hydrant	187	187	150	150	150	172	6834: 377340	TRUE
J-3727	479: Zone-Main	TRUE	185	190	190	150	150	150	160	1105: J-1982	TRUE
J-3728	479: Zone-Main	TRUE	No Hydrant	184	184	150	150	150	152	6834: 377340	TRUE
J-3729	479: Zone-Main	TRUE	No Hydrant	144	144	150	150	150	269	6834: 377340	TRUE
J-3730	479: Zone-Main	TRUE	100	102	102	150	150	150	183	745: J-1184	TRUE
J-3731	479: Zone-Main	TRUE	100	101	102	150	150	150	255	874: J-1476	TRUE
J-3732	479: Zone-Main	TRUE	100	109	109	150	150	150	277	16447: J-3733	TRUE
J-3733	479: Zone-Main	TRUE	100	141	141	150	152	150	150	16446: J-3732	TRUE
J-3734	479: Zone-Main	TRUE	100	113	113	150	150	150	306	6834: 377340	TRUE
J-3735	479: Zone-Main	TRUE	100	118	118	150	150	150	303	6834: 377340	TRUE
J-3736	479: Zone-Main	TRUE	100	181	181	150	151	150	150	6834: 377340	TRUE
J-3737	479: Zone-Main	FALSE	100	80	80	150	150	150	322	6834: 377340	TRUE
J-3738	479: Zone-Main	FALSE	100	83	83	150	150	150	328	6834: 377340	TRUE
J-3739	479: Zone-Main	TRUE	100	157	157	150	150	150	236	6834: 377340	TRUE
J-3740	479: Zone-Main	TRUE	100	180	180	150	150	150	151	6834: 377340	TRUE
J-3741	479: Zone-Main	TRUE	No Hydrant	209	209	150	150	150	189	6834: 377340	TRUE
J-3742	479: Zone-Main	TRUE	No Hydrant	210	210	150	150	150	184	6834: 377340	TRUE
J-3743	479: Zone-Main	TRUE	100	221	221	150	150	150	151	6834: 377340	TRUE
J-3744	479: Zone-Main	TRUE	100	200	200	150	150	150	220	6834: 377340	TRUE
J-3745	479: Zone-Main	TRUE	100	202	202	150	150	150	218	6834: 377340	TRUE
J-3746	479: Zone-Main	FALSE	100	90	90	150	150	150	305	884: J-1496	TRUE
J-3747	479: Zone-Main	FALSE	100	68	69	150	150	150	324	883: J-1494	TRUE
J-3748	479: Zone-Main	FALSE	100	83	83	150	150	150	317	6834: 377340	TRUE
J-3749	479: Zone-Main	TRUE	100	176	177	150	150	150	192	6834: 377340	TRUE
J-3750	479: Zone-Main	TRUE	100	232	232	150	167	150	150	6834: 377340	TRUE
J-3751	479: Zone-Main	TRUE	100	233	233	150	170	150	150	6834: 377340	TRUE
J-3752	479: Zone-Main	TRUE	100	237	237	150	168	150	150	6834: 377340	TRUE
J-3753	479: Zone-Main	TRUE	100	236	236	150	163	150	150	6834: 377340	TRUE
J-3754	479: Zone-Main	TRUE	100	224	224	150	150	150	174	6834: 377340	TRUE
J-3755	479: Zone-Main	TRUE	100	216	216	150	150	150	187	6834: 377340	TRUE
J-3756	479: Zone-Main	TRUE	100	236	236	150	161	150	150	6834: 377340	TRUE
J-3757	479: Zone-Main	FALSE	225	188	188	150	150	150	236	16501: J-3758	TRUE
J-3758	479: Zone-Main	TRUE	225	232	232	150	153	150	150	16500: J-3757	TRUE
J-3759	479: Zone-Main	TRUE	No Hydrant	104	104	150	150	150	209	16515: J-3764	TRUE
J-3760	479: Zone-Main	TRUE	No Hydrant	154	154	150	155	150	150	6834: 377340	TRUE
J-3761	479: Zone-Main	TRUE	No Hydrant	223	223	150	150	150	150	6834: 377340	TRUE
J-3764	479: Zone-Main	TRUE	No Hydrant	114	114	150	151	150	150	16505: J-3759	TRUE

Table C1: Existing System Model Fire Flow Results - Only West Reservoir Pumphouse Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-3765	479: Zone-Main	TRUE	No Hydrant	90	90	150	150	150	301	16520: J-3766	TRUE
J-3766	479: Zone-Main	TRUE	No Hydrant	119	119	150	157	150	150	16519: J-3765	TRUE
J-3767	479: Zone-Main	TRUE	No Hydrant	136	136	150	156	150	150	6834: 377340	TRUE
J-3768	479: Zone-Main	TRUE	No Hydrant	162	162	150	151	150	150	6834: 377340	TRUE
J-3769	479: Zone-Main	FALSE	225	216	217	150	150	150	153	16519: J-3765	TRUE
J-3771	479: Zone-Main	TRUE	185	222	223	150	150	150	171	6834: 377340	TRUE
J-3772	479: Zone-Main	TRUE	No Hydrant	214	214	150	150	150	170	6834: 377340	TRUE
J-3773	479: Zone-Main	TRUE	No Hydrant	235	235	150	157	150	150	6834: 377340	TRUE
J-3774	479: Zone-Main	FALSE	185	173	174	150	150	150	168	6161: 111115	TRUE
J-3777	479: Zone-Main	TRUE	No Hydrant	180	180	150	150	150	300	6834: 377340	TRUE
J-3780	479: Zone-Main	TRUE	No Hydrant	273	273	150	155	150	150	6834: 377340	TRUE
J-3781	479: Zone-Main	TRUE	No Hydrant	280	280	150	150	150	162	6834: 377340	TRUE
J-3782	479: Zone-Main	TRUE	No Hydrant	300	300	150	178	150	163	6834: 377340	TRUE
J-3783	479: Zone-Main	TRUE	No Hydrant	277	277	150	150	150	190	6834: 377340	TRUE
J-3784	479: Zone-Main	TRUE	No Hydrant	255	255	150	150	150	220	6834: 377340	TRUE
J-3785	479: Zone-Main	TRUE	No Hydrant	291	291	150	150	150	163	6834: 377340	TRUE
J-3786	479: Zone-Main	TRUE	100	134	134	150	150	150	212	16580: J-3787	TRUE
J-3787	479: Zone-Main	TRUE	100	159	159	150	151	150	150	16579: J-3786	TRUE
J-3788	479: Zone-Main	TRUE	100	205	205	150	153	150	150	16584: J-3789	TRUE
J-3789	479: Zone-Main	TRUE	100	162	162	150	150	150	252	16579: J-3786	TRUE
J-3790	479: Zone-Main	TRUE	100	255	255	150	154	150	150	6834: 377340	TRUE
J-3791	479: Zone-Main	TRUE	100	130	130	150	150	150	203	16591: J-3792	TRUE
J-3792	479: Zone-Main	TRUE	100	149	149	150	150	150	154	16590: J-3791	TRUE
J-3793	479: Zone-Main	TRUE	100	177	177	150	152	150	150	16591: J-3792	TRUE
J-3794	479: Zone-Main	TRUE	100	151	151	150	150	150	216	16591: J-3792	TRUE
J-3795	479: Zone-Main	TRUE	100	122	122	150	150	150	235	16601: J-3797	TRUE
J-3796	479: Zone-Main	TRUE	100	161	161	150	161	150	150	16598: J-3795	TRUE
J-3797	479: Zone-Main	TRUE	100	133	133	150	150	150	210	16598: J-3795	TRUE
J-3798	479: Zone-Main	TRUE	100	220	220	150	150	150	151	16598: J-3795	TRUE
J-3799	479: Zone-Main	TRUE	100	224	224	150	163	150	150	16598: J-3795	TRUE
J-3800	479: Zone-Main	FALSE	225	90	90	150	161	150	150	16598: J-3795	TRUE
J-3801	479: Zone-Main	TRUE	No Hydrant	225	225	150	267	150	286	1112: J-1998	TRUE
J-3802	479: Zone-Main	TRUE	No Hydrant	100	100	150	150	150	150	6834: 377340	TRUE
J-3803	479: Zone-Main	TRUE	No Hydrant	100	100	150	150	150	150	6834: 377340	TRUE
J-3804	479: Zone-Main	FALSE	225	72	72	150	150	150	150	6834: 377340	TRUE
J-3806	479: Zone-Main	TRUE	No Hydrant	148	148	150	150	150	155	6834: 377340	TRUE
J-3807	479: Zone-Main	TRUE	No Hydrant	73	73	150	157	150	150	16621: J-3805	TRUE
J-3808	479: Zone-Main	FALSE	225	74	75	150	172	150	150	18071: J-3861	TRUE
J-3809	479: Zone-Main	FALSE	185	108	109	150	150	150	298	6834: 377340	TRUE
J-3810	479: Zone-Main	TRUE	No Hydrant	208	208	150	150	150	191	6834: 377340	TRUE
J-3811	479: Zone-Main	TRUE	185	233	233	150	225	150	150	6834: 377340	TRUE
J-3812	479: Zone-Main	FALSE	185	100	100	150	150	150	303	6834: 377340	TRUE
J-3813	479: Zone-Main	TRUE	No Hydrant	233	233	150	153	150	150	6834: 377340	TRUE
J-3814	479: Zone-Main	TRUE	225	241	241	150	150	150	192	6834: 377340	TRUE
J-3815	479: Zone-Main	FALSE	225	113	113	150	150	150	167	18041: HYD_35	TRUE
J-3816	479: Zone-Main	FALSE	225	198	198	150	150	150	199	6834: 377340	TRUE
J-3817	479: Zone-Main	TRUE	100	242	242	150	150	150	155	6834: 377340	TRUE
J-3818	479: Zone-Main	FALSE	225	181	182	150	150	150	156	18044: HYD_45	TRUE
J-3819	16642: Zone-Pumphouse	TRUE	No Hydrant	300	300	150	257	150	257	16675: J-3822	TRUE
J-3820	16642: Zone-Pumphouse	TRUE	No Hydrant	300	300	150	257	150	257	16675: J-3822	TRUE
J-3821	16642: Zone-Pumphouse	TRUE	No Hydrant	300	300	150	257	150	257	16675: J-3822	TRUE
J-3822	16642: Zone-Pumphouse	TRUE	No Hydrant	300	300	150	257	150	257	16674: J-3821	TRUE
J-3823	479: Zone-Main	TRUE	No Hydrant	231	231	150	217	150	150	6834: 377340	TRUE
J-3824	479: Zone-Main	TRUE	No Hydrant	232	232	150	206	150	150	6834: 377340	TRUE
J-3825	479: Zone-Main	TRUE	No Hydrant	232	232	150	203	150	150	6834: 377340	TRUE
J-3826	479: Zone-Main	TRUE	No Hydrant	233	233	150	215	150	150	6834: 377340	TRUE
J-3827	479: Zone-Main	TRUE	No Hydrant	196	196	150	150	150	211	6834: 377340	TRUE
J-3832	479: Zone-Main	TRUE	No Hydrant	300	300	150	219	150	204	6834: 377340	TRUE
J-3834	479: Zone-Main	TRUE	No Hydrant	300	300	150	253	150	232	6834: 377340	TRUE
J-3855	479: Zone-Main	FALSE	225	72	72	150	156	150	150	18071: J-3861	TRUE
J-3856	479: Zone-Main	FALSE	225	71	71	150	162	150	150	18071: J-3861	TRUE
J-3857	479: Zone-Main	TRUE	No Hydrant	70	70	150	164	150	150	18071: J-3861	TRUE
J-3858	479: Zone-Main	TRUE	No Hydrant	71	71	150	154	150	150	18071: J-3861	TRUE
J-3859	479: Zone-Main	TRUE	No Hydrant	71	71	150	156	150	150	18070: J-3860	TRUE
J-3860	479: Zone-Main	TRUE	No Hydrant	69	69	150	150	150	157	18071: J-3861	TRUE
J-3861	479: Zone-Main	TRUE	No Hydrant	69	69	150	150	150	159	18070: J-3860	TRUE
J-3862	479: Zone-Main	FALSE	225	97	97	150	150	150	191	18073: J-3863	TRUE
J-3863	479: Zone-Main	FALSE	225	102	102	150	158	150	150	18072: J-3862	TRUE
J-3864	479: Zone-Main	FALSE	225	110	111	150	159	150	150	18072: J-3862	TRUE
J-3865	479: Zone-Main	TRUE	No Hydrant	176	176	150	150	150	219	6834: 377340	TRUE
J-3870	479: Zone-Main	TRUE	No Hydrant	211	211	150	150	150	170	6834: 377340	TRUE
J-3871	479: Zone-Main	TRUE	No Hydrant	229	229	150	217	150	150	6834: 377340	TRUE
J-3881	479: Zone-Main	TRUE	No Hydrant	162	162	150	150	150	191	6834: 377340	TRUE
J-3887	479: Zone-Main	TRUE	No Hydrant	126	126	150	164	150	150	6834: 377340	TRUE
J-3888	479: Zone-Main	TRUE	No Hydrant	166	166	150	150	150	176	6834: 377340	TRUE
J-3890	479: Zone-Main	TRUE	No Hydrant	229	229	150	177	150	150	6834: 377340	TRUE
J-3891	479: Zone-Main	TRUE	No Hydrant	226	226	150	181	150	150	6834: 377340	TRUE
J-3892	479: Zone-Main	TRUE	No Hydrant	212	212	150	150	150	192	6834: 377340	TRUE
J-3893	479: Zone-Main	TRUE	No Hydrant	229	229	150	170	150	150	6834: 377340	TRUE
J-3894	479: Zone-Main	TRUE	No Hydrant	230	230	150	161	150	150	6834: 377340	TRUE
J-3895	479: Zone-Main	TRUE	No Hydrant	193	193	150	150	150	222	6834: 377340	TRUE
J-3896	479: Zone-Main	TRUE	No Hydrant	174	174	150	228	150	150	18310: J-3888	TRUE
J-3897	479: Zone-Main	TRUE	No Hydrant	220	220	150	151	150	150	16598: J-3795	TRUE
J-3898	479: Zone-Main	TRUE	No Hydrant	220	220	150	152	150	150	16598: J-3795	TRUE
J-3899	479: Zone-Main	TRUE	No Hydrant	157	157	150	150	150	243	16598: J-3795	TRUE
J-39	479: Zone-Main	FALSE	225	118	118	150	150	150	185	561: J-38	TRUE
J-3900	479: Zone-Main	TRUE	No Hydrant	181	181	150	156	150	150	18341: J-3902	TRUE
J-3901	479: Zone-Main	TRUE	No Hydrant	162	162	150	150	150	203	18341: J-3902	TRUE
J-3902	479: Zone-Main	TRUE	No Hydrant	175	175	150	150	150	176	18337: J-3900	TRUE

Table C1: Existing System Model Fire Flow Results - Only West Reservoir Pumphouse Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-3903	479: Zone-Main	TRUE	No Hydrant	167	167	150	177	150	150	6834: 377340	TRUE
J-3904	479: Zone-Main	TRUE	No Hydrant	158	158	150	150	150	197	6834: 377340	TRUE
J-3905	479: Zone-Main	TRUE	No Hydrant	165	165	150	154	150	150	6834: 377340	TRUE
J-3906	479: Zone-Main	TRUE	No Hydrant	168	168	150	176	150	150	6834: 377340	TRUE
J-3907	479: Zone-Main	TRUE	No Hydrant	297	297	150	159	150	150	6014: 3891	TRUE
J-3908	479: Zone-Main	TRUE	No Hydrant	215	215	150	150	150	263	6014: 3891	TRUE
J-3909	479: Zone-Main	TRUE	No Hydrant	209	209	150	150	150	269	6014: 3891	TRUE
J-3910	479: Zone-Main	TRUE	No Hydrant	285	285	150	150	150	154	6014: 3891	TRUE
J-3911	479: Zone-Main	TRUE	No Hydrant	180	180	150	150	150	166	6834: 377340	TRUE
J-3914	479: Zone-Main	TRUE	No Hydrant	243	243	150	220	150	150	6834: 377340	TRUE
J-3915	479: Zone-Main	TRUE	No Hydrant	261	261	150	166	150	150	6834: 377340	TRUE
J-3916	479: Zone-Main	TRUE	No Hydrant	239	239	150	152	150	150	6834: 377340	TRUE
J-3933	479: Zone-Main	TRUE	No Hydrant	168	168	150	150	150	170	6834: 377340	TRUE
J-3936	479: Zone-Main	TRUE	No Hydrant	186	186	150	150	150	157	6834: 377340	TRUE
J-3937	479: Zone-Main	TRUE	No Hydrant	239	239	150	182	150	150	6834: 377340	TRUE
J-3943	479: Zone-Main	TRUE	No Hydrant	215	215	150	153	150	150	858: J-1444	TRUE
J-3956	479: Zone-Main	TRUE	No Hydrant	214	214	150	150	150	193	18530: J-3958	TRUE
J-3957	479: Zone-Main	TRUE	No Hydrant	284	284	150	153	150	150	6014: 3891	TRUE
J-3958	479: Zone-Main	TRUE	No Hydrant	211	211	150	150	150	207	18525: J-3956	TRUE
J-3959	479: Zone-Main	TRUE	No Hydrant	209	209	150	153	150	150	18536: J-3962	TRUE
J-3960	479: Zone-Main	TRUE	No Hydrant	177	177	150	150	150	226	18536: J-3962	TRUE
J-3961	479: Zone-Main	TRUE	No Hydrant	199	199	150	151	150	150	18536: J-3962	TRUE
J-3962	479: Zone-Main	TRUE	No Hydrant	172	172	150	150	150	214	18536: J-3961	TRUE
J-3963	479: Zone-Main	TRUE	No Hydrant	172	172	150	150	150	213	18536: J-3962	TRUE
J-3964	479: Zone-Main	TRUE	No Hydrant	181	181	150	150	150	204	18545: J-3965	TRUE
J-3965	479: Zone-Main	TRUE	No Hydrant	203	203	150	150	150	152	18543: J-3964	TRUE
J-3966	479: Zone-Main	TRUE	No Hydrant	300	300	150	174	150	156	6834: 377340	TRUE
J-3967	479: Zone-Main	TRUE	No Hydrant	220	220	150	150	150	171	18545: J-3965	TRUE
J-3968	479: Zone-Main	TRUE	No Hydrant	300	300	150	176	150	156	6834: 377340	TRUE
J-3969	479: Zone-Main	TRUE	No Hydrant	227	227	150	150	150	251	6834: 377340	TRUE
J-3970	479: Zone-Main	TRUE	No Hydrant	236	236	150	173	150	150	6834: 377340	TRUE
J-3971	479: Zone-Main	TRUE	No Hydrant	216	216	150	150	150	186	6834: 377340	TRUE
J-3974	479: Zone-Main	TRUE	185	221	221	150	272	150	150	6834: 377340	TRUE
J-3987	479: Zone-Main	TRUE	No Hydrant	236	236	150	205	150	150	6834: 377340	TRUE
J-3989	479: Zone-Main	TRUE	No Hydrant	69	69	150	150	150	318	2359: J-2116	TRUE
J-40	479: Zone-Main	TRUE	No Hydrant	216	216	150	320	150	150	6834: 377340	TRUE
J-4004	479: Zone-Main	TRUE	No Hydrant	226	226	150	236	150	150	6834: 377340	TRUE
J-4008	479: Zone-Main	TRUE	No Hydrant	222	222	150	296	150	150	6834: 377340	TRUE
J-4014	479: Zone-Main	TRUE	No Hydrant	207	207	150	205	150	150	6834: 377340	TRUE
J-4034	479: Zone-Main	TRUE	No Hydrant	210	210	150	150	150	203	6834: 377340	TRUE
J-4035	479: Zone-Main	TRUE	No Hydrant	239	239	150	162	150	150	6834: 377340	TRUE
J-4036	479: Zone-Main	TRUE	No Hydrant	177	177	150	155	150	150	6834: 377340	TRUE
J-4037	479: Zone-Main	TRUE	No Hydrant	25	25	150	150	150	342	6834: 377340	TRUE
J-4039	479: Zone-Main	TRUE	225	241	241	150	150	150	174	19098: J-4040	TRUE
J-4040	479: Zone-Main	TRUE	No Hydrant	248	248	150	150	150	157	19115: J-4045	TRUE
J-4041	479: Zone-Main	TRUE	No Hydrant	246	246	150	150	150	176	19115: J-4045	TRUE
J-4044	479: Zone-Main	TRUE	No Hydrant	106	106	150	150	150	192	19115: J-4045	TRUE
J-4045	479: Zone-Main	TRUE	No Hydrant	73	73	150	150	150	289	19112: J-4044	TRUE
J-4047	479: Zone-Main	TRUE	No Hydrant	222	222	150	150	150	271	19115: J-4045	TRUE
J-4048	479: Zone-Main	TRUE	No Hydrant	69	69	150	150	150	365	19115: J-4045	TRUE
J-4049	479: Zone-Main	TRUE	No Hydrant	282	282	150	150	150	164	19115: J-4045	TRUE
J-4051	479: Zone-Main	TRUE	No Hydrant	220	220	150	150	150	208	19115: J-4045	TRUE
J-4052	479: Zone-Main	TRUE	No Hydrant	235	235	150	153	150	150	19115: J-4045	TRUE
J-4053	479: Zone-Main	TRUE	No Hydrant	221	221	150	150	150	196	19115: J-4045	TRUE
J-4058	479: Zone-Main	TRUE	No Hydrant	300	300	150	182	150	205	19115: J-4045	TRUE
J-4059	479: Zone-Main	TRUE	No Hydrant	237	237	150	151	150	150	19115: J-4045	TRUE
J-4066	479: Zone-Main	TRUE	No Hydrant	156	156	150	150	150	150	19196: J-4067	TRUE
J-4067	479: Zone-Main	TRUE	No Hydrant	156	156	150	150	150	150	19194: J-4066	TRUE
J-4071	479: Zone-Main	TRUE	No Hydrant	236	236	150	150	150	155	19115: J-4045	TRUE
J-41	479: Zone-Main	TRUE	No Hydrant	215	215	150	318	150	150	6834: 377340	TRUE
J-42	479: Zone-Main	FALSE	225	192	192	150	150	150	189	18195: HYD_275	TRUE
J-43	479: Zone-Main	FALSE	225	159	160	150	150	150	231	18053: HYD_303	TRUE
J-44	479: Zone-Main	TRUE	No Hydrant	205	205	150	287	150	150	6834: 377340	TRUE
J-45	479: Zone-Main	FALSE	225	180	181	150	150	150	195	18231: HYD_279	TRUE
J-46	479: Zone-Main	TRUE	No Hydrant	200	200	150	150	150	153	6834: 377340	TRUE
J-47	479: Zone-Main	FALSE	225	196	196	150	278	150	150	18310: J-3888	TRUE
J-48	479: Zone-Main	TRUE	No Hydrant	192	192	150	305	150	150	18310: J-3888	TRUE
J-49	479: Zone-Main	FALSE	225	179	179	150	171	150	150	2074: J-1999	TRUE
J-50	479: Zone-Main	TRUE	100	160	160	150	166	150	150	18310: J-3888	TRUE
J-51	479: Zone-Main	FALSE	225	160	160	150	151	150	150	2074: J-1999	TRUE
J-52	479: Zone-Main	FALSE	225	221	221	150	155	150	150	6834: 377340	TRUE
J-54	479: Zone-Main	FALSE	225	223	223	150	283	150	150	6834: 377340	TRUE
J-55	479: Zone-Main	FALSE	225	225	225	150	233	150	150	6834: 377340	TRUE
J-56	479: Zone-Main	FALSE	225	223	224	150	278	150	150	6834: 377340	TRUE
J-57	479: Zone-Main	TRUE	225	227	228	150	265	150	150	6834: 377340	TRUE
J-58	479: Zone-Main	TRUE	No Hydrant	233	233	150	228	150	150	6834: 377340	TRUE
J-59	479: Zone-Main	TRUE	No Hydrant	235	235	150	223	150	150	6834: 377340	TRUE
J-60	479: Zone-Main	TRUE	No Hydrant	240	240	150	201	150	150	6834: 377340	TRUE
J-61	479: Zone-Main	FALSE	225	220	227	150	236	150	150	6834: 377340	TRUE
J-62	479: Zone-Main	TRUE	185	232	232	150	167	150	150	6834: 377340	TRUE
J-63	479: Zone-Main	TRUE	100	239	239	150	210	150	150	6834: 377340	TRUE
J-64	479: Zone-Main	FALSE	225	201	202	150	224	150	150	6834: 377340	TRUE
J-65	479: Zone-Main	FALSE	225	113	114	150	150	150	151	709: J-1108	TRUE
J-66	479: Zone-Main	FALSE	225	197	197	150	229	150	150	6834: 377340	TRUE
J-67	479: Zone-Main	TRUE	No Hydrant	184	184	150	150	150	163	6834: 377340	TRUE
J-68	479: Zone-Main	FALSE	225	201	201	150	150	150	166	554: J-272	TRUE
J-69	479: Zone-Main	FALSE	225	169	169	150	150	150	239	674: J-68	TRUE
J-7	479: Zone-Main	TRUE	No Hydrant	220	220	150	347	150	150	6834: 377340	TRUE
J-70	479: Zone-Main	FALSE	225	218	219	150	152	150	150	6834: 377340	TRUE
J-71	479: Zone-Main	TRUE	No Hydrant	216	216	150	199	150	150	6834: 377340	TRUE
J-72	479: Zone-Main	FALSE	225	222	223	150	150	150	173	3316: J-2406	TRUE

Table C1: Existing System Model Fire Flow Results - Only West Reservoir Pumphouse Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-73	479: Zone-Main	TRUE	225	245	245	150	176	150	150	6834: 377340	TRUE
J-74	479: Zone-Main	TRUE	225	230	231	150	166	150	150	6834: 377340	TRUE
J-75	479: Zone-Main	TRUE	No Hydrant	260	260	150	166	150	150	6834: 377340	TRUE
J-76	479: Zone-Main	FALSE	225	151	151	150	150	150	265	1048: J-1880	TRUE
J-77	479: Zone-Main	TRUE	No Hydrant	300	300	150	183	150	180	6834: 377340	TRUE
J-78	479: Zone-Main	TRUE	225	300	300	150	189	150	181	6014: 3891	TRUE
J-79	479: Zone-Main	TRUE	225	237	239	150	150	150	164	6834: 377340	TRUE
J-8	479: Zone-Main	TRUE	No Hydrant	220	220	150	348	150	150	6834: 377340	TRUE
J-80	479: Zone-Main	TRUE	No Hydrant	229	229	150	150	150	177	6834: 377340	TRUE
J-81	479: Zone-Main	TRUE	No Hydrant	248	248	150	210	150	150	6834: 377340	TRUE
J-82	479: Zone-Main	TRUE	225	247	250	150	214	150	150	6834: 377340	TRUE
J-83	479: Zone-Main	TRUE	225	252	252	150	150	150	153	6834: 377340	TRUE
J-84	479: Zone-Main	TRUE	225	255	255	150	164	150	150	6834: 377340	TRUE
J-85	479: Zone-Main	TRUE	225	251	251	150	150	150	175	6834: 377340	TRUE
J-86	479: Zone-Main	TRUE	225	286	287	150	179	150	150	6834: 377340	TRUE
J-87	479: Zone-Main	TRUE	225	300	300	150	238	150	202	6834: 377340	TRUE
J-88	479: Zone-Main	TRUE	225	300	301	150	256	150	219	6834: 377340	TRUE
J-9	479: Zone-Main	TRUE	No Hydrant	220	220	150	349	150	150	6834: 377340	TRUE
J-90	479: Zone-Main	TRUE	225	252.69	253.66	150	171.9	150	150	6834: 377340	TRUE
J-91	479: Zone-Main	FALSE	225	203.37	204.18	150	150.1	150	183	621: J-25	TRUE
J-92	479: Zone-Main	TRUE	225	256.25	256.25	150	165.5	150	150.1	6834: 377340	TRUE
J-93	479: Zone-Main	TRUE	No Hydrant	236.22	236.22	150	150	150	180.6	6834: 377340	TRUE
J-94	479: Zone-Main	TRUE	No Hydrant	213.49	213.49	150	150.1	150	158.4	6834: 377340	TRUE
J-95	479: Zone-Main	FALSE	225	211.98	212.44	150	150.1	150	191.1	891: J-1510	TRUE
J-96	479: Zone-Main	FALSE	225	208.51	209.1	150	150.1	150	224.1	607: J-95	TRUE
J-97	479: Zone-Main	TRUE	225	257.2	259.27	150	150	150	154.7	6834: 377340	TRUE
J-98	479: Zone-Main	TRUE	No Hydrant	262.23	262.23	150	153	150	150	6834: 377340	TRUE
J-99	479: Zone-Main	TRUE	225	247.25	247.25	150	150	150	175.2	6834: 377340	TRUE
WTP2_dumb node	479: Zone-Main	TRUE	No Hydrant	219.88	219.88	150	363.7	150	150	6834: 377340	TRUE

Note:

- The maximum fire flow tested is 300 L/s. High fire flows may be possible if residual and zone pressures are still greater than 150 kPa when 300 L/s is reached.

Table C2: Existing System Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
1587	479: Zone-Main	TRUE	225	264	265	150	150	150	158	14696: J-3223	TRUE
1680	479: Zone-Main	TRUE	No Hydrant	66	66	150	150	150	362	15778: J-3643	TRUE
1833	479: Zone-Main	TRUE	225	290	290	150	184	150	360	6834: 377340	TRUE
2955	479: Zone-Main	TRUE	No Hydrant	300	300	150	201	150	212	6014: 3891	TRUE
3018	479: Zone-Main	FALSE	225	134	135	150	170	150	150	5951: 1680	TRUE
3021	479: Zone-Main	FALSE	225	125	125	150	166	150	150	5951: 1680	TRUE
3144	479: Zone-Main	FALSE	225	163	163	150	165	150	150	7023: 393523	TRUE
3891	479: Zone-Main	TRUE	No Hydrant	300	300	150	264	150	272	18530: J-3958	TRUE
6363	479: Zone-Main	TRUE	No Hydrant	272	272	150	150	150	151	5948: 1587	TRUE
106989	479: Zone-Main	TRUE	225	300	300	150	250	150	271	6118: 107003	TRUE
107003	479: Zone-Main	TRUE	225	300	300	150	271	150	264	6116: 106989	TRUE
107051	479: Zone-Main	TRUE	225	300	301	150	292	150	277	6116: 106989	TRUE
107073	479: Zone-Main	TRUE	225	300	300	150	314	150	298	18536: J-3962	TRUE
107118	479: Zone-Main	TRUE	225	300	300	150	315	150	296	18536: J-3962	TRUE
107136	479: Zone-Main	TRUE	100	300	300	150	318	150	305	6014: 3891	TRUE
110585	479: Zone-Main	FALSE	225	177	178	150	150	150	155	6136: 110603	TRUE
110603	479: Zone-Main	FALSE	225	169	170	150	150	150	154	13252: J-2787	TRUE
110726	479: Zone-Main	TRUE	100	300	301	150	258	150	264	6014: 3891	TRUE
110817	479: Zone-Main	TRUE	100	300	300	150	168	150	153	6014: 3891	TRUE
110821	479: Zone-Main	TRUE	No Hydrant	300	300	150	228	150	213	6014: 3891	TRUE
110827	479: Zone-Main	TRUE	100	188	188	150	158	150	150	6192: 116421	TRUE
111105	479: Zone-Main	TRUE	185	229	229	150	153	150	150	6161: 111115	TRUE
111115	479: Zone-Main	TRUE	100	179	179	150	150	150	192	6165: 111123	TRUE
111121	479: Zone-Main	TRUE	100	181	181	150	154	150	150	6165: 111123	TRUE
111123	479: Zone-Main	TRUE	No Hydrant	163	163	150	169	150	225	6014: 3891	TRUE
111129	479: Zone-Main	TRUE	185	190	190	150	150	150	173	6165: 111123	TRUE
111519	479: Zone-Main	TRUE	100	300	301	150	190	150	289	6014: 3891	TRUE
116132	479: Zone-Main	TRUE	No Hydrant	300	300	150	222	150	209	6014: 3891	TRUE
116323	479: Zone-Main	TRUE	100	300	300	150	166	150	173	6014: 3891	TRUE
116331	479: Zone-Main	TRUE	100	285	285	150	150	150	185	6014: 3891	TRUE
116355	479: Zone-Main	TRUE	100	237	237	150	160	150	150	6192: 116421	TRUE
116381	479: Zone-Main	TRUE	100	166	166	150	153	150	150	6199: 117256	TRUE
116421	479: Zone-Main	TRUE	100	167	167	150	150	150	199	6199: 117256	TRUE
116465	479: Zone-Main	TRUE	100	285	285	150	150	150	165	6014: 3891	TRUE
117256	479: Zone-Main	TRUE	100	158	158	150	150	150	197	6187: 116381	TRUE
121664	479: Zone-Main	TRUE	225	300	300	150	206	150	232	6371: 158061	TRUE
127105	479: Zone-Main	TRUE	100	203	204	150	150	150	268	6014: 3891	TRUE
134621	479: Zone-Main	TRUE	100	300	300	150	178	150	173	2393: J-2128	TRUE
149113	479: Zone-Main	TRUE	No Hydrant	300	300	150	190	150	206	6014: 3891	TRUE
149174	479: Zone-Main	TRUE	100	300	300	150	212	150	202	6014: 3891	TRUE
157379	479: Zone-Main	TRUE	100	267	267	150	150	150	172	6014: 3891	TRUE
158061	479: Zone-Main	TRUE	225	233	233	150	150	150	278	16591: J-3792	TRUE
158622	479: Zone-Main	TRUE	100	261	261	150	150	150	151	6014: 3891	TRUE
158655	479: Zone-Main	TRUE	100	224	224	150	150	150	248	6014: 3891	TRUE
158661	479: Zone-Main	TRUE	100	213	213	150	150	150	228	6014: 3891	TRUE
158948	479: Zone-Main	TRUE	100	289	289	150	152	150	150	6014: 3891	TRUE
158958	479: Zone-Main	TRUE	100	277	277	150	150	150	169	6014: 3891	TRUE
166366	479: Zone-Main	TRUE	100	300	300	150	184	150	248	6014: 3891	TRUE
166368	479: Zone-Main	TRUE	100	300	300	150	248	150	247	6014: 3891	TRUE
166379	479: Zone-Main	TRUE	100	297	297	150	150	150	194	2393: J-2128	TRUE
166395	479: Zone-Main	TRUE	100	300	300	150	235	150	241	6014: 3891	TRUE
166491	479: Zone-Main	TRUE	100	300	300	150	242	150	259	6014: 3891	TRUE
167243	479: Zone-Main	TRUE	225	297	298	150	150	150	177	6834: 377340	TRUE
186795	479: Zone-Main	TRUE	225	300	300	150	208	150	205	6371: 158061	TRUE
186797	479: Zone-Main	TRUE	No Hydrant	234	234	150	152	150	150	6014: 3891	TRUE
187566	479: Zone-Main	FALSE	225	204	205	150	150	150	157	16393: J-3721	TRUE
187588	479: Zone-Main	FALSE	225	211	211	150	152	150	150	6651: 186078	TRUE
187660	479: Zone-Main	FALSE	225	207	207	150	150	150	153	13184: J-2762	TRUE
187778	479: Zone-Main	TRUE	No Hydrant	193	193	150	150	150	169	6014: 3891	TRUE
187780	479: Zone-Main	TRUE	No Hydrant	187	187	150	150	150	173	6014: 3891	TRUE
188078	479: Zone-Main	TRUE	No Hydrant	209	209	150	150	150	151	6014: 3891	TRUE
366501	479: Zone-Main	TRUE	225	300	300	150	217	150	193	6834: 377340	TRUE
366751	479: Zone-Main	TRUE	225	300	301	150	188	150	192	6834: 377340	TRUE
366769	479: Zone-Main	TRUE	No Hydrant	300	300	150	166	150	189	6014: 3891	TRUE
366848	479: Zone-Main	TRUE	225	290	291	150	150	150	194	6834: 377340	TRUE
369028	479: Zone-Main	TRUE	225	251	251	150	152	150	150	12899: J-2669	TRUE
369034	479: Zone-Main	TRUE	No Hydrant	257	257	150	156	150	150	18310: J-3888	TRUE
369038	479: Zone-Main	TRUE	225	274	274	150	152	150	150	18310: J-3888	TRUE
369042	479: Zone-Main	TRUE	225	279	279	150	196	150	150	18310: J-3888	TRUE
369044	479: Zone-Main	TRUE	No Hydrant	281	281	150	215	150	150	6014: 3891	TRUE
369046	479: Zone-Main	TRUE	225	281	281	150	214	150	150	18310: J-3888	TRUE
369052	479: Zone-Main	TRUE	225	280	280	150	220	150	150	18310: J-3888	TRUE
369094	479: Zone-Main	TRUE	225	281	281	150	219	150	150	18310: J-3888	TRUE
369098	479: Zone-Main	TRUE	225	281	281	150	218	150	150	18310: J-3888	TRUE
369316	479: Zone-Main	TRUE	225	285	285	150	170	150	150	18310: J-3888	TRUE
369364	479: Zone-Main	TRUE	225	279	279	150	150	150	165	18310: J-3888	TRUE
369723	479: Zone-Main	TRUE	100	283	283	150	156	150	150	16598: J-3795	TRUE
369727	479: Zone-Main	TRUE	100	280	281	150	155	150	150	16598: J-3795	TRUE
370154	479: Zone-Main	TRUE	100	181	181	150	150	150	154	14065: J-3122	TRUE
370405	479: Zone-Main	TRUE	100	197	197	150	152	150	150	6731: 370154	TRUE
377282	479: Zone-Main	TRUE	No Hydrant	204	204	150	150	150	249	6834: 377340	TRUE
377338	479: Zone-Main	TRUE	225	278	278	150	155	150	150	6834: 377340	TRUE
377340	479: Zone-Main	FALSE	225	204	204	150	150	150	176	6841: 377460	TRUE
377460	479: Zone-Main	TRUE	No Hydrant	212	212	150	160	150	150	6834: 377340	TRUE
377669	479: Zone-Main	TRUE	No Hydrant	282	282	150	150	150	156	16598: J-3795	TRUE
377798	479: Zone-Main	TRUE	No Hydrant	278	278	150	168	150	150	6834: 377340	TRUE
379439	479: Zone-Main	TRUE	100	286	286	150	150	150	152	16598: J-3795	TRUE
379449	479: Zone-Main	TRUE	100	284	284	150	158	150	150	16598: J-3795	TRUE
380208	479: Zone-Main	TRUE	100	285	285	150	153	150	150	16598: J-3795	TRUE
381224	479: Zone-Main	TRUE	100	287	288	150	150	150	150	16598: J-3795	TRUE

Table C2: Existing System Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
390267	479: Zone-Main	FALSE	225	78	78	150	150	150	212	16288: J-3708	TRUE
390344	479: Zone-Main	FALSE	225	79	79	150	150	150	202	7007: 390267	TRUE
393420	479: Zone-Main	TRUE	No Hydrant	157	157	150	153	150	150	6014: 3891	TRUE
393471	479: Zone-Main	FALSE	225	149	150	150	153	150	150	7023: 393523	TRUE
393483	479: Zone-Main	FALSE	225	139	140	150	150	150	173	7023: 393523	TRUE
393523	479: Zone-Main	TRUE	No Hydrant	143	143	150	150	150	150	6014: 3891	TRUE
398098	479: Zone-Main	TRUE	185	231	231	150	183	150	150	18345: J-3904	TRUE
398161	479: Zone-Main	TRUE	No Hydrant	261	261	150	186	150	150	6014: 3891	TRUE
398225	479: Zone-Main	TRUE	185	247	248	150	183	150	150	18345: J-3904	TRUE
398555	479: Zone-Main	TRUE	185	214	214	150	155	150	150	12363: J-2419	TRUE
398639	479: Zone-Main	TRUE	185	223	223	150	153	150	150	18345: J-3904	TRUE
398721	479: Zone-Main	TRUE	100	221	221	150	171	150	150	6014: 3891	TRUE
398794	479: Zone-Main	TRUE	100	211	212	150	150	150	174	6014: 3891	TRUE
399184	479: Zone-Main	TRUE	100	218	218	150	153	150	150	6014: 3891	TRUE
399697	479: Zone-Main	TRUE	100	211	211	150	150	150	167	6014: 3891	TRUE
399781	479: Zone-Main	TRUE	100	216	216	150	152	150	150	6014: 3891	TRUE
399812	479: Zone-Main	TRUE	185	213	214	150	164	150	150	18345: J-3904	TRUE
399839	479: Zone-Main	TRUE	No Hydrant	211	211	150	167	150	150	6014: 3891	TRUE
HYD_113	479: Zone-Main	TRUE	No Hydrant	111	111	150	150	150	157	3244: J-2382	TRUE
HYD_114	479: Zone-Main	TRUE	No Hydrant	102	102	150	150	150	165	2997: J-2324	TRUE
HYD_208	479: Zone-Main	TRUE	100	275	275	150	150	150	190	6014: 3891	TRUE
HYD_226	479: Zone-Main	TRUE	No Hydrant	155	155	150	150	150	332	6014: 3891	TRUE
HYD_262	479: Zone-Main	TRUE	100	252	252	150	150	150	284	6014: 3891	TRUE
HYD_275	479: Zone-Main	FALSE	225	180	180	150	150	150	172	7023: 393523	TRUE
HYD_279	479: Zone-Main	TRUE	No Hydrant	210	210	150	150	150	285	6014: 3891	TRUE
HYD_303	479: Zone-Main	TRUE	No Hydrant	175	175	150	150	150	232	6014: 3891	TRUE
HYD_304	479: Zone-Main	TRUE	No Hydrant	175	175	150	152	150	150	6014: 3891	TRUE
HYD_305	479: Zone-Main	TRUE	No Hydrant	265	265	150	150	150	196	6014: 3891	TRUE
HYD_306	479: Zone-Main	TRUE	No Hydrant	216	216	150	150	150	270	6014: 3891	TRUE
HYD_35	479: Zone-Main	FALSE	225	136	136	150	150	150	158	16646: J-3815	TRUE
HYD_410P	479: Zone-Main	TRUE	No Hydrant	216	216	150	150	150	150	6014: 3891	TRUE
HYD_411	479: Zone-Main	TRUE	No Hydrant	244	244	150	150	150	198	6014: 3891	TRUE
HYD_434	479: Zone-Main	TRUE	100	205	205	150	150	150	302	6014: 3891	TRUE
HYD_435	479: Zone-Main	TRUE	No Hydrant	300	300	150	342	150	324	6014: 3891	TRUE
HYD_44	479: Zone-Main	TRUE	No Hydrant	300	300	150	474	150	358	6014: 3891	TRUE
HYD_45	479: Zone-Main	TRUE	No Hydrant	193	193	150	150	150	258	6014: 3891	TRUE
HYD_495	479: Zone-Main	TRUE	No Hydrant	300	300	150	256	150	192	6014: 3891	TRUE
HYD_542	479: Zone-Main	TRUE	No Hydrant	300	300	150	256	150	190	6014: 3891	TRUE
HYD_602	479: Zone-Main	TRUE	No Hydrant	300	300	150	294	150	284	6014: 3891	TRUE
HYD_625	479: Zone-Main	TRUE	No Hydrant	300	300	150	187	150	227	6014: 3891	TRUE
HYD_627	479: Zone-Main	TRUE	No Hydrant	267	267	150	150	150	157	6014: 3891	TRUE
HYD_727	479: Zone-Main	TRUE	No Hydrant	167	167	150	158	150	150	6014: 3891	TRUE
HYD_728	479: Zone-Main	TRUE	185	203	203	150	158	150	150	1057: J-1878	TRUE
HYD_766	479: Zone-Main	TRUE	No Hydrant	300	300	150	340	150	196	6014: 3891	TRUE
HYD_808	479: Zone-Main	TRUE	No Hydrant	300	300	150	263	150	277	6014: 3891	TRUE
HYD_830	479: Zone-Main	TRUE	No Hydrant	210	210	150	150	150	150	6014: 3891	TRUE
HYD_84	479: Zone-Main	TRUE	No Hydrant	66	66	150	152	150	150	3220: J-2374	TRUE
HYD_85	479: Zone-Main	TRUE	No Hydrant	50	50	150	150	150	151	2351: J-2113	TRUE
HYD_9	479: Zone-Main	TRUE	No Hydrant	271	271	150	150	150	302	6014: 3891	TRUE
J-10	479: Zone-Main	TRUE	225	300	301	150	605	150	383	6014: 3891	TRUE
J-100	479: Zone-Main	TRUE	225	300	300	150	240	150	290	603: J-101	TRUE
J-101	479: Zone-Main	TRUE	225	300	300	150	246	150	273	856: J-1440	TRUE
J-102	479: Zone-Main	TRUE	100	300	300	150	273	150	287	6014: 3891	TRUE
J-103	479: Zone-Main	TRUE	No Hydrant	300	300	150	361	150	340	6014: 3891	TRUE
J-104	479: Zone-Main	TRUE	225	272	272	150	150	150	196	3307: J-2403	TRUE
J-105	479: Zone-Main	TRUE	225	272	272	150	150	150	177	758: J-1216	TRUE
J-106	479: Zone-Main	TRUE	225	261	263	150	150	150	236	799: J-1300	TRUE
J-107	479: Zone-Main	TRUE	185	293	293	150	150	150	263	793: J-1288	TRUE
J-108	479: Zone-Main	TRUE	225	247	247	150	150	150	194	3262: J-2388	TRUE
J-109	479: Zone-Main	TRUE	225	300	301	150	220	150	304	6192: 116421	TRUE
J-11	479: Zone-Main	TRUE	No Hydrant	300	300	150	562	150	383	6014: 3891	TRUE
J-110	479: Zone-Main	TRUE	100	300	300	150	275	150	300	6014: 3891	TRUE
J-1100	479: Zone-Main	TRUE	225	300	300	150	259	150	196	6834: 377340	TRUE
J-1102	479: Zone-Main	TRUE	225	300	300	150	256	150	193	6834: 377340	TRUE
J-1104	479: Zone-Main	TRUE	225	301	301	150	261	150	179	6834: 377340	TRUE
J-1106	479: Zone-Main	TRUE	225	270	271	150	150	150	214	6834: 377340	TRUE
J-1108	479: Zone-Main	FALSE	225	118	119	150	164	150	246	672: J-65	TRUE
J-111	479: Zone-Main	TRUE	100	300	300	150	299	150	302	6014: 3891	TRUE
J-1110	479: Zone-Main	TRUE	100	300	300	150	333	150	318	6014: 3891	TRUE
J-1112	479: Zone-Main	TRUE	No Hydrant	300	300	150	345	150	316	6014: 3891	TRUE
J-1114	479: Zone-Main	TRUE	100	300	300	150	228	150	229	6014: 3891	TRUE
J-1116	479: Zone-Main	TRUE	100	299	299	150	150	150	180	6014: 3891	TRUE
J-1118	479: Zone-Main	TRUE	100	279	279	150	150	150	223	6014: 3891	TRUE
J-112	479: Zone-Main	TRUE	100	300	301	150	300	150	317	6014: 3891	TRUE
J-1120	479: Zone-Main	TRUE	100	281	281	150	150	150	165	6014: 3891	TRUE
J-1122	479: Zone-Main	TRUE	100	231	231	150	150	150	235	6014: 3891	TRUE
J-1124	479: Zone-Main	TRUE	100	242	242	150	150	150	208	716: J-1122	TRUE
J-1126	479: Zone-Main	TRUE	100	291	292	150	150	150	161	6014: 3891	TRUE
J-1128	479: Zone-Main	TRUE	100	294	294	150	155	150	150	6014: 3891	TRUE
J-113	479: Zone-Main	TRUE	225	300	300	150	300	150	324	2393: J-2128	TRUE
J-1130	479: Zone-Main	TRUE	100	300	300	150	236	150	233	6014: 3891	TRUE
J-1132	479: Zone-Main	TRUE	100	300	300	150	354	150	316	6014: 3891	TRUE
J-1134	479: Zone-Main	TRUE	100	292	292	150	150	150	258	6014: 3891	TRUE
J-1136	479: Zone-Main	TRUE	100	199	199	150	150	150	287	6014: 3891	TRUE
J-1138	479: Zone-Main	TRUE	100	220	220	150	150	150	315	6014: 3891	TRUE
J-114	479: Zone-Main	TRUE	225	300	300	150	328	150	323	2393: J-2128	TRUE
J-1140	479: Zone-Main	TRUE	No Hydrant	300	300	150	360	150	316	6014: 3891	TRUE
J-1142	479: Zone-Main	TRUE	No Hydrant	300	300	150	361	150	320	6014: 3891	TRUE
J-1146	479: Zone-Main	TRUE	225	277	277	150	150	150	317	6014: 3891	TRUE
J-1148	479: Zone-Main	TRUE	100	300	300	150	240	150	289	6014: 3891	TRUE

Table C2: Existing System Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-115	479: Zone-Main	TRUE	225	300	300	150	340	150	322	2393: J-2128	TRUE
J-1150	479: Zone-Main	TRUE	100	300	300	150	376	150	326	6014: 3891	TRUE
J-1152	479: Zone-Main	TRUE	100	300	300	150	220	150	237	6014: 3891	TRUE
J-1154	479: Zone-Main	TRUE	100	300	300	150	285	150	283	6014: 3891	TRUE
J-1156	479: Zone-Main	TRUE	100	283	284	150	150	150	261	6014: 3891	TRUE
J-1158	479: Zone-Main	TRUE	100	300	300	150	153	150	224	6014: 3891	TRUE
J-116	479: Zone-Main	TRUE	225	300	300	150	342	150	322	2393: J-2128	TRUE
J-1160	479: Zone-Main	TRUE	No Hydrant	300	300	150	368	150	323	6014: 3891	TRUE
J-1162	479: Zone-Main	TRUE	100	185	185	150	158	150	374	6014: 3891	TRUE
J-1164	479: Zone-Main	TRUE	No Hydrant	300	300	150	288	150	302	6014: 3891	TRUE
J-1168	479: Zone-Main	TRUE	100	300	301	150	273	150	285	6014: 3891	TRUE
J-117	479: Zone-Main	TRUE	No Hydrant	300	300	150	287	150	281	6014: 3891	TRUE
J-1170	479: Zone-Main	TRUE	100	261	261	150	150	150	219	6014: 3891	TRUE
J-1172	479: Zone-Main	TRUE	100	300	300	150	247	150	276	6014: 3891	TRUE
J-1174	479: Zone-Main	TRUE	100	269	270	150	150	150	202	6014: 3891	TRUE
J-1176	479: Zone-Main	TRUE	225	300	301	150	265	150	276	743: J-1180	TRUE
J-1178	479: Zone-Main	TRUE	100	300	300	150	249	150	272	6014: 3891	TRUE
J-118	479: Zone-Main	TRUE	100	300	300	150	339	150	323	6014: 3891	TRUE
J-1180	479: Zone-Main	TRUE	225	300	300	150	211	150	238	6228: 121664	TRUE
J-1182	479: Zone-Main	TRUE	100	131	131	150	165	150	155	2405: J-2133	TRUE
J-1184	479: Zone-Main	TRUE	100	122	122	150	163	150	159	16442: J-3730	TRUE
J-119	479: Zone-Main	TRUE	100	300	300	150	343	150	324	6014: 3891	TRUE
J-1190	479: Zone-Main	TRUE	225	300	302	150	330	150	318	6014: 3891	TRUE
J-1192	479: Zone-Main	TRUE	185	300	300	150	330	150	316	6014: 3891	TRUE
J-1194	479: Zone-Main	TRUE	225	300	301	150	186	150	177	6090: 6363	TRUE
J-1196	479: Zone-Main	TRUE	No Hydrant	300	300	150	330	150	319	6014: 3891	TRUE
J-1198	479: Zone-Main	TRUE	No Hydrant	300	300	150	384	150	330	6014: 3891	TRUE
J-12	479: Zone-Main	TRUE	No Hydrant	300	300	150	560	150	384	6014: 3891	TRUE
J-120	479: Zone-Main	TRUE	No Hydrant	300	300	150	220	150	298	6014: 3891	TRUE
J-1200	479: Zone-Main	TRUE	No Hydrant	300	300	150	391	150	338	6014: 3891	TRUE
J-1202	479: Zone-Main	TRUE	100	300	300	150	306	150	316	6014: 3891	TRUE
J-1204	479: Zone-Main	TRUE	100	300	300	150	242	150	256	6014: 3891	TRUE
J-1206	479: Zone-Main	TRUE	225	300	301	150	254	150	289	6192: 116421	TRUE
J-121	479: Zone-Main	TRUE	100	300	300	150	189	150	222	6014: 3891	TRUE
J-1210	479: Zone-Main	TRUE	100	243	243	150	150	150	245	6014: 3891	TRUE
J-1212	479: Zone-Main	TRUE	100	253	253	150	150	150	204	6014: 3891	TRUE
J-1214	479: Zone-Main	TRUE	225	240	241	150	150	150	212	3271: J-2391	TRUE
J-1216	479: Zone-Main	TRUE	No Hydrant	153	153	150	167	150	376	6014: 3891	TRUE
J-1218	479: Zone-Main	FALSE	225	158	158	150	150	150	345	803: J-1308	TRUE
J-122	479: Zone-Main	TRUE	No Hydrant	300	300	150	337	150	324	6014: 3891	TRUE
J-1220	479: Zone-Main	TRUE	225	229	229	150	150	150	289	3307: J-2403	TRUE
J-1222	479: Zone-Main	FALSE	225	195	196	150	150	150	177	18266: J-3881	TRUE
J-1224	479: Zone-Main	FALSE	185	175	175	150	159	150	150	16458: J-3737	TRUE
J-1226	479: Zone-Main	TRUE	225	300	301	150	177	150	194	2407: J-2134	TRUE
J-1228	479: Zone-Main	FALSE	225	224	224	150	150	150	254	790: J-1282	TRUE
J-123	479: Zone-Main	TRUE	No Hydrant	300	300	150	269	150	301	6014: 3891	TRUE
J-1230	479: Zone-Main	TRUE	185	300	301	150	210	150	262	6014: 3891	TRUE
J-1232	479: Zone-Main	TRUE	100	300	300	150	227	150	319	6014: 3891	TRUE
J-1234	479: Zone-Main	TRUE	100	300	301	150	270	150	341	6014: 3891	TRUE
J-1236	479: Zone-Main	TRUE	No Hydrant	275	275	150	150	150	257	6014: 3891	TRUE
J-1238	479: Zone-Main	TRUE	No Hydrant	257	257	150	150	150	158	6014: 3891	TRUE
J-124	479: Zone-Main	TRUE	No Hydrant	300	300	150	329	150	327	6014: 3891	TRUE
J-1240	479: Zone-Main	FALSE	225	206	207	150	155	150	150	3211: J-2371	TRUE
J-1242	479: Zone-Main	TRUE	No Hydrant	220	220	150	154	150	150	6014: 3891	TRUE
J-1244	479: Zone-Main	TRUE	225	241	242	150	150	150	219	769: J-1238	TRUE
J-1246	479: Zone-Main	FALSE	225	184	184	150	150	150	215	3217: J-2373	TRUE
J-1248	479: Zone-Main	TRUE	185	300	300	150	361	150	348	6014: 3891	TRUE
J-125	479: Zone-Main	TRUE	No Hydrant	192	192	150	150	150	325	6014: 3891	TRUE
J-1250	479: Zone-Main	TRUE	185	300	300	150	356	150	341	6014: 3891	TRUE
J-1252	479: Zone-Main	TRUE	225	300	301	150	181	150	355	6014: 3891	TRUE
J-1254	479: Zone-Main	TRUE	185	300	300	150	321	150	320	6014: 3891	TRUE
J-1256	479: Zone-Main	FALSE	225	204	205	150	150	150	321	3337: J-2413	TRUE
J-1258	479: Zone-Main	TRUE	185	300	301	150	318	150	324	6014: 3891	TRUE
J-1260	479: Zone-Main	TRUE	225	300	300	150	344	150	359	6014: 3891	TRUE
J-1262	479: Zone-Main	TRUE	No Hydrant	300	300	150	425	150	355	6014: 3891	TRUE
J-1264	479: Zone-Main	TRUE	225	300	300	150	437	150	351	6014: 3891	TRUE
J-1266	479: Zone-Main	TRUE	225	300	300	150	225	150	288	6834: 377340	TRUE
J-1268	479: Zone-Main	FALSE	225	223	224	150	150	150	208	18041: HYD_35	TRUE
J-127	479: Zone-Main	TRUE	225	300	300	150	210	150	289	6014: 3891	TRUE
J-1270	479: Zone-Main	TRUE	185	300	301	150	355	150	352	6014: 3891	TRUE
J-1272	479: Zone-Main	TRUE	100	149	149	150	150	150	304	6014: 3891	TRUE
J-1276	479: Zone-Main	TRUE	185	225	225	150	150	150	303	3192: J-2364	TRUE
J-1278	479: Zone-Main	TRUE	225	300	300	150	370	150	355	6014: 3891	TRUE
J-128	479: Zone-Main	FALSE	225	200	201	150	150	150	152	16382: J-3719	TRUE
J-1280	479: Zone-Main	TRUE	100	165	165	150	150	150	298	6014: 3891	TRUE
J-1282	479: Zone-Main	TRUE	100	153	154	150	150	150	206	3319: J-2407	TRUE
J-1284	479: Zone-Main	TRUE	100	165	165	150	150	150	289	6014: 3891	TRUE
J-1286	479: Zone-Main	TRUE	100	300	300	150	229	150	268	6014: 3891	TRUE
J-1288	479: Zone-Main	TRUE	225	254	254	150	150	150	237	599: J-108	TRUE
J-129	479: Zone-Main	FALSE	225	200	201	150	150	150	160	16382: J-3719	TRUE
J-1290	479: Zone-Main	TRUE	185	229	230	150	150	150	192	800: J-1302	TRUE
J-1292	479: Zone-Main	TRUE	100	176	176	150	150	150	305	6014: 3891	TRUE
J-1294	479: Zone-Main	TRUE	100	162	162	150	150	150	285	6014: 3891	TRUE
J-1296	479: Zone-Main	TRUE	225	236	236	150	150	150	271	796: J-1294	TRUE
J-1298	479: Zone-Main	TRUE	100	177	179	150	150	150	230	3295: J-2399	TRUE
J-13	479: Zone-Main	TRUE	No Hydrant	300	300	150	493	150	384	6014: 3891	TRUE
J-130	479: Zone-Main	TRUE	No Hydrant	168	168	150	150	150	285	6014: 3891	TRUE
J-1300	479: Zone-Main	TRUE	185	186	187	150	150	150	196	3274: J-2392	TRUE
J-1302	479: Zone-Main	TRUE	185	197	197	150	150	150	195	3274: J-2392	TRUE
J-1304	479: Zone-Main	TRUE	100	248	248	150	150	150	207	6014: 3891	TRUE

Table C2: Existing System Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-1306	479: Zone-Main	TRUE	100	300	300	150	233	150	257	6014: 3891	TRUE
J-1308	479: Zone-Main	TRUE	100	179	179	150	150	150	228	6014: 3891	TRUE
J-1310	479: Zone-Main	FALSE	225	211	212	150	150	150	157	15905: J-3659	TRUE
J-1310	479: Zone-Main	TRUE	No Hydrant	300	300	150	280	150	275	6014: 3891	TRUE
J-1312	479: Zone-Main	TRUE	225	300	300	150	330	150	321	2393: J-2128	TRUE
J-132	479: Zone-Main	FALSE	225	216	216	150	150	150	154	18020: HYD_410P	TRUE
J-133	479: Zone-Main	TRUE	225	300	300	150	220	150	228	6014: 3891	TRUE
J-1338	479: Zone-Main	TRUE	100	300	300	150	262	150	277	6014: 3891	TRUE
J-134	479: Zone-Main	TRUE	No Hydrant	300	300	150	284	150	328	6014: 3891	TRUE
J-1340	479: Zone-Main	TRUE	100	300	301	150	209	150	264	6014: 3891	TRUE
J-1342	479: Zone-Main	TRUE	100	300	300	150	222	150	262	6014: 3891	TRUE
J-1344	479: Zone-Main	TRUE	100	300	300	150	258	150	237	2393: J-2128	TRUE
J-1348	479: Zone-Main	TRUE	100	300	300	150	212	150	189	2393: J-2128	TRUE
J-135	479: Zone-Main	TRUE	No Hydrant	300	300	150	359	150	340	6014: 3891	TRUE
J-1350	479: Zone-Main	TRUE	100	300	300	150	195	150	186	2393: J-2128	TRUE
J-1352	479: Zone-Main	TRUE	100	300	300	150	191	150	179	2393: J-2128	TRUE
J-1354	479: Zone-Main	TRUE	100	214	215	150	150	150	153	2393: J-2128	TRUE
J-1356	479: Zone-Main	TRUE	100	236	237	150	150	150	207	2393: J-2128	TRUE
J-1358	479: Zone-Main	TRUE	100	300	301	150	189	150	218	6014: 3891	TRUE
J-136	479: Zone-Main	TRUE	185	300	300	150	357	150	350	6014: 3891	TRUE
J-1360	479: Zone-Main	TRUE	100	300	300	150	236	150	263	6014: 3891	TRUE
J-1366	479: Zone-Main	TRUE	100	300	300	150	319	150	311	6014: 3891	TRUE
J-1368	479: Zone-Main	TRUE	100	300	300	150	316	150	308	6014: 3891	TRUE
J-137	479: Zone-Main	TRUE	185	300	300	150	340	150	337	6014: 3891	TRUE
J-1372	479: Zone-Main	TRUE	225	300	300	150	349	150	310	6014: 3891	TRUE
J-1374	479: Zone-Main	TRUE	No Hydrant	300	300	150	278	150	310	6014: 3891	TRUE
J-1376	479: Zone-Main	TRUE	225	300	300	150	280	150	280	6014: 3891	TRUE
J-1378	479: Zone-Main	TRUE	100	300	301	150	191	150	264	6014: 3891	TRUE
J-138	479: Zone-Main	FALSE	225	132	133	150	150	150	390	18461: J-3933	TRUE
J-1380	479: Zone-Main	TRUE	100	300	300	150	206	150	253	6014: 3891	TRUE
J-1382	479: Zone-Main	TRUE	No Hydrant	300	300	150	331	150	318	6014: 3891	TRUE
J-1384	479: Zone-Main	TRUE	185	300	300	150	302	150	308	6014: 3891	TRUE
J-1386	479: Zone-Main	TRUE	100	300	300	150	268	150	275	6014: 3891	TRUE
J-1388	479: Zone-Main	TRUE	100	300	300	150	336	150	317	6014: 3891	TRUE
J-139	479: Zone-Main	TRUE	No Hydrant	300	300	150	336	150	333	6014: 3891	TRUE
J-1390	479: Zone-Main	TRUE	185	300	300	150	255	150	290	6014: 3891	TRUE
J-1392	479: Zone-Main	TRUE	225	300	301	150	335	150	314	6014: 3891	TRUE
J-1394	479: Zone-Main	FALSE	225	140	140	150	150	150	259	858: J-1444	TRUE
J-1396	479: Zone-Main	TRUE	100	300	300	150	223	150	229	6014: 3891	TRUE
J-1398	479: Zone-Main	TRUE	185	300	300	150	305	150	262	6192: 116421	TRUE
J-14	479: Zone-Main	TRUE	225	300	300	150	491	150	358	6014: 3891	TRUE
J-140	479: Zone-Main	TRUE	No Hydrant	300	300	150	336	150	340	6014: 3891	TRUE
J-1400	479: Zone-Main	TRUE	225	300	302	150	309	150	271	6192: 116421	TRUE
J-1402	479: Zone-Main	TRUE	No Hydrant	300	300	150	304	150	286	6014: 3891	TRUE
J-1404	479: Zone-Main	TRUE	100	277	277	150	150	150	200	6014: 3891	TRUE
J-1406	479: Zone-Main	TRUE	100	300	300	150	169	150	199	6014: 3891	TRUE
J-1408	479: Zone-Main	TRUE	100	226	227	150	150	150	150	6014: 3891	TRUE
J-141	479: Zone-Main	TRUE	225	300	301	150	354	150	325	6014: 3891	TRUE
J-1410	479: Zone-Main	TRUE	185	300	300	150	186	150	223	6014: 3891	TRUE
J-1412	479: Zone-Main	TRUE	100	290	290	150	150	150	241	6014: 3891	TRUE
J-1414	479: Zone-Main	TRUE	100	300	300	150	341	150	305	6014: 3891	TRUE
J-1416	479: Zone-Main	TRUE	100	218	218	150	150	150	274	6014: 3891	TRUE
J-1418	479: Zone-Main	TRUE	No Hydrant	243	243	150	150	150	310	6014: 3891	TRUE
J-142	479: Zone-Main	TRUE	No Hydrant	300	300	150	358	150	318	6014: 3891	TRUE
J-1420	479: Zone-Main	TRUE	100	224	225	150	150	150	228	6014: 3891	TRUE
J-1422	479: Zone-Main	TRUE	185	300	301	150	236	150	236	2199: J-2052	TRUE
J-1424	479: Zone-Main	TRUE	225	300	300	150	335	150	305	6014: 3891	TRUE
J-1426	479: Zone-Main	TRUE	100	175	176	150	150	150	370	6014: 3891	TRUE
J-1428	479: Zone-Main	TRUE	100	300	300	150	282	150	257	2393: J-2128	TRUE
J-143	479: Zone-Main	TRUE	No Hydrant	259	259	150	150	150	292	6014: 3891	TRUE
J-1430	479: Zone-Main	TRUE	100	265	265	150	150	150	162	6014: 3891	TRUE
J-1432	479: Zone-Main	TRUE	100	300	300	150	333	150	325	6014: 3891	TRUE
J-1434	479: Zone-Main	TRUE	100	134	135	150	150	150	158	3262: J-2388	TRUE
J-1436	479: Zone-Main	TRUE	100	122	122	150	150	150	179	3262: J-2388	TRUE
J-1438	479: Zone-Main	TRUE	No Hydrant	300	300	150	252	150	287	6014: 3891	TRUE
J-144	479: Zone-Main	TRUE	100	300	300	150	218	150	265	6014: 3891	TRUE
J-1440	479: Zone-Main	TRUE	100	300	300	150	222	150	261	6014: 3891	TRUE
J-1442	479: Zone-Main	TRUE	100	204	204	150	150	150	203	6014: 3891	TRUE
J-1444	479: Zone-Main	FALSE	225	184	185	150	158	150	161	19196: J-4067	TRUE
J-1446	479: Zone-Main	TRUE	225	300	300	150	163	150	189	3316: J-2406	TRUE
J-1448	479: Zone-Main	TRUE	185	300	300	150	178	150	230	859: J-1446	TRUE
J-145	479: Zone-Main	TRUE	No Hydrant	300	300	150	176	150	199	6014: 3891	TRUE
J-1450	479: Zone-Main	TRUE	185	300	300	150	260	150	261	6014: 3891	TRUE
J-1452	479: Zone-Main	TRUE	185	264	264	150	150	150	314	6014: 3891	TRUE
J-1454	479: Zone-Main	TRUE	100	269	269	150	150	150	202	6014: 3891	TRUE
J-1456	479: Zone-Main	TRUE	100	283	283	150	150	150	164	6014: 3891	TRUE
J-1458	479: Zone-Main	TRUE	No Hydrant	228	228	150	155	150	150	6014: 3891	TRUE
J-146	479: Zone-Main	TRUE	No Hydrant	271	271	150	150	150	269	6014: 3891	TRUE
J-1460	479: Zone-Main	TRUE	No Hydrant	300	300	150	377	150	359	6014: 3891	TRUE
J-1462	479: Zone-Main	FALSE	225	193	193	150	150	150	156	2356: J-2115	TRUE
J-1464	479: Zone-Main	TRUE	100	184	184	150	155	150	150	6014: 3891	TRUE
J-1466	479: Zone-Main	TRUE	100	133	134	150	150	150	169	870: J-1468	TRUE
J-1468	479: Zone-Main	TRUE	100	131	131	150	150	150	232	869: J-1466	TRUE
J-147	479: Zone-Main	TRUE	185	280	280	150	150	150	195	6014: 3891	TRUE
J-1470	479: Zone-Main	TRUE	100	185	185	150	150	150	198	6014: 3891	TRUE
J-1472	479: Zone-Main	TRUE	100	178	178	150	150	150	178	6014: 3891	TRUE
J-1474	479: Zone-Main	TRUE	No Hydrant	285	285	150	150	150	221	6014: 3891	TRUE
J-1476	479: Zone-Main	TRUE	100	136	136	150	154	150	150	16444: J-3731	TRUE
J-1478	479: Zone-Main	TRUE	No Hydrant	300	300	150	193	150	225	6014: 3891	TRUE
J-148	479: Zone-Main	TRUE	225	252	252	150	150	150	245	2281: J-2089	TRUE

Table C2: Existing System Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-1480	479: Zone-Main	TRUE	100	300	300	150	150	150	150	6014: 3891	TRUE
J-1482	479: Zone-Main	TRUE	100	300	300	150	244	150	275	6014: 3891	TRUE
J-1484	479: Zone-Main	TRUE	100	300	300	150	201	150	196	6014: 3891	TRUE
J-1486	479: Zone-Main	TRUE	100	300	300	150	210	150	205	6014: 3891	TRUE
J-1488	479: Zone-Main	TRUE	No Hydrant	300	300	150	250	150	278	6014: 3891	TRUE
J-149	479: Zone-Main	TRUE	185	300	301	150	153	150	214	6014: 3891	TRUE
J-1490	479: Zone-Main	TRUE	100	291	291	150	150	150	156	6014: 3891	TRUE
J-1492	479: Zone-Main	TRUE	100	168	168	150	158	150	150	6014: 3891	TRUE
J-1494	479: Zone-Main	TRUE	100	133	133	150	165	150	150	16479: J-3747	TRUE
J-1496	479: Zone-Main	TRUE	100	141	141	150	164	150	162	16477: J-3746	TRUE
J-1498	479: Zone-Main	TRUE	100	258	258	150	150	150	191	6014: 3891	TRUE
J-15	479: Zone-Main	TRUE	No Hydrant	300	300	150	453	150	358	6014: 3891	TRUE
J-150	479: Zone-Main	TRUE	No Hydrant	294	294	150	150	150	233	6014: 3891	TRUE
J-1500	479: Zone-Main	TRUE	100	169	170	150	150	150	342	6014: 3891	TRUE
J-1502	479: Zone-Main	TRUE	No Hydrant	300	300	150	224	150	240	6014: 3891	TRUE
J-1504	479: Zone-Main	TRUE	No Hydrant	300	300	150	361	150	354	6014: 3891	TRUE
J-1506	479: Zone-Main	TRUE	225	300	301	150	289	150	333	6014: 3891	TRUE
J-1508	479: Zone-Main	TRUE	225	300	300	150	246	150	271	16643: J-3814	TRUE
J-151	479: Zone-Main	TRUE	100	250	250	150	150	150	245	6014: 3891	TRUE
J-1510	479: Zone-Main	TRUE	100	234	234	150	150	150	191	6014: 3891	TRUE
J-1512	479: Zone-Main	TRUE	100	235	235	150	150	150	175	6014: 3891	TRUE
J-1514	479: Zone-Main	TRUE	100	155	155	150	150	150	224	3298: J-2400	TRUE
J-1516	479: Zone-Main	TRUE	100	170	170	150	150	150	185	3298: J-2400	TRUE
J-1518	479: Zone-Main	TRUE	100	300	300	150	311	150	323	6014: 3891	TRUE
J-152	479: Zone-Main	TRUE	225	267	267	150	150	150	157	577: J-155	TRUE
J-1520	479: Zone-Main	TRUE	185	300	301	150	270	150	321	6014: 3891	TRUE
J-1522	479: Zone-Main	TRUE	100	180	181	150	150	150	357	6014: 3891	TRUE
J-1524	479: Zone-Main	TRUE	100	300	300	150	316	150	329	6014: 3891	TRUE
J-1526	479: Zone-Main	TRUE	225	271	271	150	150	150	355	6014: 3891	TRUE
J-1528	479: Zone-Main	TRUE	225	300	300	150	209	150	155	6834: 377340	TRUE
J-153	479: Zone-Main	TRUE	100	260	260	150	150	150	198	6014: 3891	TRUE
J-1530	479: Zone-Main	TRUE	No Hydrant	300	300	150	234	150	268	6014: 3891	TRUE
J-1532	479: Zone-Main	TRUE	225	300	300	150	314	150	304	499: J-322	TRUE
J-1534	479: Zone-Main	TRUE	225	300	302	150	281	150	292	16288: J-3708	TRUE
J-1536	479: Zone-Main	FALSE	225	91	91	150	150	150	155	7011: 390344	TRUE
J-1538	479: Zone-Main	TRUE	No Hydrant	99	99	150	150	150	277	16288: J-3708	TRUE
J-154	479: Zone-Main	TRUE	100	250	250	150	150	150	205	6014: 3891	TRUE
J-155	479: Zone-Main	TRUE	No Hydrant	268	268	150	150	150	152	6014: 3891	TRUE
J-156	479: Zone-Main	TRUE	100	262	262	150	150	150	204	6014: 3891	TRUE
J-157	479: Zone-Main	TRUE	100	234	234	150	150	150	150	6014: 3891	TRUE
J-158	479: Zone-Main	FALSE	225	167	167	150	154	150	150	2405: J-2133	TRUE
J-1584	479: Zone-Main	TRUE	225	300	302	150	295	150	163	18310: J-3888	TRUE
J-159	479: Zone-Main	TRUE	100	240	241	150	150	150	182	6014: 3891	TRUE
J-16	479: Zone-Main	TRUE	No Hydrant	300	300	150	455	150	358	6014: 3891	TRUE
J-160	479: Zone-Main	TRUE	No Hydrant	217	217	150	150	150	157	6014: 3891	TRUE
J-161	479: Zone-Main	TRUE	100	207	207	150	150	150	190	857: J-1442	TRUE
J-1628	479: Zone-Main	TRUE	225	300	302	150	256	150	182	18310: J-3888	TRUE
J-1632	479: Zone-Main	TRUE	No Hydrant	287	287	150	251	150	150	6014: 3891	TRUE
J-1656	479: Zone-Main	TRUE	No Hydrant	277	277	150	153	150	150	6090: 6363	TRUE
J-168	479: Zone-Main	TRUE	225	300	301	150	195	150	322	6014: 3891	TRUE
J-169	479: Zone-Main	TRUE	No Hydrant	300	300	150	332	150	190	6014: 3891	TRUE
J-17	479: Zone-Main	TRUE	225	300	301	150	338	150	357	6014: 3891	TRUE
J-170	479: Zone-Main	TRUE	225	300	302	150	290	150	174	18310: J-3888	TRUE
J-1750	479: Zone-Main	TRUE	No Hydrant	207	207	150	150	150	200	6014: 3891	TRUE
J-1798	479: Zone-Main	TRUE	No Hydrant	247	247	150	154	150	150	858: J-1444	TRUE
J-18	479: Zone-Main	TRUE	225	244	244	150	150	150	240	18029: HYD_113	TRUE
J-182	479: Zone-Main	FALSE	225	214	215	150	150	150	278	640: J-128	TRUE
J-184	479: Zone-Main	TRUE	No Hydrant	300	300	150	354	150	343	6014: 3891	TRUE
J-185	479: Zone-Main	TRUE	No Hydrant	198	198	150	150	150	265	6014: 3891	TRUE
J-186	479: Zone-Main	TRUE	No Hydrant	300	300	150	330	150	325	6014: 3891	TRUE
J-1866	479: Zone-Main	TRUE	100	200	200	150	160	150	150	6014: 3891	TRUE
J-1868	479: Zone-Main	TRUE	100	163	163	150	157	150	150	1057: J-1878	TRUE
J-1878	479: Zone-Main	TRUE	100	149	149	150	163	150	232	1056: J-1868	TRUE
J-188	479: Zone-Main	TRUE	No Hydrant	300	300	150	235	150	222	6014: 3891	TRUE
J-1880	479: Zone-Main	TRUE	No Hydrant	111	111	150	150	150	157	6014: 3891	TRUE
J-19	479: Zone-Main	TRUE	No Hydrant	231	231	150	150	150	157	6014: 3891	TRUE
J-1900	479: Zone-Main	TRUE	100	300	300	150	287	150	276	6014: 3891	TRUE
J-1902	479: Zone-Main	TRUE	185	300	300	150	227	150	246	6192: 116421	TRUE
J-1904	479: Zone-Main	TRUE	185	249	250	150	150	150	178	1057: J-1878	TRUE
J-1906	479: Zone-Main	TRUE	185	297	298	150	150	150	224	6192: 116421	TRUE
J-1908	479: Zone-Main	TRUE	100	298	298	150	150	150	231	6014: 3891	TRUE
J-1910	479: Zone-Main	TRUE	100	300	300	150	255	150	251	6014: 3891	TRUE
J-1912	479: Zone-Main	TRUE	185	225	225	150	150	150	323	6192: 116421	TRUE
J-1914	479: Zone-Main	TRUE	185	300	301	150	303	150	275	6192: 116421	TRUE
J-1916	479: Zone-Main	TRUE	100	300	300	150	297	150	275	6014: 3891	TRUE
J-1918	479: Zone-Main	TRUE	225	300	300	150	605	150	383	6014: 3891	TRUE
J-1920	479: Zone-Main	TRUE	185	208	209	150	150	150	150	2274: J-2086	TRUE
J-1930	479: Zone-Main	TRUE	185	232	232	150	150	150	153	1103: J-1978	TRUE
J-1932	479: Zone-Main	TRUE	185	231	232	150	150	150	151	1103: J-1978	TRUE
J-194	479: Zone-Main	TRUE	No Hydrant	300	300	150	280	150	276	6014: 3891	TRUE
J-196	479: Zone-Main	TRUE	100	224	224	150	150	150	208	6014: 3891	TRUE
J-1974	479: Zone-Main	TRUE	No Hydrant	216	216	150	150	150	169	6014: 3891	TRUE
J-1978	479: Zone-Main	TRUE	185	221	221	150	150	150	159	1104: J-1980	TRUE
J-1980	479: Zone-Main	TRUE	185	215	215	150	150	150	157	1106: J-1984	TRUE
J-1982	479: Zone-Main	TRUE	No Hydrant	196	196	150	150	150	195	6014: 3891	TRUE
J-1984	479: Zone-Main	TRUE	185	210	210	150	150	150	170	2262: J-2082	TRUE
J-1988	479: Zone-Main	TRUE	No Hydrant	229	229	150	150	150	166	6014: 3891	TRUE
J-1992	479: Zone-Main	TRUE	No Hydrant	186	186	150	150	150	183	6014: 3891	TRUE
J-1994	479: Zone-Main	TRUE	185	230	230	150	150	150	154	1103: J-1978	TRUE
J-1996	479: Zone-Main	TRUE	No Hydrant	230	230	150	153	150	150	6014: 3891	TRUE

Table C2: Existing System Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-1998	479: Zone-Main	FALSE	225	96	97	150	150	150	334	561: J-38	TRUE
J-1999	479: Zone-Main	TRUE	No Hydrant	190	190	150	150	150	182	6014: 3891	TRUE
J-20	479: Zone-Main	FALSE	225	218	219	150	150	150	204	3247: J-2383	TRUE
J-200	479: Zone-Main	TRUE	185	284	285	150	150	150	276	6192: 116421	TRUE
J-2001	479: Zone-Main	TRUE	No Hydrant	271	271	150	208	150	150	18310: J-3888	TRUE
J-2002	479: Zone-Main	TRUE	225	300	301	150	340	150	194	18310: J-3888	TRUE
J-2003	479: Zone-Main	TRUE	No Hydrant	300	300	150	163	150	155	6014: 3891	TRUE
J-2004	479: Zone-Main	TRUE	225	284	284	150	150	150	171	18310: J-3888	TRUE
J-2005	479: Zone-Main	TRUE	225	276	277	150	150	150	172	18310: J-3888	TRUE
J-2006	479: Zone-Main	TRUE	100	300	300	150	279	150	291	6014: 3891	TRUE
J-2008	479: Zone-Main	TRUE	No Hydrant	300	300	150	328	150	315	6014: 3891	TRUE
J-2009	479: Zone-Main	TRUE	185	300	300	150	294	150	301	6014: 3891	TRUE
J-2010	479: Zone-Main	TRUE	No Hydrant	300	300	150	231	150	237	6014: 3891	TRUE
J-2011	479: Zone-Main	TRUE	185	243	244	150	150	150	212	2103: J-2012	TRUE
J-2012	479: Zone-Main	TRUE	185	230	230	150	150	150	229	2101: J-2011	TRUE
J-2013	479: Zone-Main	TRUE	No Hydrant	300	300	150	229	150	242	6014: 3891	TRUE
J-2014	479: Zone-Main	TRUE	100	300	301	150	252	150	273	6014: 3891	TRUE
J-2015	479: Zone-Main	TRUE	100	300	300	150	257	150	273	6014: 3891	TRUE
J-2016	479: Zone-Main	TRUE	185	281	282	150	150	150	281	2114: J-2017	TRUE
J-2017	479: Zone-Main	TRUE	185	300	300	150	232	150	257	2112: J-2016	TRUE
J-2018	479: Zone-Main	TRUE	185	300	301	150	288	150	292	6014: 3891	TRUE
J-2019	479: Zone-Main	TRUE	185	300	300	150	181	150	264	2114: J-2017	TRUE
J-2020	479: Zone-Main	TRUE	100	300	300	150	239	150	267	6014: 3891	TRUE
J-2021	479: Zone-Main	TRUE	100	300	300	150	169	150	276	6014: 3891	TRUE
J-2022	479: Zone-Main	TRUE	No Hydrant	300	300	150	320	150	309	6014: 3891	TRUE
J-2023	479: Zone-Main	TRUE	100	300	300	150	318	150	312	6014: 3891	TRUE
J-2024	479: Zone-Main	TRUE	225	300	300	150	321	150	313	6014: 3891	TRUE
J-2025	479: Zone-Main	TRUE	100	300	301	150	325	150	314	6014: 3891	TRUE
J-2026	479: Zone-Main	TRUE	100	300	300	150	186	150	290	6014: 3891	TRUE
J-2027	479: Zone-Main	TRUE	185	300	300	150	276	150	288	6014: 3891	TRUE
J-2028	479: Zone-Main	TRUE	100	300	300	150	173	150	229	6014: 3891	TRUE
J-2029	479: Zone-Main	TRUE	100	274	275	150	150	150	264	6014: 3891	TRUE
J-2030	479: Zone-Main	TRUE	100	300	300	150	164	150	232	6014: 3891	TRUE
J-2031	479: Zone-Main	TRUE	100	300	301	150	230	150	209	2393: J-2128	TRUE
J-2032	479: Zone-Main	TRUE	100	281	281	150	150	150	162	2163: J-2036	TRUE
J-2033	479: Zone-Main	TRUE	100	284	284	150	150	150	171	2163: J-2036	TRUE
J-2034	479: Zone-Main	TRUE	100	264	264	150	150	150	186	2163: J-2036	TRUE
J-2035	479: Zone-Main	TRUE	100	264	265	150	150	150	159	2163: J-2036	TRUE
J-2036	479: Zone-Main	TRUE	100	203	203	150	150	150	192	2165: J-2037	TRUE
J-2037	479: Zone-Main	TRUE	100	195	195	150	150	150	201	2163: J-2036	TRUE
J-2038	479: Zone-Main	TRUE	100	199	199	150	150	150	193	2165: J-2037	TRUE
J-2039	479: Zone-Main	TRUE	No Hydrant	159	159	150	150	150	193	905: J-1538	TRUE
J-2041	479: Zone-Main	TRUE	225	300	300	150	205	150	207	499: J-322	TRUE
J-2042	479: Zone-Main	TRUE	100	241	241	150	150	150	197	6014: 3891	TRUE
J-2043	479: Zone-Main	TRUE	100	248	249	150	150	150	181	6014: 3891	TRUE
J-2044	479: Zone-Main	TRUE	100	300	300	150	218	150	219	6014: 3891	TRUE
J-2047	479: Zone-Main	TRUE	100	240	240	150	150	150	161	2193: J-2049	TRUE
J-2048	479: Zone-Main	TRUE	100	244	244	150	150	150	172	6014: 3891	TRUE
J-2049	479: Zone-Main	TRUE	100	194	194	150	150	150	168	2195: J-2050	TRUE
J-205	479: Zone-Main	TRUE	No Hydrant	300	300	150	324	150	317	6014: 3891	TRUE
J-2050	479: Zone-Main	TRUE	100	180	181	150	150	150	172	2197: J-2051	TRUE
J-2051	479: Zone-Main	TRUE	100	173	174	150	150	150	193	2199: J-2052	TRUE
J-2052	479: Zone-Main	TRUE	100	174	174	150	150	150	191	2197: J-2051	TRUE
J-2053	479: Zone-Main	TRUE	100	181	181	150	150	150	165	2199: J-2052	TRUE
J-2054	479: Zone-Main	TRUE	100	197	198	150	150	150	162	2199: J-2052	TRUE
J-2055	479: Zone-Main	TRUE	100	233	233	150	150	150	160	2199: J-2052	TRUE
J-2056	479: Zone-Main	TRUE	No Hydrant	269	269	150	151	150	150	6014: 3891	TRUE
J-2057	479: Zone-Main	TRUE	No Hydrant	222	222	150	150	150	214	6014: 3891	TRUE
J-2058	479: Zone-Main	TRUE	185	300	300	150	302	150	260	6192: 116421	TRUE
J-2059	479: Zone-Main	TRUE	100	300	300	150	290	150	256	6014: 3891	TRUE
J-2060	479: Zone-Main	TRUE	100	300	300	150	284	150	247	6014: 3891	TRUE
J-2061	479: Zone-Main	TRUE	100	300	300	150	262	150	235	6014: 3891	TRUE
J-2062	479: Zone-Main	TRUE	100	300	301	150	251	150	229	6014: 3891	TRUE
J-2063	479: Zone-Main	TRUE	100	300	300	150	283	150	251	6014: 3891	TRUE
J-2064	479: Zone-Main	TRUE	100	274	274	150	155	150	150	6014: 3891	TRUE
J-2065	479: Zone-Main	TRUE	No Hydrant	262	262	150	160	150	150	6014: 3891	TRUE
J-2066	479: Zone-Main	TRUE	100	266	266	150	158	150	150	6014: 3891	TRUE
J-2067	479: Zone-Main	TRUE	100	300	300	150	234	150	217	6014: 3891	TRUE
J-2068	479: Zone-Main	TRUE	185	216	217	150	161	150	150	2259: J-2080	TRUE
J-2069	479: Zone-Main	TRUE	100	155	155	150	157	150	150	2259: J-2080	TRUE
J-2070	479: Zone-Main	FALSE	185	144	144	150	150	150	191	2259: J-2080	TRUE
J-2071	479: Zone-Main	TRUE	No Hydrant	300	300	150	316	150	269	6014: 3891	TRUE
J-2072	479: Zone-Main	TRUE	225	300	301	150	192	150	186	2251: J-2076	TRUE
J-2073	479: Zone-Main	TRUE	225	288	289	150	150	150	204	2251: J-2076	TRUE
J-2074	479: Zone-Main	TRUE	No Hydrant	212	212	150	153	150	150	6014: 3891	TRUE
J-2075	479: Zone-Main	TRUE	No Hydrant	178	178	150	150	150	150	2251: J-2076	TRUE
J-2076	479: Zone-Main	TRUE	No Hydrant	105	105	150	150	150	361	2249: J-2075	TRUE
J-2077	479: Zone-Main	TRUE	100	169	169	150	150	150	305	6014: 3891	TRUE
J-2078	479: Zone-Main	TRUE	100	167	167	150	150	150	307	6014: 3891	TRUE
J-2079	479: Zone-Main	TRUE	100	165	165	150	150	150	314	6014: 3891	TRUE
J-208	479: Zone-Main	TRUE	100	300	300	150	282	150	294	6014: 3891	TRUE
J-2080	479: Zone-Main	TRUE	100	131	131	150	150	150	239	2238: J-2070	TRUE
J-2082	479: Zone-Main	TRUE	185	207	208	150	150	150	177	1106: J-1984	TRUE
J-2083	479: Zone-Main	TRUE	185	222	222	150	150	150	175	2269: J-2084	TRUE
J-2084	479: Zone-Main	TRUE	185	191	192	150	150	150	168	1109: J-1992	TRUE
J-2085	479: Zone-Main	TRUE	100	146	146	150	150	150	235	1057: J-1878	TRUE
J-2086	479: Zone-Main	FALSE	185	155	155	150	150	150	305	1074: J-1920	TRUE
J-2087	479: Zone-Main	TRUE	100	220	220	150	150	150	167	6014: 3891	TRUE
J-2088	479: Zone-Main	TRUE	100	114	114	150	150	150	389	6014: 3891	TRUE
J-2089	479: Zone-Main	FALSE	225	212	213	150	150	150	175	2279: J-2088	TRUE

Table C2: Existing System Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-2090	479: Zone-Main	TRUE	100	261	261	150	150	150	175	6014: 3891	TRUE
J-2091	479: Zone-Main	TRUE	100	112	112	150	150	150	389	6014: 3891	TRUE
J-2092	479: Zone-Main	TRUE	185	251	252	150	150	150	188	2288: J-2091	TRUE
J-2093	479: Zone-Main	TRUE	100	264	264	150	150	150	240	6014: 3891	TRUE
J-2094	479: Zone-Main	TRUE	100	122	123	150	150	150	386	6014: 3891	TRUE
J-2095	479: Zone-Main	TRUE	185	220	221	150	150	150	227	582: J-29	TRUE
J-2096	479: Zone-Main	TRUE	No Hydrant	297	297	150	160	150	150	6014: 3891	TRUE
J-2097	479: Zone-Main	FALSE	225	85	85	150	163	150	150	2308: J-2098	TRUE
J-2098	479: Zone-Main	FALSE	225	44	44	150	150	150	392	2306: J-2097	TRUE
J-2099	479: Zone-Main	TRUE	225	291	292	150	150	150	252	2313: J-2100	TRUE
J-21	479: Zone-Main	TRUE	No Hydrant	300	300	150	269	150	259	6014: 3891	TRUE
J-2100	479: Zone-Main	TRUE	100	128	129	150	150	150	386	6014: 3891	TRUE
J-2101	479: Zone-Main	TRUE	100	204	204	150	150	150	288	6014: 3891	TRUE
J-2102	479: Zone-Main	TRUE	100	168	169	150	150	150	359	6014: 3891	TRUE
J-2103	479: Zone-Main	TRUE	100	219	219	150	150	150	292	6014: 3891	TRUE
J-2105	479: Zone-Main	TRUE	225	294	295	150	150	150	238	2330: J-2106	TRUE
J-2106	479: Zone-Main	TRUE	100	128	128	150	150	150	386	6014: 3891	TRUE
J-2107	479: Zone-Main	FALSE	225	191	191	150	150	150	301	2330: J-2106	TRUE
J-2108	479: Zone-Main	FALSE	100	71	71	150	150	150	391	6014: 3891	TRUE
J-2109	479: Zone-Main	FALSE	225	154	154	150	150	150	194	2343: J-2110	TRUE
J-2110	479: Zone-Main	FALSE	225	129	129	150	163	150	205	2345: J-2111	TRUE
J-2111	479: Zone-Main	FALSE	225	132	133	150	150	150	164	2343: J-2110	TRUE
J-2112	479: Zone-Main	FALSE	225	147	147	150	150	150	152	2345: J-2111	TRUE
J-2113	479: Zone-Main	FALSE	225	48	48	150	150	150	167	18038: HYD_85	TRUE
J-2114	479: Zone-Main	FALSE	225	152	153	150	150	150	169	3220: J-2374	TRUE
J-2115	479: Zone-Main	FALSE	225	188	188	150	150	150	176	867: J-1462	TRUE
J-2116	479: Zone-Main	TRUE	100	145	146	150	174	150	169	18851: J-3989	TRUE
J-2117	479: Zone-Main	TRUE	100	137	137	150	150	150	200	3283: J-2395	TRUE
J-2118	479: Zone-Main	FALSE	100	100	101	150	150	150	322	3283: J-2395	TRUE
J-2119	479: Zone-Main	TRUE	100	141	141	150	179	150	213	3283: J-2395	TRUE
J-2120	479: Zone-Main	TRUE	100	140	140	150	150	150	184	2374: J-2121	TRUE
J-2121	479: Zone-Main	FALSE	100	96	96	150	150	150	261	2376: J-2122	TRUE
J-2122	479: Zone-Main	FALSE	100	98	99	150	150	150	256	2374: J-2121	TRUE
J-2123	479: Zone-Main	TRUE	100	140	140	150	150	150	174	2376: J-2122	TRUE
J-2124	479: Zone-Main	TRUE	100	300	300	150	326	150	295	6014: 3891	TRUE
J-2125	479: Zone-Main	TRUE	100	300	301	150	222	150	312	6014: 3891	TRUE
J-2126	479: Zone-Main	TRUE	100	300	300	150	281	150	307	6014: 3891	TRUE
J-2127	479: Zone-Main	TRUE	100	211	211	150	150	150	152	2393: J-2128	TRUE
J-2128	479: Zone-Main	TRUE	100	173	173	150	150	150	189	16615: J-3802	TRUE
J-2130	479: Zone-Main	TRUE	225	300	300	150	488	150	359	6014: 3891	TRUE
J-2131	479: Zone-Main	FALSE	100	79	79	150	150	150	392	6014: 3891	TRUE
J-2133	479: Zone-Main	TRUE	100	116	116	150	150	150	247	16442: J-3730	TRUE
J-2134	479: Zone-Main	TRUE	No Hydrant	261	261	150	150	150	274	6014: 3891	TRUE
J-2135	479: Zone-Main	TRUE	No Hydrant	300	300	150	484	150	384	6014: 3891	TRUE
J-2136	479: Zone-Main	TRUE	No Hydrant	238	238	150	150	150	265	6014: 3891	TRUE
J-2137	479: Zone-Main	FALSE	185	133	139	150	150	150	387	6014: 3891	TRUE
J-2138	479: Zone-Main	TRUE	No Hydrant	196	196	150	150	150	341	6014: 3891	TRUE
J-2139	479: Zone-Main	TRUE	225	300	301	150	205	150	359	6014: 3891	TRUE
J-2141	479: Zone-Main	TRUE	No Hydrant	300	300	150	560	150	384	6014: 3891	TRUE
J-2142	479: Zone-Main	TRUE	225	300	300	150	559	150	384	6014: 3891	TRUE
J-2143	479: Zone-Main	TRUE	225	230	230	150	150	150	389	6014: 3891	TRUE
J-2152	479: Zone-Main	TRUE	No Hydrant	259	259	150	167	150	150	18310: J-3888	TRUE
J-217	479: Zone-Main	TRUE	100	300	301	150	243	150	268	6014: 3891	TRUE
J-2230	479: Zone-Main	TRUE	No Hydrant	300	300	150	217	150	300	6014: 3891	TRUE
J-2280	479: Zone-Main	TRUE	No Hydrant	232	232	150	154	150	150	16598: J-3795	TRUE
J-23	479: Zone-Main	TRUE	225	300	301	150	293	150	294	6014: 3891	TRUE
J-2309	479: Zone-Main	FALSE	225	175	175	150	158	150	150	7023: 393523	TRUE
J-2319	479: Zone-Main	TRUE	No Hydrant	91	91	150	150	150	273	2980: J-2320	TRUE
J-2320	479: Zone-Main	FALSE	225	97	98	150	150	150	247	2976: J-2319	TRUE
J-2321	479: Zone-Main	FALSE	225	108	109	150	150	150	379	3232: J-2378	TRUE
J-2322	479: Zone-Main	TRUE	100	130	130	150	150	150	386	6014: 3891	TRUE
J-2323	479: Zone-Main	FALSE	225	107	107	150	150	150	375	3235: J-2379	TRUE
J-2324	479: Zone-Main	TRUE	No Hydrant	102	102	150	150	150	164	18032: HYD_114	TRUE
J-2325	479: Zone-Main	FALSE	185	108	108	150	150	150	372	3241: J-2381	TRUE
J-2326	479: Zone-Main	TRUE	No Hydrant	250	250	150	150	150	255	6014: 3891	TRUE
J-2333	479: Zone-Main	FALSE	225	151	152	150	150	150	324	3162: J-2354	TRUE
J-2354	479: Zone-Main	FALSE	225	141	141	150	150	150	372	3159: J-2353	TRUE
J-2355	479: Zone-Main	FALSE	185	127	128	150	150	150	333	3168: J-2356	TRUE
J-2356	479: Zone-Main	FALSE	185	130	130	150	150	150	317	3165: J-2355	TRUE
J-2357	479: Zone-Main	TRUE	100	177	177	150	150	150	294	6014: 3891	TRUE
J-2358	479: Zone-Main	TRUE	100	125	126	150	150	150	313	6014: 3891	TRUE
J-2359	479: Zone-Main	TRUE	100	171	172	150	150	150	314	6014: 3891	TRUE
J-2360	479: Zone-Main	TRUE	100	125	125	150	150	150	318	6014: 3891	TRUE
J-2361	479: Zone-Main	TRUE	100	134	134	150	150	150	376	6014: 3891	TRUE
J-2362	479: Zone-Main	TRUE	100	164	164	150	150	150	258	6014: 3891	TRUE
J-2363	479: Zone-Main	TRUE	100	153	153	150	150	150	292	6014: 3891	TRUE
J-2364	479: Zone-Main	TRUE	185	195	195	150	150	150	350	6014: 3891	TRUE
J-2366	479: Zone-Main	FALSE	225	162	162	150	150	150	385	6014: 3891	TRUE
J-2367	479: Zone-Main	TRUE	225	236	237	150	150	150	223	555: J-271	TRUE
J-2368	479: Zone-Main	FALSE	225	121	122	150	150	150	313	3208: J-2370	TRUE
J-2369	479: Zone-Main	FALSE	185	180	180	150	150	150	360	6014: 3891	TRUE
J-2370	479: Zone-Main	TRUE	100	121	121	150	150	150	327	6014: 3891	TRUE
J-2371	479: Zone-Main	TRUE	100	201	201	150	150	150	177	6014: 3891	TRUE
J-2372	479: Zone-Main	TRUE	225	300	301	150	445	150	358	6014: 3891	TRUE
J-2373	479: Zone-Main	FALSE	185	126	126	150	150	150	315	2986: J-2321	TRUE
J-2374	479: Zone-Main	FALSE	225	65	66	150	150	150	169	18038: HYD_85	TRUE
J-2375	479: Zone-Main	FALSE	225	123	124	150	150	150	301	2994: J-2323	TRUE
J-2376	479: Zone-Main	TRUE	No Hydrant	206	206	150	150	150	360	6014: 3891	TRUE
J-2377	479: Zone-Main	TRUE	No Hydrant	300	300	150	322	150	312	6014: 3891	TRUE
J-2378	479: Zone-Main	FALSE	225	122	122	150	150	150	296	2986: J-2321	TRUE

Table C2: Existing System Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-2379	479: Zone-Main	FALSE	225	120	121	150	150	150	291	2994: J-2323	TRUE
J-2380	479: Zone-Main	TRUE	No Hydrant	118	118	150	150	150	271	6014: 3891	TRUE
J-2381	479: Zone-Main	FALSE	185	119	120	150	150	150	282	3000: J-2325	TRUE
J-2382	479: Zone-Main	TRUE	No Hydrant	109	109	150	150	150	171	18029: HYD 113	TRUE
J-2383	479: Zone-Main	FALSE	225	129	130	150	153	150	315	3000: J-2325	TRUE
J-2384	479: Zone-Main	TRUE	225	288	289	150	150	150	174	3003: J-2326	TRUE
J-2385	479: Zone-Main	FALSE	225	145	146	150	150	150	385	6014: 3891	TRUE
J-2386	479: Zone-Main	TRUE	100	159	159	150	150	150	382	6014: 3891	TRUE
J-2387	479: Zone-Main	TRUE	100	112	112	150	150	150	387	6014: 3891	TRUE
J-2388	479: Zone-Main	FALSE	100	81	81	150	150	150	183	19115: J-4045	TRUE
J-2389	479: Zone-Main	TRUE	100	126	127	150	150	150	387	6014: 3891	TRUE
J-2390	479: Zone-Main	TRUE	100	174	175	150	150	150	353	6014: 3891	TRUE
J-2391	479: Zone-Main	TRUE	100	116	116	150	150	150	388	6014: 3891	TRUE
J-2392	479: Zone-Main	FALSE	100	98	98	150	150	150	375	799: J-1300	TRUE
J-2393	479: Zone-Main	TRUE	100	113	114	150	150	150	387	6014: 3891	TRUE
J-2394	479: Zone-Main	TRUE	225	300	300	150	155	150	283	533: J-317	TRUE
J-2395	479: Zone-Main	TRUE	100	107	107	150	150	150	308	2362: J-2117	TRUE
J-2396	479: Zone-Main	TRUE	100	133	133	150	150	150	386	6014: 3891	TRUE
J-2397	479: Zone-Main	TRUE	100	130	131	150	150	150	387	6014: 3891	TRUE
J-2398	479: Zone-Main	TRUE	100	106	107	150	150	150	389	6014: 3891	TRUE
J-2399	479: Zone-Main	TRUE	100	131	131	150	150	150	345	798: J-1298	TRUE
J-24	479: Zone-Main	TRUE	225	300	300	150	279	150	304	6014: 3891	TRUE
J-2400	479: Zone-Main	TRUE	100	129	130	150	150	150	316	893: J-1514	TRUE
J-2401	479: Zone-Main	TRUE	225	300	301	150	293	150	279	6192: 116421	TRUE
J-2402	479: Zone-Main	TRUE	225	300	302	150	300	150	288	6192: 116421	TRUE
J-2403	479: Zone-Main	FALSE	225	221	222	150	150	150	291	585: J-104	TRUE
J-2404	479: Zone-Main	TRUE	225	301	301	150	223	150	318	6014: 3891	TRUE
J-2405	479: Zone-Main	FALSE	225	126	127	150	181	150	389	6014: 3891	TRUE
J-2406	479: Zone-Main	TRUE	100	132	133	150	165	150	387	6014: 3891	TRUE
J-2407	479: Zone-Main	TRUE	100	121	121	150	150	150	347	790: J-1282	TRUE
J-2408	479: Zone-Main	TRUE	100	126	126	150	150	150	322	790: J-1282	TRUE
J-2410	479: Zone-Main	TRUE	100	131	131	150	150	150	386	6014: 3891	TRUE
J-2411	479: Zone-Main	TRUE	225	300	301	150	372	150	384	6014: 3891	TRUE
J-2412	479: Zone-Main	TRUE	185	187	187	150	150	150	386	6014: 3891	TRUE
J-2413	479: Zone-Main	FALSE	185	149	149	150	150	150	386	778: J-1256	TRUE
J-2414	479: Zone-Main	FALSE	225	175	176	150	150	150	386	545: J-284	TRUE
J-2415	479: Zone-Main	FALSE	225	144	145	150	179	150	391	867: J-1462	TRUE
J-2416	479: Zone-Main	FALSE	225	216	217	150	150	150	311	18310: J-3888	TRUE
J-2419	479: Zone-Main	FALSE	185	182	182	150	150	150	270	18345: J-3904	TRUE
J-2439	479: Zone-Main	TRUE	100	285	286	150	154	150	150	16598: J-3795	TRUE
J-2449	479: Zone-Main	TRUE	100	208	208	150	150	150	254	16598: J-3795	TRUE
J-25	479: Zone-Main	TRUE	No Hydrant	173	173	150	150	150	278	6014: 3891	TRUE
J-2536	479: Zone-Main	TRUE	100	210	210	150	150	150	249	16598: J-3795	TRUE
J-2539	479: Zone-Main	TRUE	100	219	219	150	150	150	236	16598: J-3795	TRUE
J-26	479: Zone-Main	TRUE	185	300	300	150	194	150	248	6014: 3891	TRUE
J-2669	479: Zone-Main	TRUE	No Hydrant	223	223	150	150	150	211	18310: J-3888	TRUE
J-267	479: Zone-Main	TRUE	No Hydrant	300	300	150	377	150	359	6014: 3891	TRUE
J-268	479: Zone-Main	TRUE	No Hydrant	300	300	150	376	150	359	6014: 3891	TRUE
J-269	479: Zone-Main	TRUE	No Hydrant	300	300	150	375	150	359	6014: 3891	TRUE
J-27	479: Zone-Main	TRUE	225	300	301	150	167	150	212	2308: J-2098	TRUE
J-270	479: Zone-Main	FALSE	225	161	161	150	150	150	302	16622: J-3806	TRUE
J-271	479: Zone-Main	FALSE	225	223	223	150	150	150	257	3199: J-2367	TRUE
J-272	479: Zone-Main	TRUE	No Hydrant	251	251	150	150	150	239	6014: 3891	TRUE
J-2721	479: Zone-Main	TRUE	No Hydrant	249	249	150	150	150	161	18310: J-3888	TRUE
J-273	479: Zone-Main	TRUE	185	300	300	150	427	150	353	6014: 3891	TRUE
J-2731	479: Zone-Main	TRUE	No Hydrant	281	281	150	152	150	150	16598: J-3795	TRUE
J-274	479: Zone-Main	TRUE	No Hydrant	300	300	150	369	150	354	6014: 3891	TRUE
J-275	479: Zone-Main	TRUE	100	212	213	150	150	150	193	6014: 3891	TRUE
J-276	479: Zone-Main	TRUE	225	249	249	150	150	150	176	870: J-1468	TRUE
J-2762	479: Zone-Main	FALSE	225	206	206	150	150	150	151	6635: 187778	TRUE
J-2766	479: Zone-Main	TRUE	100	300	300	150	313	150	301	6014: 3891	TRUE
J-2787	479: Zone-Main	FALSE	225	162	163	150	150	150	196	6136: 110603	TRUE
J-28	479: Zone-Main	TRUE	225	300	300	150	299	150	290	6192: 116421	TRUE
J-280	479: Zone-Main	TRUE	No Hydrant	300	300	150	545	150	385	6014: 3891	TRUE
J-281	479: Zone-Main	TRUE	No Hydrant	300	300	150	555	150	384	6014: 3891	TRUE
J-282	479: Zone-Main	TRUE	No Hydrant	300	300	150	482	150	384	6014: 3891	TRUE
J-283	479: Zone-Main	TRUE	225	300	300	150	326	150	359	6834: 377340	TRUE
J-284	479: Zone-Main	TRUE	No Hydrant	260	260	150	150	150	188	6014: 3891	TRUE
J-285	479: Zone-Main	TRUE	No Hydrant	300	300	150	484	150	359	6014: 3891	TRUE
J-286	479: Zone-Main	TRUE	No Hydrant	200	200	150	150	150	243	6014: 3891	TRUE
J-2865	479: Zone-Main	TRUE	100	286	286	150	156	150	150	16598: J-3795	TRUE
J-287	479: Zone-Main	FALSE	225	176	176	150	150	150	221	3223: J-2375	TRUE
J-288	479: Zone-Main	TRUE	No Hydrant	300	300	150	356	150	348	6014: 3891	TRUE
J-289	479: Zone-Main	TRUE	No Hydrant	300	300	150	283	150	283	6014: 3891	TRUE
J-29	479: Zone-Main	TRUE	185	221	221	150	150	150	228	2299: J-2095	TRUE
J-290	479: Zone-Main	TRUE	225	225	226	150	150	150	357	6014: 3891	TRUE
J-291	479: Zone-Main	TRUE	No Hydrant	274	274	150	150	150	256	6014: 3891	TRUE
J-292	479: Zone-Main	TRUE	100	229	230	150	150	150	296	6014: 3891	TRUE
J-293	479: Zone-Main	TRUE	225	280	280	150	150	150	244	2990: J-2322	TRUE
J-294	479: Zone-Main	TRUE	No Hydrant	187	187	150	150	150	358	6014: 3891	TRUE
J-295	479: Zone-Main	TRUE	225	248	248	150	150	150	272	2321: J-2103	TRUE
J-296	479: Zone-Main	TRUE	No Hydrant	294	294	150	150	150	241	6014: 3891	TRUE
J-297	479: Zone-Main	TRUE	No Hydrant	300	300	150	178	150	196	6014: 3891	TRUE
J-298	479: Zone-Main	FALSE	185	164	165	150	150	150	359	582: J-29	TRUE
J-299	479: Zone-Main	TRUE	100	203	204	150	150	150	197	6014: 3891	TRUE
J-30	479: Zone-Main	TRUE	No Hydrant	219	219	150	150	150	186	6014: 3891	TRUE
J-300	479: Zone-Main	FALSE	185	176	176	150	150	150	289	16458: J-3737	TRUE
J-301	479: Zone-Main	TRUE	100	255	255	150	150	150	226	6014: 3891	TRUE
J-302	479: Zone-Main	TRUE	100	211	211	150	150	150	256	6014: 3891	TRUE
J-303	479: Zone-Main	TRUE	225	300	300	150	388	150	360	6014: 3891	TRUE

Table C2: Existing System Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-304	479: Zone-Main	TRUE	No Hydrant	300	300	150	391	150	362	6014: 3891	TRUE
J-305	479: Zone-Main	TRUE	No Hydrant	300	300	150	392	150	362	6014: 3891	TRUE
J-307	479: Zone-Main	TRUE	225	300	300	150	396	150	359	6014: 3891	TRUE
J-308	479: Zone-Main	TRUE	No Hydrant	300	300	150	396	150	359	6014: 3891	TRUE
J-309	479: Zone-Main	TRUE	No Hydrant	300	300	150	305	150	339	6014: 3891	TRUE
J-3095	479: Zone-Main	FALSE	225	224	224	150	170	150	150	6834: 377340	TRUE
J-31	479: Zone-Main	TRUE	No Hydrant	208	208	150	150	150	225	6014: 3891	TRUE
J-310	479: Zone-Main	FALSE	225	136	137	150	168	150	388	540: J-311	TRUE
J-3100	479: Zone-Main	FALSE	225	198	198	150	150	150	158	6135: 110585	TRUE
J-311	479: Zone-Main	TRUE	No Hydrant	300	300	150	171	150	233	6014: 3891	TRUE
J-312	479: Zone-Main	TRUE	100	206	206	150	150	150	186	6014: 3891	TRUE
J-3122	479: Zone-Main	TRUE	100	158	158	150	150	150	213	6731: 370154	TRUE
J-3127	479: Zone-Main	TRUE	225	257	257	150	167	150	150	6834: 377340	TRUE
J-313	479: Zone-Main	TRUE	225	273	273	150	150	150	180	498: J-312	TRUE
J-314	479: Zone-Main	TRUE	100	273	273	150	150	150	215	6014: 3891	TRUE
J-3140	479: Zone-Main	TRUE	100	274	274	150	150	150	168	16598: J-3795	TRUE
J-315	479: Zone-Main	TRUE	100	300	300	150	155	150	192	6014: 3891	TRUE
J-3153	479: Zone-Main	FALSE	225	191	191	150	150	150	199	14696: J-3323	TRUE
J-316	479: Zone-Main	TRUE	185	289	289	150	150	150	206	894: J-1516	TRUE
J-317	479: Zone-Main	TRUE	100	300	301	150	215	150	261	6014: 3891	TRUE
J-3178	479: Zone-Main	TRUE	100	300	300	150	244	150	258	6014: 3891	TRUE
J-318	479: Zone-Main	TRUE	No Hydrant	300	300	150	247	150	275	6014: 3891	TRUE
J-319	479: Zone-Main	TRUE	100	300	300	150	249	150	272	6014: 3891	TRUE
J-32	479: Zone-Main	TRUE	100	235	235	150	150	150	206	6014: 3891	TRUE
J-320	479: Zone-Main	TRUE	185	239	239	150	150	150	249	530: J-321	TRUE
J-321	479: Zone-Main	TRUE	100	240	240	150	150	150	245	6014: 3891	TRUE
J-3216	479: Zone-Main	TRUE	225	261	263	150	170	150	150	18345: J-3904	TRUE
J-322	479: Zone-Main	TRUE	No Hydrant	300	300	150	156	150	173	6014: 3891	TRUE
J-323	479: Zone-Main	TRUE	No Hydrant	202	202	150	150	150	277	6014: 3891	TRUE
J-324	479: Zone-Main	TRUE	185	300	300	150	292	150	290	6192: 116421	TRUE
J-325	479: Zone-Main	TRUE	225	300	301	150	239	150	264	18392: J-3916	TRUE
J-326	479: Zone-Main	TRUE	No Hydrant	300	300	150	370	150	354	6014: 3891	TRUE
J-3277	479: Zone-Main	TRUE	100	259	259	150	150	150	187	16598: J-3795	TRUE
J-328	479: Zone-Main	TRUE	No Hydrant	300	300	150	550	150	384	6014: 3891	TRUE
J-33	479: Zone-Main	TRUE	No Hydrant	300	300	150	237	150	242	6014: 3891	TRUE
J-330	479: Zone-Main	TRUE	No Hydrant	300	300	150	353	150	358	6014: 3891	TRUE
J-3302	479: Zone-Main	TRUE	100	268	268	150	150	150	188	6014: 3891	TRUE
J-3323	479: Zone-Main	FALSE	225	215	217	150	150	150	151	14134: J-3153	TRUE
J-34	479: Zone-Main	TRUE	185	279	280	150	159	150	150	563: J-35	TRUE
J-3449	479: Zone-Main	TRUE	100	286	286	150	154	150	150	16598: J-3795	TRUE
J-35	479: Zone-Main	FALSE	225	224	225	150	150	150	267	564: J-34	TRUE
J-36	479: Zone-Main	TRUE	225	300	300	150	307	150	272	6192: 116421	TRUE
J-3643	479: Zone-Main	FALSE	225	115	115	150	169	150	150	5951: 1680	TRUE
J-3656	479: Zone-Main	TRUE	225	284	285	150	150	150	155	18310: J-3888	TRUE
J-3659	479: Zone-Main	FALSE	225	211	212	150	150	150	154	637: J-131	TRUE
J-3668	479: Zone-Main	TRUE	100	259	259	150	150	150	185	16598: J-3795	TRUE
J-37	479: Zone-Main	TRUE	185	300	300	150	316	150	273	6192: 116421	TRUE
J-3705	479: Zone-Main	TRUE	100	300	300	150	278	150	241	6014: 3891	TRUE
J-3708	479: Zone-Main	FALSE	225	86	86	150	150	150	164	7007: 390267	TRUE
J-3709	479: Zone-Main	TRUE	100	283	283	150	156	150	150	6258: 127105	TRUE
J-3710	479: Zone-Main	TRUE	100	275	275	150	150	150	217	6014: 3891	TRUE
J-3711	479: Zone-Main	TRUE	100	300	300	150	222	150	242	6014: 3891	TRUE
J-3712	479: Zone-Main	TRUE	No Hydrant	300	300	150	318	150	300	6014: 3891	TRUE
J-3713	479: Zone-Main	TRUE	No Hydrant	300	300	150	321	150	307	6014: 3891	TRUE
J-3715	479: Zone-Main	TRUE	No Hydrant	300	300	150	272	150	248	6014: 3891	TRUE
J-3718	479: Zone-Main	FALSE	225	173	174	150	163	150	150	7023: 393523	TRUE
J-3719	479: Zone-Main	FALSE	225	200	200	150	150	150	152	14000: J-3100	TRUE
J-3720	479: Zone-Main	TRUE	No Hydrant	187	187	150	150	150	177	6014: 3891	TRUE
J-3721	479: Zone-Main	TRUE	No Hydrant	205	205	150	150	150	152	6014: 3891	TRUE
J-3722	479: Zone-Main	FALSE	225	210	210	150	150	150	156	6635: 187778	TRUE
J-3724	479: Zone-Main	FALSE	225	206	206	150	150	150	268	18310: J-3888	TRUE
J-3725	479: Zone-Main	TRUE	225	293	294	150	160	150	150	18310: J-3888	TRUE
J-3726	479: Zone-Main	TRUE	No Hydrant	213	213	150	150	150	178	6014: 3891	TRUE
J-3727	479: Zone-Main	TRUE	185	218	218	150	150	150	163	1105: J-1982	TRUE
J-3728	479: Zone-Main	TRUE	No Hydrant	208	208	150	150	150	152	6014: 3891	TRUE
J-3729	479: Zone-Main	TRUE	No Hydrant	158	158	150	158	150	301	6014: 3891	TRUE
J-3730	479: Zone-Main	TRUE	100	117	117	150	150	150	191	745: J-1184	TRUE
J-3731	479: Zone-Main	TRUE	100	116	117	150	150	150	285	874: J-1476	TRUE
J-3732	479: Zone-Main	TRUE	100	124	124	150	150	150	311	6014: 3891	TRUE
J-3733	479: Zone-Main	TRUE	100	158	158	150	152	150	150	6014: 3891	TRUE
J-3734	479: Zone-Main	TRUE	100	129	129	150	150	150	386	6014: 3891	TRUE
J-3735	479: Zone-Main	TRUE	100	131	131	150	167	150	386	6014: 3891	TRUE
J-3736	479: Zone-Main	TRUE	100	216	216	150	151	150	150	6014: 3891	TRUE
J-3737	479: Zone-Main	FALSE	100	91	91	150	150	150	390	6014: 3891	TRUE
J-3738	479: Zone-Main	FALSE	100	93	93	150	150	150	389	6014: 3891	TRUE
J-3739	479: Zone-Main	TRUE	100	180	180	150	150	150	261	6014: 3891	TRUE
J-3740	479: Zone-Main	TRUE	100	216	216	150	150	150	151	6014: 3891	TRUE
J-3741	479: Zone-Main	TRUE	No Hydrant	272	272	150	150	150	214	6014: 3891	TRUE
J-3742	479: Zone-Main	TRUE	No Hydrant	274	274	150	150	150	205	6014: 3891	TRUE
J-3743	479: Zone-Main	TRUE	100	299	299	150	150	150	151	6014: 3891	TRUE
J-3744	479: Zone-Main	TRUE	100	254	254	150	150	150	296	6014: 3891	TRUE
J-3745	479: Zone-Main	TRUE	100	257	257	150	150	150	285	6014: 3891	TRUE
J-3746	479: Zone-Main	TRUE	100	103	103	150	150	150	349	884: J-1496	TRUE
J-3747	479: Zone-Main	FALSE	100	77	78	150	150	150	391	883: J-1494	TRUE
J-3748	479: Zone-Main	FALSE	100	95	95	150	150	150	390	6014: 3891	TRUE
J-3749	479: Zone-Main	TRUE	100	211	212	150	150	150	206	6014: 3891	TRUE
J-3750	479: Zone-Main	TRUE	100	300	300	150	253	150	252	6014: 3891	TRUE
J-3751	479: Zone-Main	TRUE	100	300	300	150	258	150	255	6014: 3891	TRUE
J-3752	479: Zone-Main	TRUE	100	300	300	150	280	150	271	6014: 3891	TRUE
J-3753	479: Zone-Main	TRUE	100	300	300	150	271	150	270	6014: 3891	TRUE

Table C2: Existing System Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-3754	479: Zone-Main	TRUE	100	300	300	150	189	150	271	6014: 3891	TRUE
J-3755	479: Zone-Main	TRUE	100	298	299	150	150	150	273	6014: 3891	TRUE
J-3756	479: Zone-Main	TRUE	100	300	300	150	270	150	267	6014: 3891	TRUE
J-3757	479: Zone-Main	TRUE	225	231	231	150	150	150	338	16501: J-3758	TRUE
J-3758	479: Zone-Main	TRUE	225	300	300	150	213	150	210	16500: J-3757	TRUE
J-3759	479: Zone-Main	TRUE	No Hydrant	119	119	150	150	150	226	16515: J-3764	TRUE
J-3760	479: Zone-Main	TRUE	No Hydrant	180	180	150	155	150	150	6014: 3891	TRUE
J-3761	479: Zone-Main	TRUE	No Hydrant	300	300	150	192	150	192	6014: 3891	TRUE
J-3764	479: Zone-Main	TRUE	No Hydrant	133	133	150	156	150	155	16505: J-3759	TRUE
J-3765	479: Zone-Main	TRUE	No Hydrant	104	104	150	150	150	344	6014: 3891	TRUE
J-3766	479: Zone-Main	TRUE	No Hydrant	137	137	150	157	150	150	6014: 3891	TRUE
J-3767	479: Zone-Main	TRUE	No Hydrant	158	158	150	164	150	158	6014: 3891	TRUE
J-3768	479: Zone-Main	TRUE	No Hydrant	191	191	150	151	150	150	6014: 3891	TRUE
J-3769	479: Zone-Main	TRUE	225	300	301	150	155	150	158	16519: J-3765	TRUE
J-3771	479: Zone-Main	TRUE	185	300	301	150	203	150	241	6014: 3891	TRUE
J-3772	479: Zone-Main	TRUE	No Hydrant	300	300	150	156	150	199	6014: 3891	TRUE
J-3773	479: Zone-Main	TRUE	No Hydrant	300	300	150	277	150	299	6014: 3891	TRUE
J-3774	479: Zone-Main	TRUE	185	193	193	150	150	150	172	6161: 111115	TRUE
J-3777	479: Zone-Main	TRUE	No Hydrant	197	197	150	150	150	326	6014: 3891	TRUE
J-3780	479: Zone-Main	TRUE	No Hydrant	300	300	150	250	150	245	6014: 3891	TRUE
J-3781	479: Zone-Main	TRUE	No Hydrant	300	300	150	256	150	270	6014: 3891	TRUE
J-3782	479: Zone-Main	TRUE	No Hydrant	300	300	150	319	150	304	6014: 3891	TRUE
J-3783	479: Zone-Main	TRUE	No Hydrant	300	300	150	251	150	300	6014: 3891	TRUE
J-3784	479: Zone-Main	TRUE	No Hydrant	300	300	150	204	150	297	6014: 3891	TRUE
J-3785	479: Zone-Main	TRUE	No Hydrant	300	300	150	276	150	290	6014: 3891	TRUE
J-3786	479: Zone-Main	TRUE	100	151	151	150	150	150	227	16580: J-3787	TRUE
J-3787	479: Zone-Main	TRUE	100	177	177	150	151	150	150	16579: J-3786	TRUE
J-3788	479: Zone-Main	TRUE	100	248	248	150	153	150	150	16584: J-3789	TRUE
J-3789	479: Zone-Main	TRUE	100	180	180	150	150	150	274	16579: J-3786	TRUE
J-3790	479: Zone-Main	TRUE	100	300	300	150	232	150	228	6014: 3891	TRUE
J-3791	479: Zone-Main	TRUE	100	146	146	150	150	150	216	16591: J-3792	TRUE
J-3792	479: Zone-Main	TRUE	100	167	167	150	150	150	154	16590: J-3791	TRUE
J-3793	479: Zone-Main	TRUE	100	198	198	150	152	150	150	16591: J-3792	TRUE
J-3794	479: Zone-Main	TRUE	100	169	169	150	150	150	231	16591: J-3792	TRUE
J-3795	479: Zone-Main	TRUE	100	140	140	150	150	150	259	16601: J-3797	TRUE
J-3796	479: Zone-Main	TRUE	100	180	180	150	161	150	150	16598: J-3795	TRUE
J-3797	479: Zone-Main	TRUE	100	151	151	150	155	150	232	16598: J-3795	TRUE
J-3798	479: Zone-Main	TRUE	100	286	288	150	163	150	150	16598: J-3795	TRUE
J-3799	479: Zone-Main	TRUE	100	296	296	150	159	150	150	16598: J-3795	TRUE
J-38	479: Zone-Main	FALSE	225	101	101	150	150	150	317	1112: J-1998	TRUE
J-3800	479: Zone-Main	TRUE	No Hydrant	300	300	150	450	150	384	6014: 3891	TRUE
J-3801	479: Zone-Main	TRUE	100	221	221	150	150	150	236	16598: J-3795	TRUE
J-3802	479: Zone-Main	TRUE	100	282	282	150	150	150	153	16598: J-3795	TRUE
J-3803	479: Zone-Main	TRUE	100	152	152	150	150	150	233	2393: J-2128	TRUE
J-3805	479: Zone-Main	FALSE	225	84	84	150	150	150	178	2393: J-2128	TRUE
J-3806	479: Zone-Main	TRUE	No Hydrant	184	184	150	150	150	155	16626: J-3807	TRUE
J-3807	479: Zone-Main	TRUE	No Hydrant	86	86	150	158	150	150	6014: 3891	TRUE
J-3808	479: Zone-Main	FALSE	225	87	88	150	172	150	150	16621: J-3805	TRUE
J-3809	479: Zone-Main	FALSE	185	125	126	150	150	150	390	18071: J-3861	TRUE
J-3810	479: Zone-Main	TRUE	No Hydrant	276	276	150	150	150	357	6014: 3891	TRUE
J-3811	479: Zone-Main	TRUE	185	300	301	150	356	150	348	6014: 3891	TRUE
J-3812	479: Zone-Main	FALSE	185	115	115	150	150	150	390	6014: 3891	TRUE
J-3813	479: Zone-Main	TRUE	No Hydrant	300	300	150	252	150	336	6014: 3891	TRUE
J-3814	479: Zone-Main	TRUE	225	300	300	150	224	150	285	890: J-1508	TRUE
J-3815	479: Zone-Main	FALSE	225	133	133	150	150	150	173	18041: HYD_35	TRUE
J-3816	479: Zone-Main	TRUE	225	265	265	150	150	150	345	6834: 377340	TRUE
J-3817	479: Zone-Main	TRUE	100	300	300	150	188	150	196	2393: J-2128	TRUE
J-3818	479: Zone-Main	TRUE	225	232	233	150	150	150	159	18044: HYD_45	TRUE
J-3819	479: Zone-Main	TRUE	No Hydrant	300	300	150	399	150	392	6014: 3891	TRUE
J-3820	479: Zone-Main	TRUE	No Hydrant	300	300	150	399	150	392	6014: 3891	TRUE
J-3821	479: Zone-Main	TRUE	No Hydrant	300	300	150	399	150	392	6014: 3891	TRUE
J-3822	479: Zone-Main	TRUE	No Hydrant	300	300	150	399	150	392	6014: 3891	TRUE
J-3823	479: Zone-Main	TRUE	No Hydrant	300	300	150	352	150	305	6014: 3891	TRUE
J-3824	479: Zone-Main	TRUE	No Hydrant	300	300	150	344	150	338	6014: 3891	TRUE
J-3825	479: Zone-Main	TRUE	No Hydrant	300	300	150	341	150	341	6014: 3891	TRUE
J-3826	479: Zone-Main	TRUE	No Hydrant	300	300	150	355	150	343	6014: 3891	TRUE
J-3827	479: Zone-Main	TRUE	No Hydrant	253	253	150	150	150	332	6014: 3891	TRUE
J-3829	479: Zone-Main	TRUE	No Hydrant	300	300	150	645	150	385	6014: 3891	TRUE
J-3830	479: Zone-Main	TRUE	No Hydrant	300	300	150	645	150	385	6014: 3891	TRUE
J-3831	479: Zone-Main	TRUE	No Hydrant	300	300	150	645	150	385	6014: 3891	TRUE
J-3832	479: Zone-Main	TRUE	No Hydrant	300	300	150	355	150	347	6014: 3891	TRUE
J-3834	479: Zone-Main	TRUE	No Hydrant	300	300	150	398	150	392	6014: 3891	TRUE
J-3855	479: Zone-Main	FALSE	225	84	84	150	157	150	150	6014: 3891	TRUE
J-3856	479: Zone-Main	FALSE	225	83	83	150	159	150	150	18071: J-3861	TRUE
J-3857	479: Zone-Main	TRUE	No Hydrant	82	82	150	163	150	150	18071: J-3861	TRUE
J-3858	479: Zone-Main	TRUE	No Hydrant	83	83	150	153	150	150	18071: J-3861	TRUE
J-3859	479: Zone-Main	TRUE	No Hydrant	83	83	150	156	150	150	18070: J-3860	TRUE
J-3860	479: Zone-Main	TRUE	No Hydrant	81	81	150	150	150	160	18071: J-3861	TRUE
J-3861	479: Zone-Main	TRUE	No Hydrant	81	81	150	150	150	162	18070: J-3860	TRUE
J-3862	479: Zone-Main	FALSE	225	113	113	150	150	150	202	18073: J-3863	TRUE
J-3863	479: Zone-Main	FALSE	225	120	120	150	158	150	150	18072: J-3862	TRUE
J-3864	479: Zone-Main	FALSE	225	131	132	150	159	150	150	18072: J-3862	TRUE
J-3865	479: Zone-Main	TRUE	No Hydrant	219	219	150	150	150	263	6014: 3891	TRUE
J-3870	479: Zone-Main	TRUE	No Hydrant	300	300	150	151	150	301	6014: 3891	TRUE
J-3871	479: Zone-Main	TRUE	No Hydrant	300	300	150	350	150	356	6014: 3891	TRUE
J-3881	479: Zone-Main	TRUE	No Hydrant	186	186	150	150	150	203	6014: 3891	TRUE
J-3887	479: Zone-Main	TRUE	No Hydrant	153	153	150	164	150	150	6014: 3891	TRUE
J-3888	479: Zone-Main	TRUE	No Hydrant	248	248	150	150	150	185	6014: 3891	TRUE
J-3890	479: Zone-Main	TRUE	No Hydrant	300	300	150	264	150	239	6014: 3891	TRUE

Table C2: Existing System Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-3891	479: Zone-Main	TRUE	No Hydrant	300	300	150	255	150	225	6014: 3891	TRUE
J-3892	479: Zone-Main	TRUE	No Hydrant	299	299	150	150	150	246	6014: 3891	TRUE
J-3893	479: Zone-Main	TRUE	No Hydrant	300	300	150	246	150	238	6014: 3891	TRUE
J-3894	479: Zone-Main	TRUE	No Hydrant	300	300	150	240	150	244	6014: 3891	TRUE
J-3895	479: Zone-Main	TRUE	No Hydrant	248	248	150	150	150	310	6014: 3891	TRUE
J-3896	479: Zone-Main	TRUE	No Hydrant	279	279	150	228	150	150	6014: 3891	TRUE
J-3897	479: Zone-Main	TRUE	No Hydrant	279	279	150	150	150	153	16598: J-3795	TRUE
J-3898	479: Zone-Main	TRUE	No Hydrant	281	281	150	150	150	152	16598: J-3795	TRUE
J-3899	479: Zone-Main	TRUE	No Hydrant	174	174	150	150	150	263	16598: J-3795	TRUE
J-39	479: Zone-Main	FALSE	225	132	132	150	150	150	195	561: J-38	TRUE
J-3900	479: Zone-Main	TRUE	No Hydrant	205	205	150	156	150	150	18341: J-3902	TRUE
J-3901	479: Zone-Main	TRUE	No Hydrant	179	179	150	150	150	215	18341: J-3902	TRUE
J-3902	479: Zone-Main	TRUE	No Hydrant	194	194	150	150	150	180	18337: J-3900	TRUE
J-3903	479: Zone-Main	TRUE	No Hydrant	205	205	150	173	150	150	6014: 3891	TRUE
J-3904	479: Zone-Main	TRUE	No Hydrant	192	192	150	150	150	211	6014: 3891	TRUE
J-3905	479: Zone-Main	TRUE	No Hydrant	201	201	150	150	150	153	6014: 3891	TRUE
J-3906	479: Zone-Main	TRUE	No Hydrant	207	207	150	174	150	150	6014: 3891	TRUE
J-3907	479: Zone-Main	TRUE	No Hydrant	300	300	150	296	150	286	6014: 3891	TRUE
J-3908	479: Zone-Main	TRUE	No Hydrant	262	262	150	150	150	312	6014: 3891	TRUE
J-3909	479: Zone-Main	TRUE	No Hydrant	248	248	150	150	150	315	6014: 3891	TRUE
J-3910	479: Zone-Main	TRUE	No Hydrant	300	300	150	268	150	273	6014: 3891	TRUE
J-3911	479: Zone-Main	TRUE	No Hydrant	201	201	150	150	150	170	6014: 3891	TRUE
J-3914	479: Zone-Main	TRUE	No Hydrant	300	300	150	381	150	354	6014: 3891	TRUE
J-3915	479: Zone-Main	TRUE	No Hydrant	300	300	150	320	150	322	6014: 3891	TRUE
J-3916	479: Zone-Main	TRUE	No Hydrant	300	300	150	262	150	260	6014: 3891	TRUE
J-3933	479: Zone-Main	TRUE	No Hydrant	199	199	150	150	150	170	6014: 3891	TRUE
J-3936	479: Zone-Main	TRUE	No Hydrant	235	235	150	150	150	157	6014: 3891	TRUE
J-3937	479: Zone-Main	TRUE	No Hydrant	300	300	150	313	150	287	6014: 3891	TRUE
J-3943	479: Zone-Main	TRUE	No Hydrant	256	256	150	153	150	150	858: J-1444	TRUE
J-3956	479: Zone-Main	TRUE	No Hydrant	260	260	150	150	150	214	18530: J-3958	TRUE
J-3957	479: Zone-Main	TRUE	No Hydrant	300	300	150	268	150	266	6014: 3891	TRUE
J-3958	479: Zone-Main	TRUE	No Hydrant	254	254	150	150	150	227	18525: J-3956	TRUE
J-3959	479: Zone-Main	TRUE	No Hydrant	248	248	150	153	150	150	18536: J-3962	TRUE
J-3960	479: Zone-Main	TRUE	No Hydrant	193	193	150	150	150	239	18536: J-3962	TRUE
J-3961	479: Zone-Main	TRUE	No Hydrant	230	230	150	151	150	150	18536: J-3962	TRUE
J-3962	479: Zone-Main	TRUE	No Hydrant	186	186	150	150	150	223	18535: J-3961	TRUE
J-3963	479: Zone-Main	TRUE	No Hydrant	185	185	150	150	150	223	18536: J-3962	TRUE
J-3964	479: Zone-Main	TRUE	No Hydrant	198	198	150	150	150	214	18545: J-3965	TRUE
J-3965	479: Zone-Main	TRUE	No Hydrant	237	237	150	150	150	152	18543: J-3964	TRUE
J-3966	479: Zone-Main	TRUE	No Hydrant	300	300	150	314	150	297	6014: 3891	TRUE
J-3967	479: Zone-Main	TRUE	No Hydrant	270	270	150	150	150	183	18545: J-3965	TRUE
J-3968	479: Zone-Main	TRUE	No Hydrant	300	300	150	317	150	296	6014: 3891	TRUE
J-3969	479: Zone-Main	TRUE	No Hydrant	279	279	150	152	150	311	6014: 3891	TRUE
J-3970	479: Zone-Main	TRUE	No Hydrant	300	300	150	291	150	269	6014: 3891	TRUE
J-3971	479: Zone-Main	TRUE	No Hydrant	300	300	150	160	150	284	6014: 3891	TRUE
J-3974	479: Zone-Main	TRUE	185	300	300	150	500	150	359	6014: 3891	TRUE
J-3987	479: Zone-Main	TRUE	No Hydrant	300	300	150	343	150	343	6014: 3891	TRUE
J-3989	479: Zone-Main	TRUE	No Hydrant	80	80	150	150	150	392	6014: 3891	TRUE
J-40	479: Zone-Main	TRUE	No Hydrant	300	300	150	553	150	365	6014: 3891	TRUE
J-4004	479: Zone-Main	TRUE	No Hydrant	300	300	150	391	150	359	6014: 3891	TRUE
J-4008	479: Zone-Main	TRUE	No Hydrant	300	300	150	543	150	385	6014: 3891	TRUE
J-4014	479: Zone-Main	TRUE	No Hydrant	300	300	150	280	150	268	6014: 3891	TRUE
J-4034	479: Zone-Main	TRUE	No Hydrant	283	283	150	150	150	291	6014: 3891	TRUE
J-4035	479: Zone-Main	TRUE	No Hydrant	300	300	150	265	150	253	6014: 3891	TRUE
J-4036	479: Zone-Main	TRUE	No Hydrant	221	221	150	155	150	150	6014: 3891	TRUE
J-4037	479: Zone-Main	TRUE	No Hydrant	28	28	150	150	150	393	6014: 3891	TRUE
J-4039	479: Zone-Main	TRUE	225	300	300	150	257	150	256	6014: 3891	TRUE
J-4040	479: Zone-Main	TRUE	No Hydrant	300	300	150	282	150	279	6014: 3891	TRUE
J-4041	479: Zone-Main	TRUE	No Hydrant	300	300	150	279	150	284	6014: 3891	TRUE
J-4044	479: Zone-Main	TRUE	No Hydrant	119	119	150	150	150	201	3262: J-2388	TRUE
J-4045	479: Zone-Main	TRUE	No Hydrant	82	82	150	150	150	175	3262: J-2388	TRUE
J-4047	479: Zone-Main	TRUE	No Hydrant	282	282	150	150	150	253	6014: 3891	TRUE
J-4048	479: Zone-Main	TRUE	No Hydrant	79	79	150	150	150	392	6014: 3891	TRUE
J-4049	479: Zone-Main	TRUE	No Hydrant	300	300	150	495	150	359	6014: 3891	TRUE
J-4051	479: Zone-Main	TRUE	No Hydrant	300	300	150	163	150	238	6014: 3891	TRUE
J-4052	479: Zone-Main	TRUE	No Hydrant	300	300	150	248	150	245	6014: 3891	TRUE
J-4053	479: Zone-Main	TRUE	No Hydrant	300	300	150	168	150	248	6014: 3891	TRUE
J-4058	479: Zone-Main	TRUE	No Hydrant	300	300	150	322	150	319	6014: 3891	TRUE
J-4059	479: Zone-Main	TRUE	No Hydrant	300	300	150	268	150	268	6014: 3891	TRUE
J-4066	479: Zone-Main	TRUE	No Hydrant	172	172	150	150	150	150	19196: J-4067	TRUE
J-4067	479: Zone-Main	TRUE	No Hydrant	172	172	150	150	150	150	19194: J-4066	TRUE
J-4071	479: Zone-Main	TRUE	No Hydrant	300	300	150	261	150	268	6014: 3891	TRUE
J-41	479: Zone-Main	TRUE	No Hydrant	300	300	150	539	150	361	6014: 3891	TRUE
J-42	479: Zone-Main	TRUE	225	265	265	150	150	150	267	18195: HYD_275	TRUE
J-43	479: Zone-Main	FALSE	225	198	198	150	150	150	270	18053: HYD_303	TRUE
J-44	479: Zone-Main	TRUE	No Hydrant	300	300	150	382	150	291	6014: 3891	TRUE
J-45	479: Zone-Main	TRUE	225	231	232	150	150	150	248	18231: HYD_279	TRUE
J-46	479: Zone-Main	TRUE	No Hydrant	275	275	150	150	150	158	6014: 3891	TRUE
J-47	479: Zone-Main	TRUE	225	300	300	150	303	150	243	18310: J-3888	TRUE
J-48	479: Zone-Main	TRUE	No Hydrant	300	300	150	343	150	222	6014: 3891	TRUE
J-49	479: Zone-Main	TRUE	225	228	229	150	171	150	150	2074: J-1999	TRUE
J-50	479: Zone-Main	TRUE	100	196	196	150	166	150	150	6014: 3891	TRUE
J-51	479: Zone-Main	FALSE	225	194	195	150	150	150	154	2074: J-1999	TRUE
J-52	479: Zone-Main	TRUE	225	300	300	150	306	150	314	6014: 3891	TRUE
J-54	479: Zone-Main	TRUE	225	300	300	150	470	150	355	6014: 3891	TRUE
J-55	479: Zone-Main	TRUE	225	300	300	150	391	150	356	6014: 3891	TRUE
J-56	479: Zone-Main	TRUE	225	300	301	150	447	150	347	6014: 3891	TRUE
J-57	479: Zone-Main	TRUE	225	300	301	150	431	150	352	6014: 3891	TRUE
J-58	479: Zone-Main	TRUE	No Hydrant	300	300	150	388	150	354	6014: 3891	TRUE
J-59	479: Zone-Main	TRUE	No Hydrant	300	300	150	382	150	355	6014: 3891	TRUE

Table C2: Existing System Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-60	479: Zone-Main	TRUE	No Hydrant	300	300	150	353	150	354	6014: 3891	TRUE
J-61	479: Zone-Main	TRUE	225	300	307	150	363	150	325	6834: 377340	TRUE
J-62	479: Zone-Main	TRUE	185	300	300	150	274	150	323	6014: 3891	TRUE
J-63	479: Zone-Main	TRUE	100	300	300	150	358	150	349	6014: 3891	TRUE
J-64	479: Zone-Main	TRUE	225	300	301	150	287	150	251	6834: 377340	TRUE
J-65	479: Zone-Main	FALSE	225	137	138	150	162	150	163	709: J-1108	TRUE
J-66	479: Zone-Main	TRUE	225	300	300	150	300	150	232	6834: 377340	TRUE
J-67	479: Zone-Main	TRUE	No Hydrant	238	238	150	150	150	170	6014: 3891	TRUE
J-68	479: Zone-Main	TRUE	225	282	282	150	150	150	177	554: J-272	TRUE
J-69	479: Zone-Main	FALSE	225	209	209	150	150	150	314	674: J-68	TRUE
J-7	479: Zone-Main	TRUE	No Hydrant	300	300	150	628	150	385	6014: 3891	TRUE
J-70	479: Zone-Main	TRUE	225	300	301	150	217	150	244	6834: 377340	TRUE
J-71	479: Zone-Main	TRUE	No Hydrant	300	300	150	290	150	285	6014: 3891	TRUE
J-72	479: Zone-Main	TRUE	225	300	300	150	216	150	256	3316: J-2406	TRUE
J-73	479: Zone-Main	TRUE	225	300	300	150	313	150	332	6834: 377340	TRUE
J-74	479: Zone-Main	TRUE	225	300	300	150	273	150	282	5951: 1680	TRUE
J-75	479: Zone-Main	TRUE	No Hydrant	300	300	150	319	150	322	6014: 3891	TRUE
J-76	479: Zone-Main	FALSE	225	173	174	150	150	150	272	1048: J-1880	TRUE
J-77	479: Zone-Main	TRUE	No Hydrant	300	300	150	322	150	320	6014: 3891	TRUE
J-78	479: Zone-Main	TRUE	225	300	300	150	327	150	322	6014: 3891	TRUE
J-79	479: Zone-Main	TRUE	225	300	302	150	241	150	278	6014: 3891	TRUE
J-8	479: Zone-Main	TRUE	No Hydrant	300	300	150	627	150	385	6014: 3891	TRUE
J-80	479: Zone-Main	TRUE	No Hydrant	300	300	150	210	150	291	6014: 3891	TRUE
J-81	479: Zone-Main	TRUE	No Hydrant	300	300	150	368	150	353	6014: 3891	TRUE
J-82	479: Zone-Main	TRUE	225	300	303	150	374	150	353	6014: 3891	TRUE
J-83	479: Zone-Main	TRUE	225	300	300	150	283	150	353	6014: 3891	TRUE
J-84	479: Zone-Main	TRUE	225	300	300	150	305	150	335	6014: 3891	TRUE
J-85	479: Zone-Main	TRUE	225	300	300	150	260	150	298	540: J-311	TRUE
J-86	479: Zone-Main	TRUE	225	300	301	150	355	150	354	6014: 3891	TRUE
J-87	479: Zone-Main	TRUE	225	300	300	150	380	150	354	6014: 3891	TRUE
J-88	479: Zone-Main	TRUE	225	300	301	150	387	150	361	6014: 3891	TRUE
J-9	479: Zone-Main	TRUE	No Hydrant	300	300	150	625.7	150	384	6014: 3891	TRUE
J-90	479: Zone-Main	TRUE	225	300	300.96	150	314.5	150	351.8	6014: 3891	TRUE
J-91	479: Zone-Main	TRUE	225	255.38	256.19	150	150	150	201.2	621: J-25	TRUE
J-92	479: Zone-Main	TRUE	225	300	300	150	307.4	150	345.7	6014: 3891	TRUE
J-93	479: Zone-Main	TRUE	No Hydrant	300	300	150	220.7	150	269.6	6014: 3891	TRUE
J-94	479: Zone-Main	TRUE	No Hydrant	288.69	288.69	150	150	150	162.7	6014: 3891	TRUE
J-95	479: Zone-Main	TRUE	225	279.97	280.43	150	150	150	218.6	891: J-1510	TRUE
J-96	479: Zone-Main	TRUE	225	270.88	271.47	150	150	150	271.5	607: J-95	TRUE
J-97	479: Zone-Main	TRUE	225	300	302.07	150	275.8	150	301.8	6014: 3891	TRUE
J-98	479: Zone-Main	TRUE	No Hydrant	300	300	150	294.5	150	295.9	6014: 3891	TRUE
J-99	479: Zone-Main	TRUE	225	300	300	150	248	150	308.1	3283: J-2395	TRUE

Note:

1. The maximum fire flow tested is 300 L/s. High fire flows may be possible if residual and zone pressures are still greater than 150 kPa when 300 L/s is reached.

Table C3: Existing System With Upgrades Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
1587	479: Zone-Main	TRUE	225	265	266	150	150	150	158	14696: J-3323	TRUE
1680	479: Zone-Main	TRUE	No Hydrant	78	78	150	150	150	392	6014: 3891	TRUE
1833	479: Zone-Main	TRUE	225	300	300	150	196	150	162	6834: 377340	TRUE
2955	479: Zone-Main	TRUE	No Hydrant	300	300	150	225	150	237	6014: 3891	TRUE
3018	479: Zone-Main	TRUE	225	265	265	150	170	150	150	5951: 1680	TRUE
3021	479: Zone-Main	TRUE	225	251	251	150	166	150	150	5951: 1680	TRUE
3144	479: Zone-Main	TRUE	225	226	227	150	165	150	150	7023: 393523	TRUE
3891	479: Zone-Main	TRUE	No Hydrant	300	300	150	270	150	278	18530: J-3958	TRUE
6363	479: Zone-Main	TRUE	No Hydrant	273	273	150	150	150	151	5948: 1587	TRUE
106989	479: Zone-Main	TRUE	225	300	300	150	256	150	277	6118: 107003	TRUE
107003	479: Zone-Main	TRUE	225	300	300	150	277	150	270	6116: 106989	TRUE
107051	479: Zone-Main	TRUE	225	300	301	150	297	150	283	6116: 106989	TRUE
107073	479: Zone-Main	TRUE	225	300	300	150	320	150	304	18536: J-3962	TRUE
107136	479: Zone-Main	TRUE	100	300	300	150	323	150	302	18536: J-3962	TRUE
110585	479: Zone-Main	FALSE	225	196	197	150	150	150	311	6014: 3891	TRUE
110603	479: Zone-Main	FALSE	225	185	186	150	150	150	155	6136: 110603	TRUE
110726	479: Zone-Main	TRUE	100	300	301	150	264	150	154	13252: J-2787	TRUE
110817	479: Zone-Main	TRUE	100	300	300	150	190	150	270	6014: 3891	TRUE
110821	479: Zone-Main	TRUE	No Hydrant	300	300	150	252	150	175	6014: 3891	TRUE
110827	479: Zone-Main	TRUE	100	192	193	150	158	150	237	6014: 3891	TRUE
111105	479: Zone-Main	TRUE	185	236	236	150	153	150	150	6192: 116421	TRUE
111115	479: Zone-Main	TRUE	100	183	183	150	150	150	150	6161: 111115	TRUE
111121	479: Zone-Main	TRUE	100	185	185	150	154	150	194	6014: 3891	TRUE
111123	479: Zone-Main	TRUE	No Hydrant	165	165	150	150	150	150	6165: 111123	TRUE
111129	479: Zone-Main	TRUE	185	195	195	150	150	150	208	6014: 3891	TRUE
111519	479: Zone-Main	TRUE	100	300	301	150	196	150	173	6165: 111123	TRUE
116132	479: Zone-Main	TRUE	No Hydrant	300	300	150	246	150	295	6014: 3891	TRUE
116323	479: Zone-Main	TRUE	100	300	300	150	188	150	233	6014: 3891	TRUE
116331	479: Zone-Main	TRUE	100	297	297	150	150	150	195	6014: 3891	TRUE
116355	479: Zone-Main	TRUE	100	245	245	150	160	150	187	6014: 3891	TRUE
116381	479: Zone-Main	TRUE	100	170	170	150	153	150	150	6192: 116421	TRUE
116421	479: Zone-Main	TRUE	100	170	170	150	150	150	150	6199: 117256	TRUE
116465	479: Zone-Main	TRUE	100	298	298	150	150	150	201	6199: 117256	TRUE
117256	479: Zone-Main	TRUE	100	154	154	150	150	150	167	6014: 3891	TRUE
121664	479: Zone-Main	TRUE	225	300	300	150	219	150	195	6187: 116381	TRUE
127105	479: Zone-Main	TRUE	100	202	203	150	150	150	244	6371: 158061	TRUE
134621	479: Zone-Main	TRUE	100	300	300	150	186	150	267	6014: 3891	TRUE
149113	479: Zone-Main	TRUE	No Hydrant	300	300	150	213	150	182	2393: J-2128	TRUE
149174	479: Zone-Main	TRUE	100	300	300	150	237	150	229	6014: 3891	TRUE
157379	479: Zone-Main	TRUE	100	275	276	150	150	150	227	6014: 3891	TRUE
158061	479: Zone-Main	TRUE	225	238	238	150	150	150	174	6014: 3891	TRUE
158622	479: Zone-Main	TRUE	100	270	270	150	150	150	282	16591: J-3792	TRUE
158655	479: Zone-Main	TRUE	100	229	229	150	150	150	151	6014: 3891	TRUE
158661	479: Zone-Main	TRUE	100	218	218	150	150	150	252	6014: 3891	TRUE
158948	479: Zone-Main	TRUE	100	298	298	150	152	150	231	6014: 3891	TRUE
158958	479: Zone-Main	TRUE	100	286	286	150	150	150	150	6014: 3891	TRUE
166366	479: Zone-Main	TRUE	100	300	300	150	196	150	170	6014: 3891	TRUE
166368	479: Zone-Main	TRUE	100	300	300	150	260	150	260	6014: 3891	TRUE
166379	479: Zone-Main	TRUE	100	300	300	150	156	150	259	6014: 3891	TRUE
166395	479: Zone-Main	TRUE	100	300	300	150	247	150	200	2393: J-2128	TRUE
166491	479: Zone-Main	TRUE	100	300	300	150	254	150	253	6014: 3891	TRUE
167243	479: Zone-Main	TRUE	225	300	300	150	169	150	271	6014: 3891	TRUE
186795	479: Zone-Main	TRUE	225	300	300	150	221	150	198	6834: 377340	TRUE
186797	479: Zone-Main	TRUE	No Hydrant	238	238	150	152	150	218	6371: 158061	TRUE
187566	479: Zone-Main	TRUE	225	226	226	150	150	150	150	6014: 3891	TRUE
187588	479: Zone-Main	TRUE	225	231	231	150	150	150	159	16393: J-3721	TRUE
187660	479: Zone-Main	TRUE	225	228	228	150	150	150	150	6651: 188078	TRUE
187778	479: Zone-Main	TRUE	No Hydrant	210	210	150	150	150	156	13184: J-2762	TRUE
187780	479: Zone-Main	TRUE	No Hydrant	203	203	150	150	150	172	6014: 3891	TRUE
188078	479: Zone-Main	TRUE	No Hydrant	230	230	150	150	150	176	6014: 3891	TRUE
366501	479: Zone-Main	TRUE	225	300	300	150	238	150	155	6014: 3891	TRUE
366751	479: Zone-Main	TRUE	225	300	301	150	210	150	217	6834: 377340	TRUE
366769	479: Zone-Main	TRUE	No Hydrant	300	300	150	188	150	216	6834: 377340	TRUE
366848	479: Zone-Main	TRUE	225	300	301	150	156	150	212	6014: 3891	TRUE
369028	479: Zone-Main	TRUE	225	262	262	150	152	150	205	6834: 377340	TRUE
369034	479: Zone-Main	TRUE	No Hydrant	269	269	150	155	150	150	12899: J-2669	TRUE
369038	479: Zone-Main	TRUE	225	289	289	150	150	150	150	6014: 3891	TRUE
369042	479: Zone-Main	TRUE	225	300	300	150	189	150	151	18310: J-3888	TRUE
369044	479: Zone-Main	TRUE	No Hydrant	300	300	150	214	150	150	18310: J-3888	TRUE
369046	479: Zone-Main	TRUE	225	300	300	150	213	150	153	6014: 3891	TRUE
369052	479: Zone-Main	TRUE	225	300	300	150	219	150	153	18310: J-3888	TRUE
369094	479: Zone-Main	TRUE	225	300	300	150	217	150	153	18310: J-3888	TRUE
369098	479: Zone-Main	TRUE	225	300	300	150	214	150	153	18310: J-3888	TRUE
369316	479: Zone-Main	TRUE	225	300	300	150	172	150	159	18310: J-3888	TRUE
369364	479: Zone-Main	TRUE	225	293	293	150	150	150	172	18310: J-3888	TRUE
369723	479: Zone-Main	TRUE	100	288	288	150	155	150	150	18310: J-3888	TRUE
369727	479: Zone-Main	TRUE	100	285	286	150	155	150	150	16598: J-3795	TRUE
370154	479: Zone-Main	TRUE	100	178	178	150	150	150	150	16598: J-3795	TRUE
370405	479: Zone-Main	TRUE	100	199	199	150	152	150	154	14065: J-3122	TRUE
372282	479: Zone-Main	TRUE	No Hydrant	211	211	150	150	150	150	6731: 370154	TRUE
377338	479: Zone-Main	TRUE	225	295	295	150	153	150	256	6834: 377340	TRUE
377340	479: Zone-Main	FALSE	225	211	212	150	150	150	150	6834: 377340	TRUE
377460	479: Zone-Main	TRUE	No Hydrant	220	220	150	160	150	177	6841: 377460	TRUE
377669	479: Zone-Main	TRUE	No Hydrant	287	287	150	150	150	150	6834: 377340	TRUE
377798	479: Zone-Main	TRUE	No Hydrant	295	295	150	168	150	157	16598: J-3795	TRUE
379439	479: Zone-Main	TRUE	100	292	292	150	150	150	150	6834: 377340	TRUE
379449	479: Zone-Main	TRUE	100	290	290	150	158	150	153	16598: J-3795	TRUE
380208	479: Zone-Main	TRUE	100	291	291	150	153	150	150	16598: J-3795	TRUE
381224	479: Zone-Main	TRUE	100	293	294	150	150	150	150	16598: J-3795	TRUE

Table C3: Existing System With Upgrades Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure @ Total Flow Needed)	Is Fire Flow Run Balanced?
390267	479: Zone-Main	FALSE	225	78	78	150	150	150	212	16288: J-3708	TRUE
390344	479: Zone-Main	FALSE	225	79	79	150	150	150	202	7007: 390267	TRUE
393420	479: Zone-Main	TRUE	No Hydrant	212	212	150	153	150	150	6014: 3891	TRUE
393471	479: Zone-Main	FALSE	225	194	195	150	153	150	150	7023: 393523	TRUE
393483	479: Zone-Main	FALSE	225	175	175	150	150	150	185	7023: 393523	TRUE
393523	479: Zone-Main	TRUE	No Hydrant	182	182	150	150	150	150	6014: 3891	TRUE
398098	479: Zone-Main	TRUE	185	300	300	150	345	150	357	6014: 3891	TRUE
398161	479: Zone-Main	TRUE	No Hydrant	300	300	150	341	150	325	6014: 3891	TRUE
398225	479: Zone-Main	TRUE	185	300	301	150	338	150	340	6014: 3891	TRUE
398555	479: Zone-Main	TRUE	185	300	301	150	250	150	245	6014: 3891	TRUE
398639	479: Zone-Main	TRUE	185	300	300	150	281	150	300	6014: 3891	TRUE
398721	479: Zone-Main	TRUE	100	300	300	150	337	150	352	6014: 3891	TRUE
398794	479: Zone-Main	TRUE	100	300	301	150	262	150	319	6014: 3891	TRUE
399184	479: Zone-Main	TRUE	100	300	300	150	315	150	338	6014: 3891	TRUE
399697	479: Zone-Main	TRUE	100	300	300	150	278	150	317	6014: 3891	TRUE
399781	479: Zone-Main	TRUE	100	300	300	150	318	150	340	6014: 3891	TRUE
399812	479: Zone-Main	TRUE	185	300	300	150	353	150	353	6014: 3891	TRUE
399839	479: Zone-Main	TRUE	No Hydrant	300	300	150	378	150	351	6014: 3891	TRUE
HYD_113	479: Zone-Main	TRUE	No Hydrant	221	221	150	150	150	241	6014: 3891	TRUE
HYD_114	479: Zone-Main	TRUE	No Hydrant	204	204	150	150	150	255	6014: 3891	TRUE
HYD_208	479: Zone-Main	TRUE	100	280	280	150	150	150	192	6014: 3891	TRUE
HYD_226	479: Zone-Main	TRUE	No Hydrant	158	158	150	150	150	338	6014: 3891	TRUE
HYD_262	479: Zone-Main	TRUE	100	257	257	150	150	150	289	6014: 3891	TRUE
HYD_275	479: Zone-Main	TRUE	225	245	245	150	155	150	150	7023: 393523	TRUE
HYD_279	479: Zone-Main	TRUE	No Hydrant	214	214	150	150	150	293	6014: 3891	TRUE
HYD_303	479: Zone-Main	TRUE	No Hydrant	210	210	150	150	150	312	6014: 3891	TRUE
HYD_304	479: Zone-Main	TRUE	No Hydrant	231	231	150	150	150	162	6014: 3891	TRUE
HYD_305	479: Zone-Main	TRUE	No Hydrant	278	278	150	150	150	202	6014: 3891	TRUE
HYD_306	479: Zone-Main	TRUE	No Hydrant	221	221	150	150	150	273	6014: 3891	TRUE
HYD_35	479: Zone-Main	TRUE	225	249	249	150	150	150	150	16646: J-3815	TRUE
HYD_410P	479: Zone-Main	TRUE	No Hydrant	235	235	150	150	150	150	6014: 3891	TRUE
HYD_411	479: Zone-Main	TRUE	No Hydrant	260	260	150	150	150	216	6014: 3891	TRUE
HYD_434	479: Zone-Main	TRUE	100	208	208	150	150	150	305	6014: 3891	TRUE
HYD_435	479: Zone-Main	TRUE	No Hydrant	300	300	150	349	150	332	6014: 3891	TRUE
HYD_44	479: Zone-Main	TRUE	No Hydrant	300	300	150	494	150	357	6014: 3891	TRUE
HYD_45	479: Zone-Main	TRUE	No Hydrant	202	202	150	150	150	261	6014: 3891	TRUE
HYD_495	479: Zone-Main	TRUE	No Hydrant	300	300	150	278	150	217	6014: 3891	TRUE
HYD_542	479: Zone-Main	TRUE	No Hydrant	300	300	150	279	150	215	6014: 3891	TRUE
HYD_602	479: Zone-Main	TRUE	No Hydrant	300	300	150	330	150	317	6014: 3891	TRUE
HYD_625	479: Zone-Main	TRUE	No Hydrant	300	300	150	197	150	237	6014: 3891	TRUE
HYD_627	479: Zone-Main	TRUE	No Hydrant	272	272	150	150	150	158	6014: 3891	TRUE
HYD_727	479: Zone-Main	TRUE	No Hydrant	170	170	150	158	150	150	6014: 3891	TRUE
HYD_728	479: Zone-Main	TRUE	185	207	207	150	158	150	150	1057: J-1878	TRUE
HYD_766	479: Zone-Main	TRUE	No Hydrant	300	300	150	376	150	229	6014: 3891	TRUE
HYD_808	479: Zone-Main	TRUE	No Hydrant	300	300	150	287	150	300	6014: 3891	TRUE
HYD_830	479: Zone-Main	TRUE	No Hydrant	216	216	150	151	150	150	6014: 3891	TRUE
HYD_84	479: Zone-Main	TRUE	No Hydrant	300	300	150	329	150	353	6014: 3891	TRUE
HYD_85	479: Zone-Main	TRUE	No Hydrant	300	300	150	241	150	282	6014: 3891	TRUE
HYD_9	479: Zone-Main	TRUE	No Hydrant	300	300	150	150	150	384	6014: 3891	TRUE
J-10	479: Zone-Main	TRUE	225	300	301	150	610	150	384	6014: 3891	TRUE
J-100	479: Zone-Main	TRUE	225	300	300	150	247	150	298	603: J-101	TRUE
J-101	479: Zone-Main	TRUE	225	300	300	150	255	150	282	856: J-1440	TRUE
J-102	479: Zone-Main	TRUE	100	300	300	150	282	150	296	6014: 3891	TRUE
J-103	479: Zone-Main	TRUE	No Hydrant	300	300	150	365	150	343	6014: 3891	TRUE
J-104	479: Zone-Main	TRUE	225	300	300	150	317	150	331	2393: J-2128	TRUE
J-105	479: Zone-Main	TRUE	225	287	287	150	150	150	179	758: J-1216	TRUE
J-106	479: Zone-Main	TRUE	225	266	267	150	150	150	240	799: J-1300	TRUE
J-107	479: Zone-Main	TRUE	185	299	300	150	150	150	272	793: J-1288	TRUE
J-108	479: Zone-Main	TRUE	225	270	270	150	150	150	250	793: J-1288	TRUE
J-109	479: Zone-Main	TRUE	225	300	301	150	252	150	326	2393: J-2128	TRUE
J-11	479: Zone-Main	TRUE	No Hydrant	300	300	150	568	150	384	6014: 3891	TRUE
J-110	479: Zone-Main	TRUE	100	300	300	150	303	150	326	6014: 3891	TRUE
J-1100	479: Zone-Main	TRUE	225	300	300	150	280	150	219	6834: 377340	TRUE
J-1102	479: Zone-Main	TRUE	225	300	300	150	278	150	217	6834: 377340	TRUE
J-1104	479: Zone-Main	TRUE	225	300	301	150	289	150	207	6834: 377340	TRUE
J-1106	479: Zone-Main	TRUE	225	300	302	150	227	150	218	6834: 377340	TRUE
J-1108	479: Zone-Main	TRUE	225	300	302	150	152	150	225	6834: 377340	TRUE
J-111	479: Zone-Main	TRUE	100	300	300	150	326	150	327	6014: 3891	TRUE
J-1110	479: Zone-Main	TRUE	100	300	300	150	339	150	323	6014: 3891	TRUE
J-1112	479: Zone-Main	TRUE	No Hydrant	300	300	150	350	150	321	6014: 3891	TRUE
J-1114	479: Zone-Main	TRUE	100	300	300	150	234	150	235	6014: 3891	TRUE
J-1116	479: Zone-Main	TRUE	100	300	300	150	154	150	184	6014: 3891	TRUE
J-1118	479: Zone-Main	TRUE	100	279	279	150	150	150	222	6014: 3891	TRUE
J-112	479: Zone-Main	TRUE	100	300	301	150	318	150	335	6014: 3891	TRUE
J-1120	479: Zone-Main	TRUE	100	284	284	150	150	150	166	6014: 3891	TRUE
J-1122	479: Zone-Main	TRUE	100	230	230	150	150	150	235	6014: 3891	TRUE
J-1124	479: Zone-Main	TRUE	100	242	242	150	150	150	208	716: J-1122	TRUE
J-1126	479: Zone-Main	TRUE	100	295	296	150	150	150	161	6014: 3891	TRUE
J-1128	479: Zone-Main	TRUE	100	298	298	150	155	150	150	6014: 3891	TRUE
J-113	479: Zone-Main	TRUE	225	300	300	150	314	150	333	2393: J-2128	TRUE
J-1130	479: Zone-Main	TRUE	100	300	300	150	242	150	239	6014: 3891	TRUE
J-1132	479: Zone-Main	TRUE	100	300	300	150	359	150	321	6014: 3891	TRUE
J-1134	479: Zone-Main	TRUE	100	295	296	150	150	150	261	6014: 3891	TRUE
J-1136	479: Zone-Main	TRUE	100	198	198	150	150	150	286	6014: 3891	TRUE
J-1138	479: Zone-Main	TRUE	100	219	219	150	150	150	314	6014: 3891	TRUE
J-114	479: Zone-Main	TRUE	225	300	300	150	338	150	331	2393: J-2128	TRUE
J-1140	479: Zone-Main	TRUE	No Hydrant	300	300	150	365	150	321	6014: 3891	TRUE
J-1142	479: Zone-Main	TRUE	No Hydrant	300	300	150	366	150	325	6014: 3891	TRUE
J-1146	479: Zone-Main	TRUE	225	279	280	150	150	150	320	6014: 3891	TRUE
J-1148	479: Zone-Main	TRUE	100	300	300	150	244	150	293	6014: 3891	TRUE

Table C3: Existing System With Upgrades Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-115	479: Zone-Main	TRUE	225	300	300	150	349	150	331	2393: J-2128	TRUE
J-1150	479: Zone-Main	TRUE	100	300	300	150	380	150	331	6014: 3891	TRUE
J-1152	479: Zone-Main	TRUE	100	300	300	150	224	150	241	6014: 3891	TRUE
J-1154	479: Zone-Main	TRUE	100	300	300	150	289	150	286	6014: 3891	TRUE
J-1156	479: Zone-Main	TRUE	100	285	286	150	150	150	262	6014: 3891	TRUE
J-1158	479: Zone-Main	TRUE	100	300	300	150	157	150	228	6014: 3891	TRUE
J-116	479: Zone-Main	TRUE	225	300	300	150	351	150	331	2393: J-2128	TRUE
J-1160	479: Zone-Main	TRUE	No Hydrant	300	300	150	372	150	328	6014: 3891	TRUE
J-1162	479: Zone-Main	TRUE	100	184	185	150	150	150	364	6014: 3891	TRUE
J-1164	479: Zone-Main	TRUE	No Hydrant	300	300	150	299	150	313	6014: 3891	TRUE
J-1168	479: Zone-Main	TRUE	100	300	301	150	285	150	297	6014: 3891	TRUE
J-117	479: Zone-Main	TRUE	No Hydrant	300	300	150	322	150	315	6014: 3891	TRUE
J-1170	479: Zone-Main	TRUE	100	267	267	150	150	150	222	6014: 3891	TRUE
J-1172	479: Zone-Main	TRUE	100	300	300	150	263	150	290	6014: 3891	TRUE
J-1174	479: Zone-Main	TRUE	100	276	276	150	150	150	204	6014: 3891	TRUE
J-1176	479: Zone-Main	TRUE	225	300	301	150	278	150	288	2393: J-2128	TRUE
J-1178	479: Zone-Main	TRUE	100	300	300	150	263	150	287	6014: 3891	TRUE
J-118	479: Zone-Main	TRUE	100	300	300	150	347	150	332	6014: 3891	TRUE
J-1180	479: Zone-Main	TRUE	225	300	300	150	223	150	251	6228: 121664	TRUE
J-1182	479: Zone-Main	TRUE	100	136	136	150	160	150	150	2405: J-2133	TRUE
J-1184	479: Zone-Main	TRUE	100	125	125	150	154	150	150	16442: J-3730	TRUE
J-119	479: Zone-Main	TRUE	100	300	300	150	351	150	332	6014: 3891	TRUE
J-1190	479: Zone-Main	TRUE	225	300	302	150	337	150	324	6014: 3891	TRUE
J-1192	479: Zone-Main	TRUE	185	300	300	150	338	150	322	6014: 3891	TRUE
J-1194	479: Zone-Main	TRUE	225	300	301	150	194	150	185	6090: 6363	TRUE
J-1196	479: Zone-Main	TRUE	No Hydrant	300	300	150	338	150	325	6014: 3891	TRUE
J-1198	479: Zone-Main	TRUE	No Hydrant	300	300	150	388	150	334	6014: 3891	TRUE
J-12	479: Zone-Main	TRUE	No Hydrant	300	300	150	566	150	384	6014: 3891	TRUE
J-120	479: Zone-Main	TRUE	No Hydrant	300	300	150	226	150	306	6014: 3891	TRUE
J-1200	479: Zone-Main	TRUE	No Hydrant	300	300	150	395	150	342	6014: 3891	TRUE
J-1202	479: Zone-Main	TRUE	100	300	300	150	316	150	325	6014: 3891	TRUE
J-1204	479: Zone-Main	TRUE	100	300	300	150	264	150	278	6014: 3891	TRUE
J-1206	479: Zone-Main	TRUE	225	300	301	150	288	150	317	6192: 116421	TRUE
J-121	479: Zone-Main	TRUE	100	300	300	150	218	150	267	6014: 3891	TRUE
J-1210	479: Zone-Main	TRUE	100	246	246	150	150	150	247	6014: 3891	TRUE
J-1212	479: Zone-Main	TRUE	100	262	262	150	150	150	210	6014: 3891	TRUE
J-1214	479: Zone-Main	TRUE	225	282	283	150	150	150	212	3271: J-2391	TRUE
J-1216	479: Zone-Main	TRUE	No Hydrant	154	154	150	150	150	359	6014: 3891	TRUE
J-1218	479: Zone-Main	TRUE	225	245	246	150	150	150	329	803: J-1308	TRUE
J-122	479: Zone-Main	TRUE	No Hydrant	300	300	150	345	150	332	6014: 3891	TRUE
J-1220	479: Zone-Main	TRUE	225	243	244	150	190	150	321	3307: J-2403	TRUE
J-1222	479: Zone-Main	TRUE	225	300	301	150	150	150	252	518: J-299	TRUE
J-1224	479: Zone-Main	TRUE	185	201	201	150	159	150	150	16458: J-3737	TRUE
J-1226	479: Zone-Main	TRUE	225	300	301	150	262	150	268	2407: J-2134	TRUE
J-1228	479: Zone-Main	TRUE	225	286	286	150	150	150	243	790: J-1282	TRUE
J-123	479: Zone-Main	TRUE	No Hydrant	300	300	150	300	150	328	6014: 3891	TRUE
J-1230	479: Zone-Main	TRUE	185	300	301	150	235	150	285	6014: 3891	TRUE
J-1232	479: Zone-Main	TRUE	100	300	300	150	257	150	341	6014: 3891	TRUE
J-1234	479: Zone-Main	TRUE	100	300	301	150	287	150	355	6014: 3891	TRUE
J-1236	479: Zone-Main	TRUE	No Hydrant	300	300	150	201	150	279	6014: 3891	TRUE
J-1238	479: Zone-Main	TRUE	No Hydrant	270	270	150	150	150	158	6014: 3891	TRUE
J-124	479: Zone-Main	TRUE	No Hydrant	300	300	150	336	150	333	6014: 3891	TRUE
J-1240	479: Zone-Main	TRUE	225	290	291	150	150	150	159	3211: J-2371	TRUE
J-1242	479: Zone-Main	TRUE	No Hydrant	298	298	150	150	150	184	6014: 3891	TRUE
J-1244	479: Zone-Main	TRUE	225	251	251	150	150	150	225	769: J-1238	TRUE
J-1246	479: Zone-Main	TRUE	225	300	301	150	439	150	356	6014: 3891	TRUE
J-1248	479: Zone-Main	TRUE	185	300	300	150	408	150	356	6014: 3891	TRUE
J-125	479: Zone-Main	TRUE	No Hydrant	191	191	150	150	150	323	6014: 3891	TRUE
J-1250	479: Zone-Main	TRUE	185	300	300	150	402	150	356	6014: 3891	TRUE
J-1252	479: Zone-Main	TRUE	225	300	301	150	496	150	384	6014: 3891	TRUE
J-1254	479: Zone-Main	TRUE	185	300	300	150	378	150	379	6014: 3891	TRUE
J-1256	479: Zone-Main	TRUE	225	300	301	150	463	150	384	6014: 3891	TRUE
J-1258	479: Zone-Main	TRUE	185	300	301	150	388	150	384	6014: 3891	TRUE
J-1260	479: Zone-Main	TRUE	225	300	300	150	424	150	359	6014: 3891	TRUE
J-1262	479: Zone-Main	TRUE	No Hydrant	300	300	150	462	150	356	6014: 3891	TRUE
J-1264	479: Zone-Main	TRUE	225	300	300	150	465	150	356	6014: 3891	TRUE
J-1266	479: Zone-Main	TRUE	225	300	300	150	300	150	352	6014: 3891	TRUE
J-1268	479: Zone-Main	TRUE	225	300	301	150	160	150	162	16646: J-3815	TRUE
J-127	479: Zone-Main	TRUE	225	300	300	150	253	150	271	6014: 3891	TRUE
J-1270	479: Zone-Main	TRUE	185	300	301	150	369	150	354	6014: 3891	TRUE
J-1272	479: Zone-Main	TRUE	100	151	152	150	163	150	323	6014: 3891	TRUE
J-1276	479: Zone-Main	TRUE	185	228	229	150	150	150	307	6014: 3891	TRUE
J-1278	479: Zone-Main	TRUE	225	300	300	150	384	150	355	6014: 3891	TRUE
J-128	479: Zone-Main	TRUE	225	228	229	150	150	150	152	16382: J-3719	TRUE
J-1280	479: Zone-Main	TRUE	100	168	168	150	150	150	303	6014: 3891	TRUE
J-1282	479: Zone-Main	TRUE	100	159	160	150	150	150	207	3319: J-2407	TRUE
J-1284	479: Zone-Main	TRUE	100	168	168	150	150	150	295	6014: 3891	TRUE
J-1286	479: Zone-Main	TRUE	100	300	300	150	239	150	278	6014: 3891	TRUE
J-1288	479: Zone-Main	TRUE	225	266	266	150	150	150	253	599: J-108	TRUE
J-129	479: Zone-Main	TRUE	225	227	227	150	150	150	166	16382: J-3719	TRUE
J-1290	479: Zone-Main	TRUE	185	233	234	150	150	150	193	800: J-1302	TRUE
J-1292	479: Zone-Main	TRUE	100	179	180	150	150	150	311	6014: 3891	TRUE
J-1294	479: Zone-Main	TRUE	100	166	166	150	150	150	295	6014: 3891	TRUE
J-1296	479: Zone-Main	TRUE	225	253	253	150	150	150	289	601: J-105	TRUE
J-1298	479: Zone-Main	TRUE	100	179	180	150	150	150	231	3295: J-2399	TRUE
J-13	479: Zone-Main	TRUE	No Hydrant	300	300	150	512	150	384	6014: 3891	TRUE
J-130	479: Zone-Main	TRUE	No Hydrant	179	179	150	150	150	301	6014: 3891	TRUE
J-1300	479: Zone-Main	TRUE	185	189	190	150	150	150	168	3274: J-2392	TRUE
J-1302	479: Zone-Main	TRUE	185	200	200	150	150	150	209	799: J-1300	TRUE
J-1304	479: Zone-Main	TRUE	100	256	256	150	150	150	213	6014: 3891	TRUE

Table C3: Existing System With Upgrades Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-1306	479: Zone-Main	TRUE	100	300	300	150	246	150	267	6014: 3891	TRUE
J-1308	479: Zone-Main	TRUE	100	190	190	150	150	150	228	6014: 3891	TRUE
J-1310	479: Zone-Main	TRUE	225	232	232	150	150	150	158	15905: J-3659	TRUE
J-1310	479: Zone-Main	TRUE	No Hydrant	300	300	150	297	150	288	6014: 3891	TRUE
J-1312	479: Zone-Main	TRUE	225	300	300	150	337	150	328	2393: J-2128	TRUE
J-132	479: Zone-Main	TRUE	225	234	235	150	150	150	155	18020: HYD_410P	TRUE
J-133	479: Zone-Main	TRUE	225	300	300	150	259	150	266	6014: 3891	TRUE
J-1338	479: Zone-Main	TRUE	100	300	300	150	273	150	289	6014: 3891	TRUE
J-134	479: Zone-Main	TRUE	No Hydrant	300	300	150	342	150	356	6014: 3891	TRUE
J-1340	479: Zone-Main	TRUE	100	300	301	150	219	150	274	6014: 3891	TRUE
J-1342	479: Zone-Main	TRUE	100	300	300	150	232	150	272	6014: 3891	TRUE
J-1344	479: Zone-Main	TRUE	100	300	300	150	267	150	245	2393: J-2128	TRUE
J-1348	479: Zone-Main	TRUE	100	300	300	150	220	150	198	2393: J-2128	TRUE
J-135	479: Zone-Main	TRUE	No Hydrant	300	300	150	408	150	356	6014: 3891	TRUE
J-1350	479: Zone-Main	TRUE	100	300	300	150	203	150	194	2393: J-2128	TRUE
J-1352	479: Zone-Main	TRUE	100	300	300	150	200	150	187	2393: J-2128	TRUE
J-1354	479: Zone-Main	TRUE	100	217	218	150	150	150	153	2393: J-2128	TRUE
J-1356	479: Zone-Main	TRUE	100	239	240	150	150	150	209	2393: J-2128	TRUE
J-1358	479: Zone-Main	TRUE	100	300	301	150	200	150	228	6014: 3891	TRUE
J-136	479: Zone-Main	TRUE	185	300	300	150	404	150	356	6014: 3891	TRUE
J-1360	479: Zone-Main	TRUE	100	300	300	150	248	150	274	6014: 3891	TRUE
J-1366	479: Zone-Main	TRUE	100	300	300	150	324	150	316	6014: 3891	TRUE
J-1368	479: Zone-Main	TRUE	100	300	300	150	321	150	314	6014: 3891	TRUE
J-137	479: Zone-Main	TRUE	185	300	300	150	386	150	356	6014: 3891	TRUE
J-1372	479: Zone-Main	TRUE	225	300	300	150	355	150	316	6014: 3891	TRUE
J-1374	479: Zone-Main	TRUE	No Hydrant	300	300	150	334	150	316	6014: 3891	TRUE
J-1376	479: Zone-Main	TRUE	225	300	300	150	283	150	285	6014: 3891	TRUE
J-1378	479: Zone-Main	TRUE	100	300	301	150	197	150	269	6014: 3891	TRUE
J-138	479: Zone-Main	TRUE	225	296	297	150	150	150	226	6014: 3891	TRUE
J-1380	479: Zone-Main	TRUE	100	300	300	150	211	150	258	6014: 3891	TRUE
J-1382	479: Zone-Main	TRUE	No Hydrant	300	300	150	337	150	324	6014: 3891	TRUE
J-1384	479: Zone-Main	TRUE	185	300	300	150	309	150	314	6014: 3891	TRUE
J-1386	479: Zone-Main	TRUE	100	300	300	150	274	150	281	6014: 3891	TRUE
J-1388	479: Zone-Main	TRUE	100	300	300	150	342	150	323	6014: 3891	TRUE
J-139	479: Zone-Main	TRUE	No Hydrant	300	300	150	381	150	356	6014: 3891	TRUE
J-1390	479: Zone-Main	TRUE	185	300	300	150	261	150	297	6014: 3891	TRUE
J-1392	479: Zone-Main	TRUE	225	300	301	150	341	150	319	6014: 3891	TRUE
J-1394	479: Zone-Main	FALSE	225	141	141	150	150	150	260	858: J-1444	TRUE
J-1396	479: Zone-Main	TRUE	100	300	300	150	246	150	252	6014: 3891	TRUE
J-1398	479: Zone-Main	TRUE	185	300	300	150	331	150	286	6192: 116421	TRUE
J-14	479: Zone-Main	TRUE	225	300	300	150	508	150	358	6014: 3891	TRUE
J-140	479: Zone-Main	TRUE	No Hydrant	300	300	150	375	150	355	6014: 3891	TRUE
J-1400	479: Zone-Main	TRUE	225	300	302	150	336	150	296	6192: 116421	TRUE
J-1402	479: Zone-Main	TRUE	No Hydrant	300	300	150	343	150	315	6014: 3891	TRUE
J-1404	479: Zone-Main	TRUE	100	292	292	150	150	150	204	6014: 3891	TRUE
J-1406	479: Zone-Main	TRUE	100	300	300	150	193	150	223	6014: 3891	TRUE
J-1408	479: Zone-Main	TRUE	100	247	247	150	150	150	150	6014: 3891	TRUE
J-141	479: Zone-Main	TRUE	225	300	301	150	395	150	356	6014: 3891	TRUE
J-1410	479: Zone-Main	TRUE	185	300	300	150	232	150	269	6014: 3891	TRUE
J-1412	479: Zone-Main	TRUE	100	300	301	150	174	150	270	6014: 3891	TRUE
J-1414	479: Zone-Main	TRUE	100	300	300	150	382	150	346	6014: 3891	TRUE
J-1416	479: Zone-Main	TRUE	100	225	225	150	150	150	279	6014: 3891	TRUE
J-1418	479: Zone-Main	TRUE	No Hydrant	250	250	150	150	150	321	6014: 3891	TRUE
J-142	479: Zone-Main	TRUE	No Hydrant	300	300	150	398	150	356	6014: 3891	TRUE
J-1420	479: Zone-Main	TRUE	100	242	243	150	150	150	241	6014: 3891	TRUE
J-1422	479: Zone-Main	TRUE	185	300	301	150	260	150	259	2199: J-2052	TRUE
J-1424	479: Zone-Main	TRUE	225	300	300	150	341	150	310	6014: 3891	TRUE
J-1426	479: Zone-Main	TRUE	100	173	173	150	150	150	364	6014: 3891	TRUE
J-1428	479: Zone-Main	TRUE	100	300	300	150	291	150	265	2393: J-2128	TRUE
J-143	479: Zone-Main	TRUE	No Hydrant	286	286	150	150	150	313	6014: 3891	TRUE
J-1430	479: Zone-Main	TRUE	100	270	270	150	150	150	163	6014: 3891	TRUE
J-1432	479: Zone-Main	TRUE	100	300	300	150	340	150	332	6014: 3891	TRUE
J-1434	479: Zone-Main	TRUE	100	184	184	150	150	150	208	19112: J-4044	TRUE
J-1436	479: Zone-Main	TRUE	100	158	158	150	150	150	229	19112: J-4044	TRUE
J-1438	479: Zone-Main	TRUE	No Hydrant	300	300	150	261	150	296	6014: 3891	TRUE
J-144	479: Zone-Main	TRUE	100	300	300	150	271	150	319	6014: 3891	TRUE
J-1440	479: Zone-Main	TRUE	100	300	300	150	231	150	270	6014: 3891	TRUE
J-1442	479: Zone-Main	TRUE	100	205	206	150	150	150	204	6014: 3891	TRUE
J-1444	479: Zone-Main	FALSE	225	183	185	150	150	150	153	19194: J-4066	TRUE
J-1446	479: Zone-Main	TRUE	225	300	300	150	183	150	209	3316: J-2406	TRUE
J-1448	479: Zone-Main	TRUE	185	300	300	150	200	150	251	6014: 3891	TRUE
J-145	479: Zone-Main	TRUE	No Hydrant	300	300	150	223	150	245	6014: 3891	TRUE
J-1450	479: Zone-Main	TRUE	185	300	300	150	278	150	280	6014: 3891	TRUE
J-1452	479: Zone-Main	TRUE	185	272	272	150	150	150	325	6014: 3891	TRUE
J-1454	479: Zone-Main	TRUE	100	285	285	150	150	150	208	6014: 3891	TRUE
J-1456	479: Zone-Main	TRUE	100	300	300	150	153	150	170	6014: 3891	TRUE
J-1458	479: Zone-Main	TRUE	No Hydrant	239	239	150	155	150	150	6014: 3891	TRUE
J-146	479: Zone-Main	TRUE	No Hydrant	286	286	150	423	150	283	6014: 3891	TRUE
J-1460	479: Zone-Main	TRUE	No Hydrant	300	300	150	387	150	358	6014: 3891	TRUE
J-1462	479: Zone-Main	TRUE	225	300	300	150	155	150	359	6014: 3891	TRUE
J-1464	479: Zone-Main	TRUE	100	188	188	150	155	150	150	6014: 3891	TRUE
J-1466	479: Zone-Main	TRUE	100	141	142	150	155	150	180	870: J-1468	TRUE
J-1468	479: Zone-Main	TRUE	100	135	135	150	150	150	236	869: J-1466	TRUE
J-147	479: Zone-Main	TRUE	185	300	300	150	170	150	226	6014: 3891	TRUE
J-1470	479: Zone-Main	TRUE	100	194	194	150	150	150	201	6014: 3891	TRUE
J-1472	479: Zone-Main	TRUE	100	186	186	150	150	150	180	6014: 3891	TRUE
J-1474	479: Zone-Main	TRUE	No Hydrant	300	300	150	177	150	257	6014: 3891	TRUE
J-1476	479: Zone-Main	TRUE	100	145	145	150	154	150	150	16444: J-3731	TRUE
J-1478	479: Zone-Main	TRUE	No Hydrant	300	300	150	239	150	271	6014: 3891	TRUE
J-148	479: Zone-Main	TRUE	225	279	279	150	150	150	267	2281: J-2089	TRUE

Table C3: Existing System With Upgrades Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-1480	479: Zone-Main	TRUE	100	300	300	150	195	150	195	6014: 3891	TRUE
J-1482	479: Zone-Main	TRUE	100	300	300	150	289	150	320	6014: 3891	TRUE
J-1484	479: Zone-Main	TRUE	100	300	300	150	247	150	242	6014: 3891	TRUE
J-1486	479: Zone-Main	TRUE	100	300	300	150	257	150	253	6014: 3891	TRUE
J-1488	479: Zone-Main	TRUE	No Hydrant	300	300	150	299	150	326	6014: 3891	TRUE
J-149	479: Zone-Main	TRUE	185	300	301	150	211	150	275	6014: 3891	TRUE
J-1490	479: Zone-Main	TRUE	100	300	300	150	176	150	184	6014: 3891	TRUE
J-1492	479: Zone-Main	TRUE	100	173	173	150	158	150	150	6014: 3891	TRUE
J-1494	479: Zone-Main	TRUE	100	136	136	150	165	150	150	16479: J-3747	TRUE
J-1496	479: Zone-Main	TRUE	100	146	146	150	152	150	150	16477: J-3746	TRUE
J-1498	479: Zone-Main	TRUE	100	275	275	150	150	150	196	6014: 3891	TRUE
J-15	479: Zone-Main	TRUE	No Hydrant	300	300	150	467	150	357	6014: 3891	TRUE
J-150	479: Zone-Main	TRUE	No Hydrant	300	300	150	195	150	285	6014: 3891	TRUE
J-1500	479: Zone-Main	TRUE	100	173	174	150	150	150	351	6014: 3891	TRUE
J-1502	479: Zone-Main	TRUE	No Hydrant	300	300	150	248	150	264	6014: 3891	TRUE
J-1504	479: Zone-Main	TRUE	No Hydrant	300	300	150	375	150	354	6014: 3891	TRUE
J-1506	479: Zone-Main	TRUE	225	300	301	150	331	150	353	6014: 3891	TRUE
J-1508	479: Zone-Main	TRUE	225	300	300	150	295	150	310	16643: J-3814	TRUE
J-151	479: Zone-Main	TRUE	100	270	270	150	150	150	262	6014: 3891	TRUE
J-1510	479: Zone-Main	TRUE	100	238	238	150	150	150	192	6014: 3891	TRUE
J-1512	479: Zone-Main	TRUE	100	239	239	150	150	150	176	6014: 3891	TRUE
J-1514	479: Zone-Main	TRUE	100	157	157	150	150	150	226	3298: J-2400	TRUE
J-1516	479: Zone-Main	TRUE	100	172	172	150	150	150	186	3298: J-2400	TRUE
J-1518	479: Zone-Main	TRUE	100	300	300	150	322	150	332	6014: 3891	TRUE
J-152	479: Zone-Main	TRUE	225	293	293	150	150	150	159	577: J-155	TRUE
J-1520	479: Zone-Main	TRUE	185	300	301	150	291	150	335	6014: 3891	TRUE
J-1522	479: Zone-Main	TRUE	100	182	183	150	150	150	358	6014: 3891	TRUE
J-1524	479: Zone-Main	TRUE	100	300	300	150	332	150	344	6014: 3891	TRUE
J-1526	479: Zone-Main	TRUE	225	276	276	150	150	150	357	6014: 3891	TRUE
J-1528	479: Zone-Main	TRUE	225	300	300	150	235	150	182	6834: 377340	TRUE
J-153	479: Zone-Main	TRUE	100	292	293	150	150	150	207	6014: 3891	TRUE
J-1530	479: Zone-Main	TRUE	No Hydrant	300	300	150	277	150	311	6014: 3891	TRUE
J-1532	479: Zone-Main	TRUE	225	300	300	150	321	150	311	499: J-322	TRUE
J-1534	479: Zone-Main	TRUE	225	300	302	150	288	150	299	16288: J-3708	TRUE
J-1536	479: Zone-Main	FALSE	225	92	92	150	150	150	154	7011: 390344	TRUE
J-1538	479: Zone-Main	TRUE	No Hydrant	99	99	150	150	150	278	16288: J-3708	TRUE
J-154	479: Zone-Main	TRUE	100	274	274	150	150	150	212	6014: 3891	TRUE
J-155	479: Zone-Main	TRUE	No Hydrant	295	295	150	150	150	152	6014: 3891	TRUE
J-156	479: Zone-Main	TRUE	100	296	296	150	150	150	214	6014: 3891	TRUE
J-157	479: Zone-Main	TRUE	100	254	254	150	150	150	152	6014: 3891	TRUE
J-158	479: Zone-Main	FALSE	225	175	175	150	154	150	150	2405: J-2133	TRUE
J-1584	479: Zone-Main	TRUE	225	300	302	150	328	150	195	18310: J-3888	TRUE
J-159	479: Zone-Main	TRUE	100	272	272	150	150	150	187	6014: 3891	TRUE
J-16	479: Zone-Main	TRUE	No Hydrant	300	300	150	480	150	357	6014: 3891	TRUE
J-160	479: Zone-Main	TRUE	No Hydrant	238	238	150	150	150	160	6014: 3891	TRUE
J-161	479: Zone-Main	TRUE	100	208	209	150	150	150	190	857: J-1442	TRUE
J-1628	479: Zone-Main	TRUE	225	300	302	150	284	150	210	18310: J-3888	TRUE
J-1632	479: Zone-Main	TRUE	No Hydrant	300	300	150	263	150	163	6014: 3891	TRUE
J-1656	479: Zone-Main	TRUE	No Hydrant	277	277	150	153	150	150	6090: 6363	TRUE
J-168	479: Zone-Main	TRUE	225	300	301	150	203	150	328	6014: 3891	TRUE
J-169	479: Zone-Main	TRUE	No Hydrant	300	300	150	370	150	224	6014: 3891	TRUE
J-17	479: Zone-Main	TRUE	225	300	301	150	379	150	356	6014: 3891	TRUE
J-170	479: Zone-Main	TRUE	225	300	302	150	331	150	209	18310: J-3888	TRUE
J-1750	479: Zone-Main	TRUE	No Hydrant	226	226	150	150	150	207	6014: 3891	TRUE
J-1798	479: Zone-Main	TRUE	No Hydrant	248	248	150	154	150	150	858: J-1444	TRUE
J-18	479: Zone-Main	TRUE	225	300	300	150	422	150	355	6014: 3891	TRUE
J-182	479: Zone-Main	TRUE	225	300	301	150	150	150	276	6014: 3891	TRUE
J-184	479: Zone-Main	TRUE	No Hydrant	300	300	150	382	150	357	6014: 3891	TRUE
J-185	479: Zone-Main	TRUE	No Hydrant	202	202	150	150	150	270	6014: 3891	TRUE
J-186	479: Zone-Main	TRUE	No Hydrant	300	300	150	337	150	332	6014: 3891	TRUE
J-1866	479: Zone-Main	TRUE	100	204	204	150	160	150	150	6014: 3891	TRUE
J-1868	479: Zone-Main	TRUE	100	165	166	150	157	150	150	1057: J-1878	TRUE
J-1878	479: Zone-Main	TRUE	100	148	148	150	150	150	218	1056: J-1868	TRUE
J-188	479: Zone-Main	TRUE	No Hydrant	300	300	150	272	150	259	6014: 3891	TRUE
J-1880	479: Zone-Main	TRUE	No Hydrant	300	300	150	240	150	273	6014: 3891	TRUE
J-19	479: Zone-Main	TRUE	No Hydrant	277	277	150	150	150	173	6014: 3891	TRUE
J-1900	479: Zone-Main	TRUE	100	300	300	150	312	150	299	6014: 3891	TRUE
J-1902	479: Zone-Main	TRUE	185	300	300	150	250	150	268	6192: 116421	TRUE
J-1904	479: Zone-Main	TRUE	185	256	257	150	150	150	180	1057: J-1878	TRUE
J-1906	479: Zone-Main	TRUE	185	300	301	150	168	150	243	6192: 116421	TRUE
J-1908	479: Zone-Main	TRUE	100	300	301	150	169	150	251	6014: 3891	TRUE
J-1910	479: Zone-Main	TRUE	100	300	300	150	279	150	275	6014: 3891	TRUE
J-1912	479: Zone-Main	TRUE	185	231	232	150	150	150	334	6192: 116421	TRUE
J-1914	479: Zone-Main	TRUE	185	300	301	150	329	150	299	6192: 116421	TRUE
J-1916	479: Zone-Main	TRUE	100	300	300	150	323	150	299	6014: 3891	TRUE
J-1918	479: Zone-Main	TRUE	225	300	300	150	610	150	384	6014: 3891	TRUE
J-1920	479: Zone-Main	TRUE	185	214	215	150	150	150	150	2274: J-2086	TRUE
J-1930	479: Zone-Main	TRUE	185	254	254	150	150	150	153	1103: J-1978	TRUE
J-1932	479: Zone-Main	TRUE	185	263	254	150	150	150	151	1110: J-1994	TRUE
J-194	479: Zone-Main	TRUE	No Hydrant	300	300	150	323	150	319	6014: 3891	TRUE
J-196	479: Zone-Main	TRUE	100	242	242	150	150	150	225	6014: 3891	TRUE
J-1974	479: Zone-Main	TRUE	No Hydrant	235	235	150	150	150	173	6014: 3891	TRUE
J-1978	479: Zone-Main	TRUE	185	243	243	150	150	150	161	1104: J-1980	TRUE
J-1980	479: Zone-Main	TRUE	185	235	235	150	150	150	160	1106: J-1984	TRUE
J-1982	479: Zone-Main	TRUE	No Hydrant	212	212	150	150	150	205	6014: 3891	TRUE
J-1984	479: Zone-Main	TRUE	185	230	230	150	150	150	175	2262: J-2082	TRUE
J-1988	479: Zone-Main	TRUE	No Hydrant	276	276	150	150	150	180	6014: 3891	TRUE
J-1992	479: Zone-Main	TRUE	No Hydrant	201	201	150	150	150	189	6014: 3891	TRUE
J-1994	479: Zone-Main	TRUE	185	252	252	150	150	150	154	1103: J-1978	TRUE
J-1996	479: Zone-Main	TRUE	No Hydrant	252	252	150	152	150	150	6014: 3891	TRUE

Table C3: Existing System With Upgrades Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-1998	479: Zone-Main	TRUE	225	300	301	150	162	150	181	561: J-38	TRUE
J-1999	479: Zone-Main	TRUE	No Hydrant	228	228	150	150	150	190	6014: 3891	TRUE
J-200	479: Zone-Main	TRUE	225	300	301	150	414	150	355	6014: 3891	TRUE
J-2001	479: Zone-Main	TRUE	185	296	296	150	150	150	285	2393: J-2128	TRUE
J-2002	479: Zone-Main	TRUE	No Hydrant	290	290	150	208	150	150	6014: 3891	TRUE
J-2003	479: Zone-Main	TRUE	225	300	301	150	377	150	228	18310: J-3888	TRUE
J-2004	479: Zone-Main	TRUE	No Hydrant	300	300	150	195	150	188	6014: 3891	TRUE
J-2004	479: Zone-Main	TRUE	225	297	298	150	150	150	185	18310: J-3888	TRUE
J-2005	479: Zone-Main	TRUE	225	289	290	150	150	150	177	18310: J-3888	TRUE
J-2006	479: Zone-Main	TRUE	100	300	300	150	285	150	298	6014: 3891	TRUE
J-2008	479: Zone-Main	TRUE	No Hydrant	300	300	150	335	150	321	6014: 3891	TRUE
J-2009	479: Zone-Main	TRUE	185	300	300	150	300	150	308	6014: 3891	TRUE
J-2010	479: Zone-Main	TRUE	No Hydrant	300	300	150	238	150	243	6014: 3891	TRUE
J-2011	479: Zone-Main	TRUE	185	243	243	150	150	150	212	2103: J-2012	TRUE
J-2012	479: Zone-Main	TRUE	185	230	230	150	150	150	229	2101: J-2011	TRUE
J-2013	479: Zone-Main	TRUE	No Hydrant	300	300	150	236	150	248	6014: 3891	TRUE
J-2014	479: Zone-Main	TRUE	100	300	301	150	258	150	279	6014: 3891	TRUE
J-2015	479: Zone-Main	TRUE	100	300	300	150	263	150	279	6014: 3891	TRUE
J-2016	479: Zone-Main	TRUE	185	285	286	150	150	150	284	2114: J-2017	TRUE
J-2017	479: Zone-Main	TRUE	185	300	300	150	238	150	263	2112: J-2016	TRUE
J-2018	479: Zone-Main	TRUE	185	300	301	150	295	150	298	6014: 3891	TRUE
J-2019	479: Zone-Main	TRUE	185	300	300	150	188	150	270	2114: J-2017	TRUE
J-2020	479: Zone-Main	TRUE	100	300	300	150	246	150	274	6014: 3891	TRUE
J-2021	479: Zone-Main	TRUE	100	300	300	150	175	150	282	6014: 3891	TRUE
J-2022	479: Zone-Main	TRUE	No Hydrant	300	300	150	326	150	315	6014: 3891	TRUE
J-2023	479: Zone-Main	TRUE	100	300	300	150	324	150	318	6014: 3891	TRUE
J-2024	479: Zone-Main	TRUE	225	300	300	150	327	150	319	6014: 3891	TRUE
J-2025	479: Zone-Main	TRUE	100	300	301	150	331	150	320	6014: 3891	TRUE
J-2026	479: Zone-Main	TRUE	100	300	300	150	193	150	296	6014: 3891	TRUE
J-2027	479: Zone-Main	TRUE	185	300	300	150	282	150	294	6014: 3891	TRUE
J-2028	479: Zone-Main	TRUE	100	300	300	150	180	150	236	6014: 3891	TRUE
J-2029	479: Zone-Main	TRUE	100	274	275	150	150	150	264	6014: 3891	TRUE
J-2030	479: Zone-Main	TRUE	100	300	300	150	171	150	238	6014: 3891	TRUE
J-2031	479: Zone-Main	TRUE	100	300	301	150	238	150	218	2393: J-2128	TRUE
J-2032	479: Zone-Main	TRUE	100	286	286	150	150	150	162	2163: J-2036	TRUE
J-2033	479: Zone-Main	TRUE	100	290	290	150	150	150	172	2163: J-2036	TRUE
J-2034	479: Zone-Main	TRUE	100	289	269	150	150	150	187	2163: J-2036	TRUE
J-2035	479: Zone-Main	TRUE	100	289	270	150	150	150	160	2163: J-2036	TRUE
J-2036	479: Zone-Main	TRUE	100	206	206	150	150	150	193	2165: J-2037	TRUE
J-2037	479: Zone-Main	TRUE	100	197	197	150	150	150	202	2163: J-2036	TRUE
J-2038	479: Zone-Main	TRUE	100	201	201	150	150	150	194	2165: J-2037	TRUE
J-2039	479: Zone-Main	TRUE	No Hydrant	150	150	150	150	150	189	905: J-1538	TRUE
J-2041	479: Zone-Main	TRUE	225	300	300	150	212	150	214	499: J-322	TRUE
J-2042	479: Zone-Main	TRUE	100	249	249	150	150	150	200	6014: 3891	TRUE
J-2043	479: Zone-Main	TRUE	100	258	258	150	150	150	183	6014: 3891	TRUE
J-2044	479: Zone-Main	TRUE	100	300	300	150	241	150	242	6014: 3891	TRUE
J-2047	479: Zone-Main	TRUE	100	248	248	150	150	150	162	6014: 3891	TRUE
J-2048	479: Zone-Main	TRUE	100	253	253	150	150	150	174	6014: 3891	TRUE
J-2049	479: Zone-Main	TRUE	100	199	199	150	150	150	169	2195: J-2050	TRUE
J-205	479: Zone-Main	TRUE	No Hydrant	300	300	150	331	150	324	6014: 3891	TRUE
J-2050	479: Zone-Main	TRUE	100	184	185	150	150	150	173	2197: J-2051	TRUE
J-2051	479: Zone-Main	TRUE	100	177	178	150	150	150	195	2199: J-2052	TRUE
J-2052	479: Zone-Main	TRUE	100	178	178	150	150	150	192	2197: J-2051	TRUE
J-2053	479: Zone-Main	TRUE	100	186	186	150	150	150	166	2199: J-2052	TRUE
J-2054	479: Zone-Main	TRUE	100	202	203	150	150	150	163	2199: J-2052	TRUE
J-2055	479: Zone-Main	TRUE	100	241	241	150	150	150	161	6014: 3891	TRUE
J-2056	479: Zone-Main	TRUE	No Hydrant	281	281	150	151	150	150	6014: 3891	TRUE
J-2057	479: Zone-Main	TRUE	No Hydrant	229	229	150	150	150	218	6014: 3891	TRUE
J-2058	479: Zone-Main	TRUE	185	300	300	150	329	150	285	6192: 116421	TRUE
J-2059	479: Zone-Main	TRUE	100	300	300	150	316	150	280	6014: 3891	TRUE
J-2060	479: Zone-Main	TRUE	100	300	300	150	309	150	271	6014: 3891	TRUE
J-2061	479: Zone-Main	TRUE	100	300	300	150	286	150	258	6014: 3891	TRUE
J-2062	479: Zone-Main	TRUE	100	300	301	150	275	150	252	6014: 3891	TRUE
J-2063	479: Zone-Main	TRUE	100	300	300	150	309	150	275	6014: 3891	TRUE
J-2064	479: Zone-Main	TRUE	100	286	287	150	155	150	150	6014: 3891	TRUE
J-2065	479: Zone-Main	TRUE	No Hydrant	273	273	150	160	150	150	6014: 3891	TRUE
J-2066	479: Zone-Main	TRUE	100	277	277	150	158	150	150	6014: 3891	TRUE
J-2067	479: Zone-Main	TRUE	100	300	300	150	259	150	241	6014: 3891	TRUE
J-2068	479: Zone-Main	TRUE	185	222	224	150	161	150	150	2259: J-2080	TRUE
J-2069	479: Zone-Main	TRUE	100	151	151	150	157	150	150	2259: J-2080	TRUE
J-2070	479: Zone-Main	FALSE	185	139	139	150	150	150	189	2259: J-2080	TRUE
J-2071	479: Zone-Main	TRUE	No Hydrant	300	300	150	343	150	294	6014: 3891	TRUE
J-2072	479: Zone-Main	TRUE	225	300	301	150	219	150	213	2251: J-2076	TRUE
J-2073	479: Zone-Main	TRUE	225	300	301	150	154	150	213	2251: J-2076	TRUE
J-2074	479: Zone-Main	TRUE	No Hydrant	219	219	150	153	150	150	6014: 3891	TRUE
J-2075	479: Zone-Main	TRUE	No Hydrant	182	182	150	150	150	150	6014: 3891	TRUE
J-2076	479: Zone-Main	TRUE	No Hydrant	106	106	150	150	150	365	6014: 3891	TRUE
J-2077	479: Zone-Main	TRUE	100	173	173	150	150	150	311	6014: 3891	TRUE
J-2078	479: Zone-Main	TRUE	100	170	170	150	150	150	312	6014: 3891	TRUE
J-2079	479: Zone-Main	TRUE	100	169	169	150	150	150	321	6014: 3891	TRUE
J-208	479: Zone-Main	TRUE	100	300	300	150	294	150	307	6014: 3891	TRUE
J-2080	479: Zone-Main	TRUE	100	126	126	150	150	150	232	2238: J-2070	TRUE
J-2082	479: Zone-Main	TRUE	185	227	228	150	150	150	181	1106: J-1984	TRUE
J-2083	479: Zone-Main	TRUE	185	253	253	150	150	150	175	2269: J-2084	TRUE
J-2084	479: Zone-Main	TRUE	185	207	208	150	150	150	171	1109: J-1992	TRUE
J-2085	479: Zone-Main	TRUE	100	142	142	150	150	150	230	1057: J-1878	TRUE
J-2086	479: Zone-Main	FALSE	185	152	152	150	150	150	299	1074: J-1920	TRUE
J-2087	479: Zone-Main	TRUE	100	240	240	150	150	150	171	6014: 3891	TRUE
J-2088	479: Zone-Main	TRUE	100	117	117	150	150	150	390	6014: 3891	TRUE
J-2089	479: Zone-Main	TRUE	225	229	230	150	150	150	180	2279: J-2088	TRUE

Table C3: Existing System With Upgrades Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-2090	479: Zone-Main	TRUE	100	280	280	150	150	150	180	6014: 3891	TRUE
J-2091	479: Zone-Main	TRUE	100	114	114	150	150	150	390	6014: 3891	TRUE
J-2092	479: Zone-Main	TRUE	185	269	270	150	150	150	193	2288: J-2091	TRUE
J-2093	479: Zone-Main	TRUE	100	288	288	150	150	150	260	6014: 3891	TRUE
J-2094	479: Zone-Main	TRUE	100	126	126	150	150	150	386	6014: 3891	TRUE
J-2095	479: Zone-Main	TRUE	185	251	252	150	150	150	267	6014: 3891	TRUE
J-2096	479: Zone-Main	TRUE	No Hydrant	300	300	150	307	150	311	6014: 3891	TRUE
J-2097	479: Zone-Main	TRUE	225	300	300	150	207	150	315	6014: 3891	TRUE
J-2098	479: Zone-Main	TRUE	225	300	301	150	285	150	320	2393: J-2128	TRUE
J-2099	479: Zone-Main	TRUE	225	300	300	150	180	150	289	6014: 3891	TRUE
J-21	479: Zone-Main	TRUE	No Hydrant	300	300	150	412	150	354	6014: 3891	TRUE
J-2100	479: Zone-Main	TRUE	100	130	131	150	150	150	386	6014: 3891	TRUE
J-2101	479: Zone-Main	TRUE	100	214	214	150	150	150	299	6014: 3891	TRUE
J-2102	479: Zone-Main	TRUE	100	174	175	150	150	150	359	6014: 3891	TRUE
J-2103	479: Zone-Main	TRUE	100	237	238	150	150	150	303	6014: 3891	TRUE
J-2105	479: Zone-Main	TRUE	225	300	300	150	189	150	286	6014: 3891	TRUE
J-2106	479: Zone-Main	TRUE	100	133	134	150	150	150	386	6014: 3891	TRUE
J-2107	479: Zone-Main	TRUE	225	270	270	150	150	150	183	527: J-292	TRUE
J-2108	479: Zone-Main	TRUE	100	195	196	150	150	150	359	6014: 3891	TRUE
J-2109	479: Zone-Main	TRUE	225	300	300	150	302	150	295	6014: 3891	TRUE
J-2110	479: Zone-Main	TRUE	225	270	270	150	150	150	222	2345: J-2111	TRUE
J-2111	479: Zone-Main	TRUE	225	266	267	150	150	150	235	2343: J-2110	TRUE
J-2112	479: Zone-Main	TRUE	225	300	300	150	259	150	271	6014: 3891	TRUE
J-2113	479: Zone-Main	TRUE	225	300	300	150	258	150	268	6014: 3891	TRUE
J-2114	479: Zone-Main	TRUE	225	300	301	150	421	150	356	6014: 3891	TRUE
J-2115	479: Zone-Main	TRUE	225	300	300	150	302	150	358	6014: 3891	TRUE
J-2116	479: Zone-Main	TRUE	100	163	163	150	150	150	385	6014: 3891	TRUE
J-2117	479: Zone-Main	TRUE	100	132	132	150	150	150	195	3283: J-2395	TRUE
J-2118	479: Zone-Main	TRUE	100	101	102	150	150	150	325	3283: J-2395	TRUE
J-2119	479: Zone-Main	TRUE	100	143	143	150	150	150	186	3283: J-2395	TRUE
J-2120	479: Zone-Main	TRUE	100	136	136	150	150	150	153	2374: J-2121	TRUE
J-2121	479: Zone-Main	TRUE	100	126	126	150	158	150	223	2371: J-2120	TRUE
J-2122	479: Zone-Main	TRUE	100	105	106	150	150	150	304	2374: J-2121	TRUE
J-2123	479: Zone-Main	TRUE	100	137	137	150	150	150	179	2376: J-2122	TRUE
J-2124	479: Zone-Main	TRUE	100	300	300	150	367	150	336	6014: 3891	TRUE
J-2125	479: Zone-Main	TRUE	100	300	301	150	263	150	353	6014: 3891	TRUE
J-2126	479: Zone-Main	TRUE	100	300	300	150	322	150	348	6014: 3891	TRUE
J-2127	479: Zone-Main	TRUE	100	214	214	150	150	150	153	2393: J-2128	TRUE
J-2128	479: Zone-Main	TRUE	100	169	169	150	150	150	188	16615: J-3802	TRUE
J-2130	479: Zone-Main	TRUE	225	300	300	150	505	150	358	6014: 3891	TRUE
J-2131	479: Zone-Main	TRUE	100	128	128	150	150	150	387	6014: 3891	TRUE
J-2133	479: Zone-Main	TRUE	100	118	118	150	150	150	251	16442: J-3730	TRUE
J-2134	479: Zone-Main	TRUE	No Hydrant	300	300	150	232	150	275	6014: 3891	TRUE
J-2135	479: Zone-Main	TRUE	No Hydrant	300	300	150	506	150	384	6014: 3891	TRUE
J-2136	479: Zone-Main	TRUE	No Hydrant	300	300	150	252	150	359	6014: 3891	TRUE
J-2137	479: Zone-Main	TRUE	185	300	306	150	341	150	383	6014: 3891	TRUE
J-2138	479: Zone-Main	TRUE	No Hydrant	300	300	150	487	150	358	6014: 3891	TRUE
J-2139	479: Zone-Main	TRUE	225	300	301	150	469	150	358	6014: 3891	TRUE
J-2141	479: Zone-Main	TRUE	No Hydrant	300	300	150	565	150	384	6014: 3891	TRUE
J-2142	479: Zone-Main	TRUE	225	300	300	150	565	150	384	6014: 3891	TRUE
J-2143	479: Zone-Main	TRUE	225	230	231	150	150	150	388	6014: 3891	TRUE
J-2152	479: Zone-Main	TRUE	No Hydrant	275	275	150	167	150	150	6014: 3891	TRUE
J-217	479: Zone-Main	TRUE	100	300	301	150	262	150	287	6014: 3891	TRUE
J-2230	479: Zone-Main	TRUE	No Hydrant	300	300	150	223	150	306	6014: 3891	TRUE
J-2280	479: Zone-Main	TRUE	No Hydrant	236	236	150	154	150	150	16598: J-3795	TRUE
J-23	479: Zone-Main	TRUE	225	300	301	150	406	150	354	6014: 3891	TRUE
J-2309	479: Zone-Main	TRUE	225	235	235	150	160	150	150	7023: 393523	TRUE
J-2319	479: Zone-Main	TRUE	No Hydrant	300	300	150	317	150	326	6014: 3891	TRUE
J-2320	479: Zone-Main	TRUE	225	300	301	150	347	150	335	2393: J-2128	TRUE
J-2321	479: Zone-Main	TRUE	225	300	301	150	232	150	278	6014: 3891	TRUE
J-2322	479: Zone-Main	TRUE	100	133	134	150	150	150	386	6014: 3891	TRUE
J-2323	479: Zone-Main	TRUE	225	300	300	150	225	150	277	6014: 3891	TRUE
J-2324	479: Zone-Main	TRUE	No Hydrant	229	229	150	150	150	165	6014: 3891	TRUE
J-2325	479: Zone-Main	TRUE	185	230	230	150	150	150	166	2997: J-2324	TRUE
J-2326	479: Zone-Main	TRUE	No Hydrant	298	298	150	150	150	290	6014: 3891	TRUE
J-2353	479: Zone-Main	TRUE	225	254	254	150	150	150	313	3162: J-2354	TRUE
J-2354	479: Zone-Main	TRUE	225	300	300	150	158	150	204	3159: J-2353	TRUE
J-2355	479: Zone-Main	TRUE	185	300	301	150	212	150	340	6014: 3891	TRUE
J-2356	479: Zone-Main	TRUE	185	300	300	150	237	150	330	6014: 3891	TRUE
J-2357	479: Zone-Main	TRUE	100	178	178	150	150	150	298	6014: 3891	TRUE
J-2358	479: Zone-Main	TRUE	100	127	127	150	150	150	314	6014: 3891	TRUE
J-2359	479: Zone-Main	TRUE	100	173	174	150	150	150	317	6014: 3891	TRUE
J-2360	479: Zone-Main	TRUE	100	126	126	150	150	150	322	6014: 3891	TRUE
J-2361	479: Zone-Main	TRUE	100	135	135	150	150	150	378	6014: 3891	TRUE
J-2362	479: Zone-Main	TRUE	100	166	166	150	150	150	260	6014: 3891	TRUE
J-2363	479: Zone-Main	TRUE	100	154	155	150	150	150	295	6014: 3891	TRUE
J-2364	479: Zone-Main	TRUE	185	197	198	150	150	150	354	6014: 3891	TRUE
J-2366	479: Zone-Main	TRUE	225	295	295	150	150	150	357	6014: 3891	TRUE
J-2367	479: Zone-Main	TRUE	225	300	301	150	167	150	356	6014: 3891	TRUE
J-2368	479: Zone-Main	TRUE	225	268	269	150	150	150	279	3208: J-2370	TRUE
J-2369	479: Zone-Main	TRUE	185	278	278	150	150	150	356	6014: 3891	TRUE
J-2370	479: Zone-Main	TRUE	100	293	293	150	150	150	250	6014: 3891	TRUE
J-2371	479: Zone-Main	TRUE	100	285	286	150	150	150	178	6014: 3891	TRUE
J-2372	479: Zone-Main	TRUE	225	300	301	150	468	150	357	6014: 3891	TRUE
J-2373	479: Zone-Main	TRUE	185	300	301	150	296	150	353	6014: 3891	TRUE
J-2374	479: Zone-Main	TRUE	225	300	301	150	339	150	346	6014: 3891	TRUE
J-2375	479: Zone-Main	TRUE	225	300	301	150	299	150	353	6014: 3891	TRUE
J-2376	479: Zone-Main	TRUE	No Hydrant	208	208	150	150	150	360	6014: 3891	TRUE
J-2377	479: Zone-Main	TRUE	No Hydrant	300	300	150	383	150	356	6014: 3891	TRUE
J-2378	479: Zone-Main	TRUE	225	300	301	150	327	150	356	6014: 3891	TRUE

Table C3: Existing System With Upgrades Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-2379	479: Zone-Main	TRUE	225	300	300	150	275	150	333	6014: 3891	TRUE
J-2380	479: Zone-Main	TRUE	No Hydrant	300	300	150	313	150	325	6014: 3891	TRUE
J-2381	479: Zone-Main	TRUE	185	300	301	150	315	150	316	6014: 3891	TRUE
J-2382	479: Zone-Main	TRUE	No Hydrant	242	242	150	150	150	169	6014: 3891	TRUE
J-2383	479: Zone-Main	TRUE	225	243	245	150	150	150	170	3244: J-2382	TRUE
J-2384	479: Zone-Main	TRUE	225	300	301	150	262	150	288	6014: 3891	TRUE
J-2385	479: Zone-Main	TRUE	225	300	300	150	270	150	334	6014: 3891	TRUE
J-2386	479: Zone-Main	TRUE	100	151	151	150	150	150	358	6014: 3891	TRUE
J-2387	479: Zone-Main	TRUE	100	112	113	150	150	150	389	6014: 3891	TRUE
J-2388	479: Zone-Main	TRUE	100	143	143	150	175	150	345	19115: J-4045	TRUE
J-2389	479: Zone-Main	TRUE	100	125	126	150	159	150	386	6014: 3891	TRUE
J-2390	479: Zone-Main	TRUE	100	178	179	150	150	150	357	6014: 3891	TRUE
J-2391	479: Zone-Main	TRUE	100	118	119	150	150	150	389	6014: 3891	TRUE
J-2392	479: Zone-Main	TRUE	100	148	148	150	150	150	258	799: J-1300	TRUE
J-2393	479: Zone-Main	TRUE	100	114	115	150	150	150	389	6014: 3891	TRUE
J-2394	479: Zone-Main	TRUE	225	300	300	150	164	150	292	533: J-317	TRUE
J-2395	479: Zone-Main	TRUE	100	108	108	150	150	150	311	2362: J-2117	TRUE
J-2396	479: Zone-Main	TRUE	100	127	127	150	150	150	360	6014: 3891	TRUE
J-2397	479: Zone-Main	TRUE	100	127	128	150	161	150	386	6014: 3891	TRUE
J-2398	479: Zone-Main	TRUE	100	107	108	150	150	150	390	6014: 3891	TRUE
J-2399	479: Zone-Main	TRUE	100	128	128	150	162	150	347	798: J-1298	TRUE
J-24	479: Zone-Main	TRUE	225	300	300	150	377	150	354	6014: 3891	TRUE
J-2400	479: Zone-Main	TRUE	100	128	129	150	150	150	315	893: J-1514	TRUE
J-2401	479: Zone-Main	TRUE	225	300	301	150	325	150	306	6192: 116421	TRUE
J-2402	479: Zone-Main	TRUE	225	300	302	150	351	150	319	6192: 116421	TRUE
J-2403	479: Zone-Main	TRUE	225	259	260	150	150	150	309	760: J-1220	TRUE
J-2404	479: Zone-Main	TRUE	225	300	301	150	240	150	340	6014: 3891	TRUE
J-2405	479: Zone-Main	TRUE	225	300	302	150	187	150	344	6014: 3891	TRUE
J-2406	479: Zone-Main	TRUE	100	137	138	150	150	150	386	6014: 3891	TRUE
J-2413	479: Zone-Main	TRUE	185	300	300	150	161	150	384	6014: 3891	TRUE
J-2414	479: Zone-Main	TRUE	225	300	301	150	430	150	359	6014: 3891	TRUE
J-2415	479: Zone-Main	TRUE	225	300	301	150	277	150	359	6014: 3891	TRUE
J-2416	479: Zone-Main	TRUE	225	300	301	150	191	150	266	18310: J-3888	TRUE
J-2419	479: Zone-Main	TRUE	185	243	243	150	150	150	359	6014: 3891	TRUE
J-2439	479: Zone-Main	TRUE	100	291	292	150	154	150	150	16598: J-3795	TRUE
J-2449	479: Zone-Main	TRUE	100	210	210	150	150	150	257	16598: J-3795	TRUE
J-25	479: Zone-Main	TRUE	No Hydrant	300	300	150	213	150	349	6014: 3891	TRUE
J-2536	479: Zone-Main	TRUE	100	213	213	150	150	150	252	16598: J-3795	TRUE
J-2539	479: Zone-Main	TRUE	100	222	222	150	150	150	239	16598: J-3795	TRUE
J-26	479: Zone-Main	TRUE	185	300	300	150	267	150	316	6014: 3891	TRUE
J-2669	479: Zone-Main	TRUE	No Hydrant	231	231	150	150	150	215	6014: 3891	TRUE
J-267	479: Zone-Main	TRUE	No Hydrant	300	300	150	400	150	358	6014: 3891	TRUE
J-268	479: Zone-Main	TRUE	No Hydrant	300	300	150	400	150	358	6014: 3891	TRUE
J-269	479: Zone-Main	TRUE	No Hydrant	300	300	150	404	150	358	6014: 3891	TRUE
J-27	479: Zone-Main	TRUE	225	300	301	150	359	150	346	6014: 3891	TRUE
J-270	479: Zone-Main	TRUE	225	300	300	150	347	150	383	6014: 3891	TRUE
J-271	479: Zone-Main	TRUE	225	300	300	150	289	150	348	6014: 3891	TRUE
J-272	479: Zone-Main	TRUE	No Hydrant	258	258	150	150	150	243	6014: 3891	TRUE
J-2721	479: Zone-Main	TRUE	No Hydrant	260	260	150	150	150	162	6014: 3891	TRUE
J-273	479: Zone-Main	TRUE	185	300	300	150	445	150	356	6014: 3891	TRUE
J-2731	479: Zone-Main	TRUE	No Hydrant	287	287	150	152	150	150	16598: J-3795	TRUE
J-274	479: Zone-Main	TRUE	No Hydrant	300	300	150	384	150	354	6014: 3891	TRUE
J-275	479: Zone-Main	TRUE	100	214	214	150	150	150	194	6014: 3891	TRUE
J-276	479: Zone-Main	TRUE	225	271	272	150	150	150	183	870: J-1468	TRUE
J-2762	479: Zone-Main	TRUE	225	227	227	150	150	150	152	6635: 187778	TRUE
J-2766	479: Zone-Main	TRUE	100	300	300	150	319	150	307	6014: 3891	TRUE
J-2787	479: Zone-Main	FALSE	225	176	176	150	150	150	204	6136: 110603	TRUE
J-28	479: Zone-Main	TRUE	225	300	300	150	360	150	321	6192: 116421	TRUE
J-280	479: Zone-Main	TRUE	No Hydrant	300	300	150	549	150	383	6014: 3891	TRUE
J-281	479: Zone-Main	TRUE	No Hydrant	300	300	150	561	150	384	6014: 3891	TRUE
J-282	479: Zone-Main	TRUE	No Hydrant	300	300	150	510	150	384	6014: 3891	TRUE
J-283	479: Zone-Main	TRUE	225	300	300	150	439	150	359	6014: 3891	TRUE
J-284	479: Zone-Main	TRUE	No Hydrant	300	300	150	437	150	359	6014: 3891	TRUE
J-285	479: Zone-Main	TRUE	No Hydrant	300	300	150	502	150	358	6014: 3891	TRUE
J-286	479: Zone-Main	TRUE	No Hydrant	283	283	150	150	150	238	6014: 3891	TRUE
J-2865	479: Zone-Main	TRUE	100	292	292	150	156	150	150	16598: J-3795	TRUE
J-287	479: Zone-Main	TRUE	225	300	301	150	416	150	356	6014: 3891	TRUE
J-288	479: Zone-Main	TRUE	No Hydrant	300	300	150	403	150	356	6014: 3891	TRUE
J-289	479: Zone-Main	TRUE	No Hydrant	300	300	150	389	150	354	6014: 3891	TRUE
J-29	479: Zone-Main	TRUE	185	267	268	150	150	150	188	520: J-298	TRUE
J-290	479: Zone-Main	TRUE	225	248	249	150	150	150	356	6014: 3891	TRUE
J-291	479: Zone-Main	TRUE	No Hydrant	300	300	150	154	150	285	6014: 3891	TRUE
J-292	479: Zone-Main	TRUE	100	275	276	150	150	150	172	6014: 3891	TRUE
J-293	479: Zone-Main	TRUE	225	300	300	150	157	150	265	6014: 3891	TRUE
J-294	479: Zone-Main	TRUE	No Hydrant	194	194	150	150	150	358	6014: 3891	TRUE
J-295	479: Zone-Main	TRUE	225	264	264	150	150	150	293	522: J-294	TRUE
J-296	479: Zone-Main	TRUE	No Hydrant	300	300	150	186	150	282	6014: 3891	TRUE
J-297	479: Zone-Main	TRUE	No Hydrant	300	300	150	294	150	342	6014: 3891	TRUE
J-298	479: Zone-Main	TRUE	185	241	243	150	150	150	244	582: J-29	TRUE
J-299	479: Zone-Main	TRUE	100	272	272	150	150	150	267	6014: 3891	TRUE
J-30	479: Zone-Main	TRUE	No Hydrant	257	257	150	150	150	190	6014: 3891	TRUE
J-300	479: Zone-Main	TRUE	185	263	264	150	150	150	173	517: J-302	TRUE
J-301	479: Zone-Main	TRUE	100	288	288	150	150	150	243	6014: 3891	TRUE
J-302	479: Zone-Main	TRUE	100	265	266	150	150	150	178	6014: 3891	TRUE
J-303	479: Zone-Main	TRUE	225	300	300	150	390	150	362	6014: 3891	TRUE

Table C3: Existing System With Upgrades Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-304	479: Zone-Main	TRUE	No Hydrant	300	300	150	392	150	364	6014: 3891	TRUE
J-305	479: Zone-Main	TRUE	No Hydrant	300	300	150	393	150	363	6014: 3891	TRUE
J-307	479: Zone-Main	TRUE	225	300	300	150	392	150	355	6014: 3891	TRUE
J-308	479: Zone-Main	TRUE	No Hydrant	300	300	150	393	150	355	6014: 3891	TRUE
J-309	479: Zone-Main	TRUE	No Hydrant	300	300	150	322	150	349	6014: 3891	TRUE
J-3095	479: Zone-Main	TRUE	225	233	233	150	170	150	150	6834: 377340	TRUE
J-31	479: Zone-Main	TRUE	No Hydrant	233	233	150	150	150	251	6014: 3891	TRUE
J-310	479: Zone-Main	TRUE	225	300	301	150	184	150	308	6014: 3891	TRUE
J-3100	479: Zone-Main	FALSE	225	225	225	150	150	150	158	6135: 110585	TRUE
J-311	479: Zone-Main	TRUE	No Hydrant	300	300	150	258	150	290	6014: 3891	TRUE
J-312	479: Zone-Main	TRUE	100	208	208	150	150	150	186	6014: 3891	TRUE
J-3122	479: Zone-Main	TRUE	100	154	154	150	150	150	209	6731: 370154	TRUE
J-3127	479: Zone-Main	TRUE	225	270	270	150	167	150	150	6834: 377340	TRUE
J-313	479: Zone-Main	TRUE	225	277	277	150	150	150	181	498: J-312	TRUE
J-314	479: Zone-Main	TRUE	100	278	278	150	150	150	218	6014: 3891	TRUE
J-3140	479: Zone-Main	TRUE	100	279	279	150	150	150	168	16598: J-3795	TRUE
J-315	479: Zone-Main	TRUE	100	300	300	150	169	150	206	6014: 3891	TRUE
J-3153	479: Zone-Main	FALSE	225	190	190	150	164	150	213	14696: J-3323	TRUE
J-316	479: Zone-Main	TRUE	185	295	295	150	150	150	208	894: J-1516	TRUE
J-317	479: Zone-Main	TRUE	100	300	301	150	224	150	269	6014: 3891	TRUE
J-3178	479: Zone-Main	TRUE	100	300	300	150	257	150	271	6014: 3891	TRUE
J-318	479: Zone-Main	TRUE	No Hydrant	300	300	150	258	150	285	6014: 3891	TRUE
J-319	479: Zone-Main	TRUE	100	300	300	150	260	150	283	6014: 3891	TRUE
J-32	479: Zone-Main	TRUE	100	256	256	150	150	150	230	6014: 3891	TRUE
J-320	479: Zone-Main	TRUE	185	242	243	150	150	150	253	530: J-321	TRUE
J-321	479: Zone-Main	TRUE	100	244	244	150	150	150	247	6014: 3891	TRUE
J-3216	479: Zone-Main	TRUE	225	300	302	150	320	150	325	6014: 3891	TRUE
J-322	479: Zone-Main	TRUE	No Hydrant	300	300	150	162	150	179	6014: 3891	TRUE
J-323	479: Zone-Main	TRUE	No Hydrant	207	207	150	150	150	282	6014: 3891	TRUE
J-324	479: Zone-Main	TRUE	185	300	300	150	323	150	321	2393: J-2128	TRUE
J-325	479: Zone-Main	TRUE	225	300	301	150	253	150	278	18392: J-3916	TRUE
J-326	479: Zone-Main	TRUE	No Hydrant	300	300	150	379	150	354	6014: 3891	TRUE
J-3277	479: Zone-Main	TRUE	100	264	264	150	150	150	188	16598: J-3795	TRUE
J-328	479: Zone-Main	TRUE	No Hydrant	300	300	150	555	150	384	6014: 3891	TRUE
J-33	479: Zone-Main	TRUE	No Hydrant	300	300	150	260	150	265	6014: 3891	TRUE
J-330	479: Zone-Main	TRUE	No Hydrant	300	300	150	389	150	358	6014: 3891	TRUE
J-3302	479: Zone-Main	TRUE	100	277	277	150	150	150	189	6014: 3891	TRUE
J-3323	479: Zone-Main	FALSE	225	215	217	150	150	150	151	14134: J-3153	TRUE
J-34	479: Zone-Main	TRUE	185	292	292	150	158	150	150	563: J-35	TRUE
J-3449	479: Zone-Main	TRUE	100	292	292	150	154	150	150	16598: J-3795	TRUE
J-35	479: Zone-Main	TRUE	225	230	232	150	150	150	273	564: J-34	TRUE
J-36	479: Zone-Main	TRUE	225	300	300	150	334	150	297	6192: 116421	TRUE
J-3643	479: Zone-Main	TRUE	225	242	242	150	169	150	150	5951: 1680	TRUE
J-3656	479: Zone-Main	TRUE	225	299	300	150	150	150	165	18310: J-3888	TRUE
J-3659	479: Zone-Main	TRUE	225	232	232	150	150	150	154	637: J-131	TRUE
J-3668	479: Zone-Main	TRUE	100	264	264	150	150	150	187	16598: J-3795	TRUE
J-37	479: Zone-Main	TRUE	185	300	300	150	342	150	298	6192: 116421	TRUE
J-3705	479: Zone-Main	TRUE	100	300	300	150	303	150	264	6014: 3891	TRUE
J-3708	479: Zone-Main	FALSE	225	86	87	150	150	150	164	7007: 390267	TRUE
J-3709	479: Zone-Main	TRUE	100	287	287	150	156	150	150	6258: 127105	TRUE
J-3710	479: Zone-Main	TRUE	100	274	274	150	150	150	217	6014: 3891	TRUE
J-3711	479: Zone-Main	TRUE	100	300	300	150	227	150	248	6014: 3891	TRUE
J-3712	479: Zone-Main	TRUE	No Hydrant	300	300	150	324	150	306	6014: 3891	TRUE
J-3713	479: Zone-Main	TRUE	No Hydrant	300	300	150	327	150	313	6014: 3891	TRUE
J-3715	479: Zone-Main	TRUE	No Hydrant	300	300	150	294	150	271	6014: 3891	TRUE
J-3718	479: Zone-Main	TRUE	225	232	232	150	163	150	150	7023: 393523	TRUE
J-3719	479: Zone-Main	TRUE	225	228	228	150	150	150	152	14000: J-3100	TRUE
J-3720	479: Zone-Main	TRUE	No Hydrant	202	202	150	150	150	182	6014: 3891	TRUE
J-3721	479: Zone-Main	TRUE	No Hydrant	227	227	150	150	150	152	6014: 3891	TRUE
J-3722	479: Zone-Main	TRUE	225	230	231	150	150	150	162	6651: 188078	TRUE
J-3724	479: Zone-Main	FALSE	225	212	212	150	150	150	280	18310: J-3888	TRUE
J-3725	479: Zone-Main	TRUE	225	300	301	150	177	150	167	18310: J-3888	TRUE
J-3726	479: Zone-Main	TRUE	No Hydrant	232	232	150	150	150	182	6014: 3891	TRUE
J-3727	479: Zone-Main	TRUE	185	238	238	150	150	150	165	1101: J-1974	TRUE
J-3728	479: Zone-Main	TRUE	No Hydrant	223	223	150	150	150	152	6014: 3891	TRUE
J-3729	479: Zone-Main	TRUE	No Hydrant	162	162	150	298	150	298	6014: 3891	TRUE
J-3730	479: Zone-Main	TRUE	100	120	120	150	150	150	192	745: J-1184	TRUE
J-3731	479: Zone-Main	TRUE	100	118	119	150	150	150	290	874: J-1476	TRUE
J-3732	479: Zone-Main	TRUE	100	127	127	150	157	150	326	6014: 3891	TRUE
J-3733	479: Zone-Main	TRUE	100	164	164	150	152	150	150	6014: 3891	TRUE
J-3734	479: Zone-Main	TRUE	100	133	133	150	150	150	385	6014: 3891	TRUE
J-3735	479: Zone-Main	TRUE	100	138	138	150	150	150	385	6014: 3891	TRUE
J-3736	479: Zone-Main	TRUE	100	232	232	150	151	150	150	6014: 3891	TRUE
J-3737	479: Zone-Main	TRUE	100	165	165	150	150	150	261	6014: 3891	TRUE
J-3738	479: Zone-Main	TRUE	100	157	157	150	150	150	243	6014: 3891	TRUE
J-3739	479: Zone-Main	TRUE	100	185	185	150	150	150	267	6014: 3891	TRUE
J-3740	479: Zone-Main	TRUE	100	224	225	150	150	150	151	6014: 3891	TRUE
J-3741	479: Zone-Main	TRUE	No Hydrant	288	288	150	150	150	221	6014: 3891	TRUE
J-3742	479: Zone-Main	TRUE	No Hydrant	291	291	150	192	150	212	6014: 3891	TRUE
J-3743	479: Zone-Main	TRUE	100	300	300	150	150	150	193	6014: 3891	TRUE
J-3744	479: Zone-Main	TRUE	100	268	268	150	150	150	311	6014: 3891	TRUE
J-3745	479: Zone-Main	TRUE	100	271	271	150	150	150	299	6014: 3891	TRUE
J-3746	479: Zone-Main	TRUE	100	105	105	150	150	150	354	884: J-1496	TRUE
J-3747	479: Zone-Main	TRUE	100	123	123	150	150	150	249	883: J-1494	TRUE
J-3748	479: Zone-Main	TRUE	100	154	154	150	150	150	249	6014: 3891	TRUE
J-3749	479: Zone-Main	TRUE	100	219	220	150	150	150	210	6014: 3891	TRUE
J-3750	479: Zone-Main	TRUE	100	300	300	150	296	150	294	6014: 3891	TRUE
J-3751	479: Zone-Main	TRUE	100	300	300	150	301	150	297	6014: 3891	TRUE
J-3752	479: Zone-Main	TRUE	100	300	300	150	322	150	313	6014: 3891	TRUE
J-3753	479: Zone-Main	TRUE	100	300	300	150	315	150	312	6014: 3891	TRUE

Table C3: Existing System With Upgrades Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-3754	479: Zone-Main	TRUE	100	300	300	150	231	150	313	6014: 3891	TRUE
J-3755	479: Zone-Main	TRUE	100	300	301	150	188	150	312	6014: 3891	TRUE
J-3756	479: Zone-Main	TRUE	100	300	300	150	313	150	310	6014: 3891	TRUE
J-3757	479: Zone-Main	TRUE	225	241	241	150	150	150	353	6014: 3891	TRUE
J-3758	479: Zone-Main	TRUE	225	300	300	150	256	150	253	6014: 3891	TRUE
J-3759	479: Zone-Main	TRUE	No Hydrant	122	122	150	150	150	230	16515: J-3764	TRUE
J-3760	479: Zone-Main	TRUE	No Hydrant	184	184	150	155	150	150	6014: 3891	TRUE
J-3761	479: Zone-Main	TRUE	No Hydrant	300	300	150	226	150	226	6014: 3891	TRUE
J-3764	479: Zone-Main	TRUE	No Hydrant	136	136	150	151	150	150	16505: J-3759	TRUE
J-3765	479: Zone-Main	TRUE	No Hydrant	105	105	150	150	150	347	6014: 3891	TRUE
J-3766	479: Zone-Main	TRUE	No Hydrant	142	142	150	158	150	150	6014: 3891	TRUE
J-3767	479: Zone-Main	TRUE	No Hydrant	162	162	150	156	150	150	6014: 3891	TRUE
J-3768	479: Zone-Main	TRUE	No Hydrant	195	195	150	151	150	150	6014: 3891	TRUE
J-3769	479: Zone-Main	TRUE	225	300	301	150	189	150	191	16519: J-3765	TRUE
J-3771	479: Zone-Main	TRUE	185	300	301	150	237	150	285	6014: 3891	TRUE
J-3772	479: Zone-Main	TRUE	No Hydrant	300	300	150	218	150	282	6014: 3891	TRUE
J-3773	479: Zone-Main	TRUE	No Hydrant	300	300	150	295	150	320	6014: 3891	TRUE
J-3774	479: Zone-Main	TRUE	185	198	198	150	150	150	173	6161: 111115	TRUE
J-3777	479: Zone-Main	TRUE	No Hydrant	196	196	150	150	150	296	6014: 3891	TRUE
J-3780	479: Zone-Main	TRUE	No Hydrant	300	300	150	256	150	251	6014: 3891	TRUE
J-3781	479: Zone-Main	TRUE	No Hydrant	300	300	150	262	150	276	6014: 3891	TRUE
J-3782	479: Zone-Main	TRUE	No Hydrant	300	300	150	325	150	310	6014: 3891	TRUE
J-3783	479: Zone-Main	TRUE	No Hydrant	300	300	150	257	150	306	6014: 3891	TRUE
J-3784	479: Zone-Main	TRUE	No Hydrant	300	300	150	210	150	303	6014: 3891	TRUE
J-3785	479: Zone-Main	TRUE	No Hydrant	300	300	150	282	150	296	6014: 3891	TRUE
J-3786	479: Zone-Main	TRUE	100	146	146	150	150	150	222	16580: J-3787	TRUE
J-3787	479: Zone-Main	TRUE	100	174	174	150	151	150	150	16579: J-3786	TRUE
J-3788	479: Zone-Main	TRUE	100	253	253	150	153	150	150	16584: J-3789	TRUE
J-3789	479: Zone-Main	TRUE	100	178	178	150	150	150	271	16579: J-3786	TRUE
J-3790	479: Zone-Main	TRUE	100	300	300	150	243	150	240	6014: 3891	TRUE
J-3791	479: Zone-Main	TRUE	100	141	141	150	150	150	212	16591: J-3792	TRUE
J-3792	479: Zone-Main	TRUE	100	163	163	150	150	150	154	16590: J-3791	TRUE
J-3793	479: Zone-Main	TRUE	100	201	201	150	152	150	150	16591: J-3792	TRUE
J-3794	479: Zone-Main	TRUE	100	165	165	150	150	150	228	16591: J-3792	TRUE
J-3795	479: Zone-Main	TRUE	100	136	136	150	169	150	272	16601: J-3797	TRUE
J-3796	479: Zone-Main	TRUE	100	177	177	150	161	150	150	16598: J-3795	TRUE
J-3797	479: Zone-Main	TRUE	100	144	144	150	150	150	221	16598: J-3795	TRUE
J-3798	479: Zone-Main	TRUE	100	293	294	150	163	150	150	16598: J-3795	TRUE
J-3799	479: Zone-Main	TRUE	100	300	300	150	163	150	154	16598: J-3795	TRUE
J-38	479: Zone-Main	TRUE	225	253	253	150	150	150	171	560: J-39	TRUE
J-380	479: Zone-Main	TRUE	No Hydrant	300	300	150	465	150	383	6014: 3891	TRUE
J-3800	479: Zone-Main	TRUE	100	224	224	150	150	150	239	16598: J-3795	TRUE
J-3801	479: Zone-Main	TRUE	100	288	288	150	150	150	153	16598: J-3795	TRUE
J-3802	479: Zone-Main	TRUE	100	143	143	150	150	150	225	2393: J-2128	TRUE
J-3803	479: Zone-Main	TRUE	100	176	177	150	151	150	150	2393: J-2128	TRUE
J-3805	479: Zone-Main	TRUE	225	244	245	150	150	150	309	16626: J-3807	TRUE
J-3806	479: Zone-Main	TRUE	No Hydrant	300	300	150	303	150	308	6014: 3891	TRUE
J-3807	479: Zone-Main	TRUE	No Hydrant	298	298	150	157	150	150	6014: 3891	TRUE
J-3808	479: Zone-Main	TRUE	225	300	301	150	174	150	152	18071: J-3861	TRUE
J-3809	479: Zone-Main	TRUE	185	292	293	150	150	150	356	6014: 3891	TRUE
J-3810	479: Zone-Main	TRUE	No Hydrant	291	291	150	150	150	356	6014: 3891	TRUE
J-3811	479: Zone-Main	TRUE	185	300	301	150	402	150	356	6014: 3891	TRUE
J-3812	479: Zone-Main	TRUE	185	276	276	150	150	150	357	6014: 3891	TRUE
J-3813	479: Zone-Main	TRUE	No Hydrant	300	300	150	297	150	356	6014: 3891	TRUE
J-3814	479: Zone-Main	TRUE	225	300	300	150	257	150	326	6014: 3891	TRUE
J-3815	479: Zone-Main	TRUE	225	243	243	150	150	150	167	18041: HYD_35	TRUE
J-3816	479: Zone-Main	TRUE	225	278	278	150	150	150	351	6014: 3891	TRUE
J-3817	479: Zone-Main	TRUE	100	300	300	150	199	150	207	6014: 3891	TRUE
J-3818	479: Zone-Main	TRUE	225	243	243	150	150	150	162	18044: HYD_45	TRUE
J-3819	479: Zone-Main	TRUE	No Hydrant	300	300	150	411	150	394	6014: 3891	TRUE
J-3820	479: Zone-Main	TRUE	No Hydrant	300	300	150	411	150	394	6014: 3891	TRUE
J-3821	479: Zone-Main	TRUE	No Hydrant	300	300	150	411	150	394	6014: 3891	TRUE
J-3822	479: Zone-Main	TRUE	No Hydrant	300	300	150	410	150	394	6014: 3891	TRUE
J-3823	479: Zone-Main	TRUE	No Hydrant	300	300	150	412	150	357	6014: 3891	TRUE
J-3824	479: Zone-Main	TRUE	No Hydrant	300	300	150	380	150	357	6014: 3891	TRUE
J-3825	479: Zone-Main	TRUE	No Hydrant	300	300	150	375	150	357	6014: 3891	TRUE
J-3826	479: Zone-Main	TRUE	No Hydrant	300	300	150	384	150	357	6014: 3891	TRUE
J-3827	479: Zone-Main	TRUE	No Hydrant	263	263	150	150	150	344	6014: 3891	TRUE
J-3829	479: Zone-Main	TRUE	No Hydrant	300	300	150	650	150	385	6014: 3891	TRUE
J-3830	479: Zone-Main	TRUE	No Hydrant	300	300	150	650	150	385	6014: 3891	TRUE
J-3831	479: Zone-Main	TRUE	No Hydrant	300	300	150	650	150	385	6014: 3891	TRUE
J-3832	479: Zone-Main	TRUE	No Hydrant	300	300	150	353	150	345	6014: 3891	TRUE
J-3834	479: Zone-Main	TRUE	No Hydrant	300	300	150	373	150	368	6014: 3891	TRUE
J-3855	479: Zone-Main	FALSE	225	224	224	150	156	150	150	18071: J-3861	TRUE
J-3856	479: Zone-Main	FALSE	225	198	198	150	150	150	191	18071: J-3861	TRUE
J-3857	479: Zone-Main	TRUE	No Hydrant	200	200	150	151	150	150	6014: 3891	TRUE
J-3858	479: Zone-Main	TRUE	No Hydrant	197	197	150	150	150	179	6014: 3891	TRUE
J-3859	479: Zone-Main	TRUE	No Hydrant	206	206	150	153	150	150	6014: 3891	TRUE
J-3860	479: Zone-Main	TRUE	No Hydrant	184	184	150	150	150	196	6014: 3891	TRUE
J-3861	479: Zone-Main	TRUE	No Hydrant	183	183	150	150	150	204	6014: 3891	TRUE
J-3862	479: Zone-Main	FALSE	225	114	114	150	150	150	203	18073: J-3863	TRUE
J-3863	479: Zone-Main	FALSE	225	121	121	150	158	150	150	18072: J-3862	TRUE
J-3864	479: Zone-Main	FALSE	225	133	134	150	159	150	150	18072: J-3862	TRUE
J-3865	479: Zone-Main	TRUE	No Hydrant	279	279	150	150	150	358	6014: 3891	TRUE
J-3870	479: Zone-Main	TRUE	No Hydrant	300	300	150	170	150	326	6014: 3891	TRUE
J-3871	479: Zone-Main	TRUE	No Hydrant	300	300	150	391	150	358	6014: 3891	TRUE
J-3881	479: Zone-Main	TRUE	No Hydrant	300	300	150	310	150	325	6014: 3891	TRUE
J-3887	479: Zone-Main	TRUE	No Hydrant	155	155	150	164	150	150	6014: 3891	TRUE
J-3888	479: Zone-Main	TRUE	No Hydrant	263	263	150	150	150	187	6014: 3891	TRUE
J-3890	479: Zone-Main	TRUE	No Hydrant	300	300	150	307	150	281	6014: 3891	TRUE

Table C3: Existing System With Upgrades Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-3891	479: Zone-Main	TRUE	No Hydrant	300	300	150	298	150	268	6014: 3891	TRUE
J-3892	479: Zone-Main	TRUE	No Hydrant	300	300	150	266	150	287	6014: 3891	TRUE
J-3893	479: Zone-Main	TRUE	No Hydrant	300	300	150	290	150	280	6014: 3891	TRUE
J-3894	479: Zone-Main	TRUE	No Hydrant	300	300	150	284	150	286	6014: 3891	TRUE
J-3895	479: Zone-Main	TRUE	No Hydrant	300	300	150	189	150	268	6014: 3891	TRUE
J-3896	479: Zone-Main	TRUE	No Hydrant	299	299	150	228	150	150	6014: 3891	TRUE
J-3897	479: Zone-Main	TRUE	No Hydrant	284	284	150	150	150	153	16598: J-3795	TRUE
J-3898	479: Zone-Main	TRUE	No Hydrant	286	286	150	150	150	152	16598: J-3795	TRUE
J-3899	479: Zone-Main	TRUE	No Hydrant	171	171	150	150	150	259	16598: J-3795	TRUE
J-39	479: Zone-Main	TRUE	225	245	245	150	150	150	183	561: J-38	TRUE
J-3900	479: Zone-Main	TRUE	No Hydrant	208	208	150	156	150	150	18341: J-3902	TRUE
J-3901	479: Zone-Main	TRUE	No Hydrant	177	177	150	150	150	213	18341: J-3902	TRUE
J-3902	479: Zone-Main	TRUE	No Hydrant	196	196	150	150	150	180	18337: J-3900	TRUE
J-3903	479: Zone-Main	TRUE	No Hydrant	300	300	150	281	150	278	6014: 3891	TRUE
J-3904	479: Zone-Main	TRUE	No Hydrant	300	300	150	165	150	291	6014: 3891	TRUE
J-3905	479: Zone-Main	TRUE	No Hydrant	300	300	150	245	150	266	6014: 3891	TRUE
J-3906	479: Zone-Main	TRUE	No Hydrant	300	300	150	337	150	311	6014: 3891	TRUE
J-3907	479: Zone-Main	TRUE	No Hydrant	300	300	150	302	150	292	6014: 3891	TRUE
J-3908	479: Zone-Main	TRUE	No Hydrant	282	262	150	150	150	312	6014: 3891	TRUE
J-3909	479: Zone-Main	TRUE	No Hydrant	248	248	150	150	150	314	6014: 3891	TRUE
J-3910	479: Zone-Main	TRUE	No Hydrant	300	300	150	274	150	279	6014: 3891	TRUE
J-3911	479: Zone-Main	TRUE	No Hydrant	214	214	150	150	150	173	6014: 3891	TRUE
J-3914	479: Zone-Main	TRUE	No Hydrant	300	300	150	394	150	354	6014: 3891	TRUE
J-3915	479: Zone-Main	TRUE	No Hydrant	300	300	150	333	150	335	6014: 3891	TRUE
J-3916	479: Zone-Main	TRUE	No Hydrant	300	300	150	277	150	275	6014: 3891	TRUE
J-3933	479: Zone-Main	TRUE	No Hydrant	300	300	150	298	150	309	6014: 3891	TRUE
J-3936	479: Zone-Main	TRUE	No Hydrant	241	241	150	150	150	157	6014: 3891	TRUE
J-3937	479: Zone-Main	TRUE	No Hydrant	300	300	150	355	150	328	6014: 3891	TRUE
J-3943	479: Zone-Main	TRUE	No Hydrant	256	256	150	153	150	150	858: J-1444	TRUE
J-3956	479: Zone-Main	TRUE	No Hydrant	259	259	150	150	150	214	18530: J-3958	TRUE
J-3957	479: Zone-Main	TRUE	No Hydrant	300	300	150	274	150	272	6014: 3891	TRUE
J-3958	479: Zone-Main	TRUE	No Hydrant	254	254	150	150	150	227	18525: J-3956	TRUE
J-3959	479: Zone-Main	TRUE	No Hydrant	248	248	150	153	150	150	18536: J-3962	TRUE
J-3960	479: Zone-Main	TRUE	No Hydrant	192	192	150	150	150	238	18536: J-3962	TRUE
J-3961	479: Zone-Main	TRUE	No Hydrant	229	229	150	151	150	150	18536: J-3962	TRUE
J-3962	479: Zone-Main	TRUE	No Hydrant	189	189	150	154	150	230	18535: J-3961	TRUE
J-3963	479: Zone-Main	TRUE	No Hydrant	189	189	150	153	150	229	18536: J-3962	TRUE
J-3964	479: Zone-Main	TRUE	No Hydrant	197	197	150	150	150	214	18545: J-3965	TRUE
J-3965	479: Zone-Main	TRUE	No Hydrant	237	237	150	150	150	152	18543: J-3964	TRUE
J-3966	479: Zone-Main	TRUE	No Hydrant	300	300	150	320	150	303	6014: 3891	TRUE
J-3967	479: Zone-Main	TRUE	No Hydrant	269	269	150	150	150	183	18545: J-3965	TRUE
J-3968	479: Zone-Main	TRUE	No Hydrant	300	300	150	323	150	302	6014: 3891	TRUE
J-3969	479: Zone-Main	TRUE	No Hydrant	280	280	150	150	150	310	6014: 3891	TRUE
J-3970	479: Zone-Main	TRUE	No Hydrant	300	300	150	334	150	311	6014: 3891	TRUE
J-3971	479: Zone-Main	TRUE	No Hydrant	300	300	150	211	150	325	6014: 3891	TRUE
J-3974	479: Zone-Main	TRUE	185	300	300	150	508	150	359	6014: 3891	TRUE
J-3987	479: Zone-Main	TRUE	No Hydrant	300	300	150	388	150	357	6014: 3891	TRUE
J-3989	<None>	TRUE	No Hydrant	84	84	150	150	150	150	18851: J-3989	TRUE
J-3995	479: Zone-Main	TRUE	No Hydrant	300	300	150	215	150	225	6014: 3891	TRUE
J-40	479: Zone-Main	TRUE	No Hydrant	300	300	150	564	150	373	6014: 3891	TRUE
J-4004	479: Zone-Main	TRUE	No Hydrant	300	300	150	427	150	383	6014: 3891	TRUE
J-4008	479: Zone-Main	TRUE	No Hydrant	300	300	150	548	150	384	6014: 3891	TRUE
J-4014	479: Zone-Main	TRUE	No Hydrant	300	300	150	296	150	281	6014: 3891	TRUE
J-4034	479: Zone-Main	TRUE	No Hydrant	300	300	150	277	150	279	6014: 3891	TRUE
J-4035	479: Zone-Main	TRUE	No Hydrant	300	300	150	413	150	354	6014: 3891	TRUE
J-4036	479: Zone-Main	TRUE	No Hydrant	269	269	150	150	150	196	6014: 3891	TRUE
J-4037	479: Zone-Main	TRUE	No Hydrant	300	300	150	248	150	279	6014: 3891	TRUE
J-4039	479: Zone-Main	TRUE	225	300	300	150	412	150	354	6014: 3891	TRUE
J-4040	479: Zone-Main	TRUE	No Hydrant	300	300	150	409	150	354	6014: 3891	TRUE
J-4041	479: Zone-Main	TRUE	No Hydrant	300	300	150	383	150	354	6014: 3891	TRUE
J-4044	479: Zone-Main	TRUE	No Hydrant	154	154	150	150	150	239	854: J-1436	TRUE
J-4045	479: Zone-Main	TRUE	No Hydrant	246	246	150	150	150	169	3262: J-2388	TRUE
J-4047	479: Zone-Main	TRUE	No Hydrant	300	300	150	195	150	206	6014: 3891	TRUE
J-4048	479: Zone-Main	TRUE	No Hydrant	79	79	150	150	150	393	6014: 3891	TRUE
J-4049	479: Zone-Main	TRUE	No Hydrant	300	300	150	512	150	358	6014: 3891	TRUE
J-4051	479: Zone-Main	TRUE	No Hydrant	300	300	150	207	150	280	6014: 3891	TRUE
J-4052	479: Zone-Main	TRUE	No Hydrant	300	300	150	291	150	288	6014: 3891	TRUE
J-4053	479: Zone-Main	TRUE	No Hydrant	300	300	150	212	150	291	6014: 3891	TRUE
J-4058	479: Zone-Main	TRUE	No Hydrant	300	300	150	329	150	325	6014: 3891	TRUE
J-4059	479: Zone-Main	TRUE	No Hydrant	300	300	150	311	150	311	6014: 3891	TRUE
J-4066	479: Zone-Main	TRUE	No Hydrant	170	170	150	150	150	150	19196: J-4067	TRUE
J-4067	479: Zone-Main	TRUE	No Hydrant	170	170	150	150	150	150	19194: J-4066	TRUE
J-4071	479: Zone-Main	TRUE	No Hydrant	300	300	150	304	150	311	6014: 3891	TRUE
J-41	479: Zone-Main	TRUE	No Hydrant	300	300	150	554	150	371	6014: 3891	TRUE
J-42	479: Zone-Main	TRUE	225	279	279	150	150	150	163	7023: 393523	TRUE
J-43	479: Zone-Main	FALSE	225	217	217	150	150	150	333	18053: HYD_303	TRUE
J-44	479: Zone-Main	TRUE	No Hydrant	300	300	150	399	150	311	6014: 3891	TRUE
J-45	479: Zone-Main	TRUE	225	235	236	150	150	150	253	18231: HYD_279	TRUE
J-46	479: Zone-Main	TRUE	No Hydrant	291	291	150	150	150	158	6014: 3891	TRUE
J-47	479: Zone-Main	TRUE	225	300	300	150	332	150	270	18310: J-3888	TRUE
J-48	479: Zone-Main	TRUE	No Hydrant	300	300	150	374	150	252	6014: 3891	TRUE
J-49	479: Zone-Main	TRUE	225	248	248	150	171	150	150	2074: J-1999	TRUE
J-50	479: Zone-Main	TRUE	100	237	237	150	166	150	150	6014: 3891	TRUE
J-51	479: Zone-Main	TRUE	225	233	234	150	150	150	161	2074: J-1999	TRUE
J-52	479: Zone-Main	TRUE	225	300	300	150	332	150	339	6014: 3891	TRUE
J-54	479: Zone-Main	TRUE	225	300	300	150	486	150	357	6014: 3891	TRUE
J-55	479: Zone-Main	TRUE	225	300	300	150	438	150	356	6014: 3891	TRUE
J-56	479: Zone-Main	TRUE	225	300	301	150	461	150	354	6014: 3891	TRUE
J-57	479: Zone-Main	TRUE	225	300	301	150	459	150	356	6014: 3891	TRUE
J-58	479: Zone-Main	TRUE	No Hydrant	300	300	150	406	150	355	6014: 3891	TRUE

Table C3: Existing System With Upgrades Model Fire Flow Results -West End Reservoir and Water Treatment Plant Pumphouses Operating

Label	Zone	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Available) (L/s)	Pressure (Residual Lower Limit) (kPa)	Pressure (Calculated Residual) (kPa)	Pressure (Zone Lower Limit) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone @ Total Flow Needed)	Is Fire Flow Run Balanced?
J-59	479: Zone-Main	TRUE	No Hydrant	300	300	150	398	150	355	6014: 3891	TRUE
J-60	479: Zone-Main	TRUE	No Hydrant	300	300	150	367	150	354	6014: 3891	TRUE
J-61	479: Zone-Main	TRUE	225	300	307	150	377	150	332	6834: 377340	TRUE
J-62	479: Zone-Main	TRUE	185	300	300	150	351	150	353	6014: 3891	TRUE
J-63	479: Zone-Main	TRUE	100	300	300	150	373	150	355	6014: 3891	TRUE
J-64	479: Zone-Main	TRUE	225	300	301	150	318	150	254	6834: 377340	TRUE
J-65	479: Zone-Main	TRUE	225	300	301	150	223	150	228	6834: 377340	TRUE
J-66	479: Zone-Main	TRUE	225	300	300	150	314	150	244	6834: 377340	TRUE
J-67	479: Zone-Main	TRUE	No Hydrant	248	248	150	150	150	173	6014: 3891	TRUE
J-68	479: Zone-Main	TRUE	225	291	291	150	150	150	178	554: J-272	TRUE
J-69	479: Zone-Main	FALSE	225	213	213	150	150	150	320	674: J-68	TRUE
J-7	479: Zone-Main	TRUE	No Hydrant	300	300	150	632	150	385	6014: 3891	TRUE
J-70	479: Zone-Main	TRUE	225	300	301	150	236	150	262	6834: 377340	TRUE
J-71	479: Zone-Main	TRUE	No Hydrant	300	300	150	309	150	304	6014: 3891	TRUE
J-72	479: Zone-Main	TRUE	225	300	300	150	234	150	275	3316: J-2406	TRUE
J-73	479: Zone-Main	TRUE	225	300	300	150	331	150	352	6014: 3891	TRUE
J-74	479: Zone-Main	TRUE	225	300	300	150	300	150	306	5951: 1680	TRUE
J-75	479: Zone-Main	TRUE	No Hydrant	300	300	150	332	150	335	6014: 3891	TRUE
J-76	479: Zone-Main	TRUE	225	300	301	150	188	150	278	1048: J-1880	TRUE
J-77	479: Zone-Main	TRUE	No Hydrant	300	300	150	331	150	327	6014: 3891	TRUE
J-78	479: Zone-Main	TRUE	225	300	300	150	335	150	328	6014: 3891	TRUE
J-79	479: Zone-Main	TRUE	225	300	302	150	316	150	339	6014: 3891	TRUE
J-8	479: Zone-Main	TRUE	No Hydrant	300	300	150	631	150	385	6014: 3891	TRUE
J-80	479: Zone-Main	TRUE	No Hydrant	300	300	150	264	150	353	6014: 3891	TRUE
J-81	479: Zone-Main	TRUE	No Hydrant	300	300	150	383	150	353	6014: 3891	TRUE
J-82	479: Zone-Main	TRUE	225	300	303	150	388	150	353	6014: 3891	TRUE
J-83	479: Zone-Main	TRUE	225	300	300	150	297	150	353	6014: 3891	TRUE
J-84	479: Zone-Main	TRUE	225	300	300	150	322	150	348	6014: 3891	TRUE
J-85	479: Zone-Main	TRUE	225	300	300	150	296	150	343	6014: 3891	TRUE
J-86	479: Zone-Main	TRUE	225	300	301	150	363	150	354	6014: 3891	TRUE
J-87	479: Zone-Main	TRUE	225	300	300	150	382	150	354	6014: 3891	TRUE
J-88	479: Zone-Main	TRUE	225	300	301	150	388	150	362	6014: 3891	TRUE
J-9	479: Zone-Main	TRUE	No Hydrant	300	300	150	631	150	384	6014: 3891	TRUE
J-90	479: Zone-Main	TRUE	225	300	301	150	331	150	352	6014: 3891	TRUE
J-91	479: Zone-Main	TRUE	225	300	300.81	150	179.7	150	349	6014: 3891	TRUE
J-92	479: Zone-Main	TRUE	225	300	300	150	327.8	150	351.3	6014: 3891	TRUE
J-93	479: Zone-Main	TRUE	No Hydrant	300	300	150	236.8	150	284.7	6014: 3891	TRUE
J-94	479: Zone-Main	TRUE	No Hydrant	294.72	294.72	150	150	150	163.1	6014: 3891	TRUE
J-95	479: Zone-Main	TRUE	225	286.53	286.99	150	150	150	220.7	891: J-1510	TRUE
J-96	479: Zone-Main	TRUE	225	281.6	282.19	150	150	150	274	607: J-95	TRUE
J-97	479: Zone-Main	TRUE	225	300	302.07	150	302.3	150	330.2	6014: 3891	TRUE
J-98	479: Zone-Main	TRUE	No Hydrant	300	300	150	317.3	150	316.2	6014: 3891	TRUE
J-99	479: Zone-Main	TRUE	225	300	300	150	276.7	150	283.2	759: J-1218	TRUE

Note:

1. The maximum fire flow tested is 300 L/s. High fire flows may be possible if residual and zone pressures are still greater than 150 kPa when 300 L/s is reached.



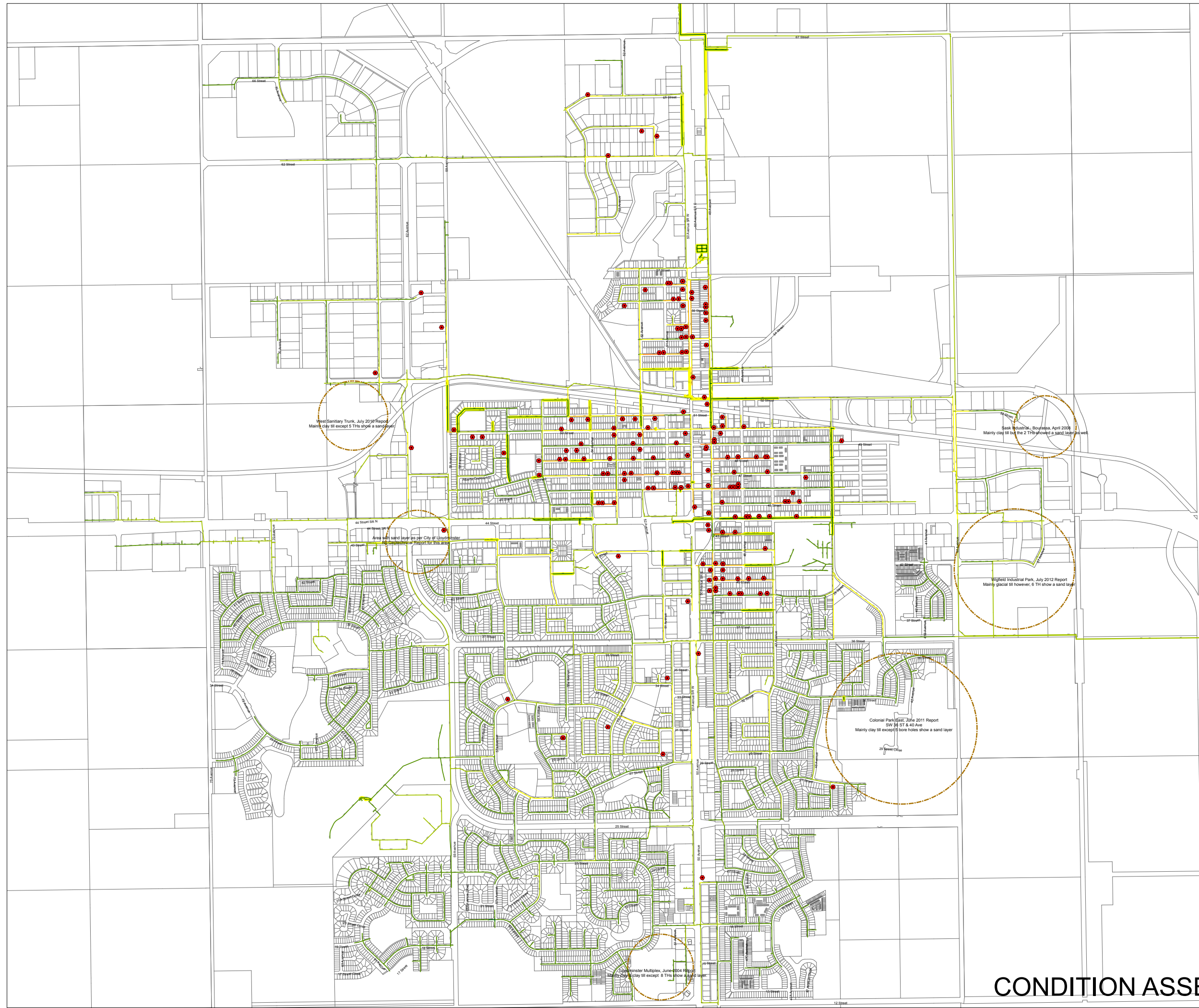
Appendix D
Condition Assessment Data





Legend

- WaterMainBreaks
- Total_Pts**
- 0
- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60
- - - Geotech_Locations
- TRN_E_CENTERLINE
- WTR_PIPE_Abandoned



CONDITION ASSESSMENT

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
9933	WTRMA005624	0.64	AC	200	1975		0	0	Industrial	7	8	3	0	18
9935	WTRMA005622	1.22	AC	400	1975		0	0	Commerical	13	8	3	0	24
9937	WTRMA005623	6.47	AC	400	1975		0	0	Commerical	13	8	3	0	24
9939	WTRMA005620	1.50	PVC	400	2006		0	0	Industrial	12	0	1	0	13
9941	WTRMA005621	2.80	PVC	400	2006		0	0	Industrial	12	0	1	0	13
9943	WTRMA005619	71.45	PVC	400	2006		0	0	Industrial	12	0	1	0	13
9945	WTRMA005617	36.85	PVC	400	2005		0	0	Industrial	12	2	1	0	15
9947	WTRMA005618	18.00	PVC	400	2005		0	0	Industrial	12	2	1	0	15
9949	WTRMA005616	6.38	AC	300	1975		0	0	Industrial	7	8	3	0	18
9951	WTRMA005615	40.26	AC	300	1975		0	0	Industrial	7	8	3	0	18
9953	WTRMA005614	2.62	AC	200	1975		0	0	Commerical	8	8	3	0	19
9955	WTRMA005643	9.03	PVC	300	2007		0	0	Commerical	8	0	1	0	9
9969	WTRMA004424	35.96	AC	250	1974		0	0	Institutional	10	8	3	0	21
9971	WTRMA004399	1.50	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
9973	WTRMA004386	383.46	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
9975	WTRMA004377	326.58	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
9977	WTRMA004375	829.36	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
9979	WTRMA002471	78.25	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
9981	WTRMA002428	4.23	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
9983	WTRMA002288	74.10	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
9985	WTRMA001313	1.10	PVC	150	1989		0	0	Industrial	7	4	1	0	12
9989	WTRMA000408	4.05	AC	300	1975		0	0	Industrial	7	8	3	0	18
9991	WTRMA000339	0.81	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
9993	WTRMA004974	142.27	AC	250	1978		0	0	Industrial	7	6	3	10	26
9995	WTRMA004969	108.34	AC	250	1977		0	0	Industrial	7	6	3	0	16
9997	WTRMA004968	0.92	AC	200	1976		0	0	Industrial	7	6	3	0	16
9999	WTRMA003328	2.12	AC	200	1984		0	0	Parks, open space, and trails	1	6	3	0	10
10001	WTRMA003100	8.19	AC	250	1979		0	0	Industrial	7	6	3	0	16
10011	WTRMA000439	1.97	AC	200	1975		0	0	Commerical & SF - residential	8	8	3	5	24
10015	WTRMA003026	2.61	PVC	150	2006		0	0	Commerical	8	0	1	0	9
10017	WTRMA005642	202.50	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
10019	WTRMA005641	180.86	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
10021	WTRMA005640	133.97	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
10023	WTRMA005639	2.50	PVC	250	1985		0	0	Industrial	7	6	1	0	14
10025	WTRMA005638	14.71	PVC	250	1985		0	0	Industrial	7	6	1	0	14
10027	WTRMA005637	84.69	PVC	300	1986		0	0	Industrial	7	4	1	0	12
10029	WTRMA005636	14.94	PVC	300	1986		0	0	Industrial	7	4	1	0	12
10031	WTRMA005635	1.22	STL	200	1959		0	0	Industrial	7	10	1	0	18
10033	WTRMA005634	1.22	STL	200	1959		0	0	Industrial	7	10	1	0	18
10035	WTRMA005633	28.12	AC	250	1970		0	0	Commerical & industrial	8	8	3	10	29
10037	WTRMA005632	15.05	AC	400	1975		0	0	Commerical	13	8	3	0	24
10039	WTRMA005631	3.85	AC	250	1983		0	0	SF - Residential	1	6	3	0	10
10041	WTRMA005630	0.99	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
10043	WTRMA005629	3.21	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
10045	WTRMA005625	2.64	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
10047	WTRMA005626	6.89	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
10049	WTRMA005627	102.03	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
10051	WTRMA005628	6.90	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
10053	WTRMA005579	3.70	PVC	150	2006		0	0	Commerical	8	0	1	0	9
10057	WTRMA005578	16.93	PVC	400	1987		0	0	Commerical	13	4	1	0	18
10059	WTRMA005576	2.66	PVC	150	2006	2009	0	0	N/A	0	0	0	0	0
10061	WTRMA005575	12.18	AC	250	1975		0	0	Parks, open space and trails	1	8	3	0	12
10063	WTRMA005574	9.45	AC	250	1975		0	0	SF - Residential	1	8	3	0	12
10075	WTRMA005567	1.50	AC	400	1983		0	0	SF - Residential	6	6	3	0	15
10077	WTRMA005568	14.89	AC	400	1983		0	0	Institutional	15	6	3	0	24
10079	WTRMA005566	1.76	PVC	200	1998		0	0	Institutional	10	2	1	0	13
10091	WTRMA005560	2.55	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
10095	WTRMA005558	15.02	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
10099	WTRMA005556	45.19	AC	150	1968		0	0	Institutional	10	8	3	0	21
10101	WTRMA005555	54.19	AC	150	1968		0	0	Institutional	10	8	3	0	21
10103	WTRMA005554	3.90	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
10105	WTRMA005553	1.00	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
10107	WTRMA005552	11.95	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
10109	WTRMA005551	30.45	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
10111	WTRMA005550	4.50	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
10115	WTRMA005548	1.00	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
10117	WTRMA005547	0.99	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
10119	WTRMA005546	6.30	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
10121	WTRMA005545	65.03	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
10123	WTRMA005544	16.00	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
10125	WTRMA005543	1.79	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
10127	WTRMA005530	1.35	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
10129	WTRMA005529	13.65	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
10131	WTRMA005528	13.05	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
10135	WTRMA005526	48.65	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
10137	WTRMA005525	46.99	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
10139	WTRMA005524	1.75	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
10141	WTRMA005523	3.34	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
10143	WTRMA005522	1.50	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
10147	WTRMA005520	69.22	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
10149	WTRMA005519	73.89	AC	200	1977		0	0	SF - Residential	1	6	3	0	10
10151	WTRMA005518	5.14	AC	200	1977		0	0	Institutional & SF - Residential	10	6	3	0	19
10153	WTRMA005542	21.34	AC	150	1968		0	0	Commerical	8	8	3	0	19
10155	WTRMA005541	2.20	AC	150	1968		0	0	Commerical	8	8	3	0	19
10157	WTRMA005540	1.70	PVC	200	2002		0	0	Commerical	8	2	1	0	11
10159	WTRMA005538	5.46	PVC	400	2002		0	0	Commerical	13	2	1	0	16
10161	WTRMA005539	8.69	PVC	400	2002		0	0	Commerical	13	2	1	0	16
10163	WTRMA005537	1.83	AC	250	1975		0	0	Commerical	8	8	3	0	19
10165	WTRMA005536	6.12	AC	250	1976		0	0	Institutional	10	6	3	0	19
10169	WTRMA005534	1.50	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
10171	WTRMA005533	8.27	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
10173	WTRMA005532	33.73	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
10175	WTRMA005531	5.56	AC	200	1972		0	0	SF - Residential	1	8	3	0	12

Note: The pipes as labeled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
10177	WTRMA005613	2.39	AC	200	1975		0	0	SF - Residential	1	8	3	5	17
10179	WTRMA005612	2.48	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
10181	WTRMA005611	8.68	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
10183	WTRMA005610	0.85	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
10185	WTRMA005609	15.49	AC	300	1980		0	0	Industrial	7	6	3	0	16
10187	WTRMA005608	4.05	AC	300	1980		0	0	Industrial	7	6	3	0	16
10189	WTRMA005607	22.95	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
10191	WTRMA005606	39.65	AC	300	1982		0	0	Industrial	7	6	3	0	16
10193	WTRMA005605	11.34	AC	150	1979		0	0	Institutional	10	6	3	0	19
10195	WTRMA005604	89.24	AC	150	1979		0	0	Institutional	10	6	3	0	19
10197	WTRMA005603	6.18	PVC	300	1989		0	0	Industrial	7	4	1	0	12
10199	WTRMA005602	30.44	PVC	300	1989		0	0	Industrial	7	4	1	0	12
10201	WTRMA005601	29.91	AC	300	1982		0	0	Industrial	7	6	3	0	16
10203	WTRMA005600	15.99	AC	300	1982		0	0	Industrial	7	6	3	0	16
10205	WTRMA005599	86.45	AC	300	1982		0	0	Industrial	7	6	3	0	16
10207	WTRMA005598	71.76	AC	300	1982		0	0	Industrial	7	6	3	0	16
10209	WTRMA005597	15.17	AC	300	1975		0	0	Industrial	7	8	3	0	18
10211	WTRMA005596	5.62	AC	300	1975		0	0	Industrial	7	8	3	0	18
10213	WTRMA005595	0.36	AC	300	1975		0	0	Industrial	7	8	3	0	18
10215	WTRMA005594	20.82	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
10217	WTRMA005593	0.87	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
10219	WTRMA005592	15.73	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
10221	WTRMA005591	4.03	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
10223	WTRMA005590	8.97	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
10225	WTRMA005588	4.25	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
10227	WTRMA005589	10.42	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
10229	WTRMA005587	6.55	PVC	250	1990		0	0	SF - Residential	1	4	1	0	6
10231	WTRMA005586	2.59	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
10233	WTRMA005585	0.99	PVC	300	1997		0	0	Industrial	7	2	1	0	10
10237	WTRMA005583	10.00	PVC	250	1989		0	0	Industrial	7	4	1	0	12
10243	WTRMA005580	3.21	PVC	150	2006		0	0	Commercial	8	0	1	0	9
10245	WTRMA005517	19.54	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
10247	WTRMA005516	10.22	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
10249	WTRMA005515	1.36	PVC	300	2004		0	0	Commercial	8	2	1	0	11
10259	WTRMA005510	4.60	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
10265	WTRMA005508	2.36	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
10267	WTRMA005491	1.52	PVC	400	1994		0	0	Parks, open space, and trails	6	4	1	0	11
10269	WTRMA005490	14.17	PVC	400	1994		0	0	Parks, open space, and trails	6	4	1	0	11
10271	WTRMA005488	1.00	PVC	200	1989		0	0	Parks, open space, and trails	1	4	1	0	6
10273	WTRMA005489	1.00	PVC	200	1989		0	0	Parks, open space, and trails	1	4	1	0	6
10275	WTRMA005487	25.47	STL	762	1982		0	0	Commercial	13	6	1	0	20
10285	WTRMA005473	5.10	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
10287	WTRMA005476	9.00	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
10289	WTRMA005471	15.21	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
10295	WTRMA005460	23.40	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10297	WTRMA005465	10.57	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10299	WTRMA005464	50.46	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10303	WTRMA005463	8.11	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10305	WTRMA005459	1.00	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10311	WTRMA005479	15.00	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
10321	WTRMA005475	11.00	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
10329	WTRMA005505	2.88	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
10331	WTRMA005504	8.57	PVC	400	1989		0	0	SF - Residential	6	4	1	0	11
10333	WTRMA005502	2.25	PVC	200	1989		0	0	Parks, open space, and trails	1	4	1	0	6
10335	WTRMA005503	6.21	AC	200	1984		0	0	Parks, open space, and trails	1	6	3	0	10
10337	WTRMA005501	5.44	PE	50	1984		0	0	Parks, open space, and trails	1	6	1	0	8
10339	WTRMA005500	101.19	PE	50	1984		0	0	Parks, open space, and trails	1	6	1	0	8
10341	WTRMA005499	102.60	AC	200	1984		0	0	Parks, open space, and trails	1	6	3	0	10
10349	WTRMA005158	6.80	AC	150	1984		0	0	Parks, open space, and trails	1	6	3	0	10
10351	WTRMA005157	1.00	AC	150	1984		0	0	Parks, open space, and trails	1	6	3	0	10
10353	WTRMA004818	14.42	PVC	300	1987		0	0	Institutional	10	4	1	0	15
10355	WTRMA004817	32.94	PVC	300	1987		0	0	Institutional	10	4	1	0	15
10371	WTRMA004378	4.54	PVC	400	2005		0	0	Commercial	13	2	1	0	16
10373	WTRMA004306	1.99	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
10375	WTRMA004281	0.84	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
10377	WTRMA004280	0.77	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
10379	WTRMA004404	1734.07	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
10381	WTRMA002838	6.18	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
10393	WTRMA005494	2.87	PVC	250	2003		0	0	Institutional	10	2	1	0	13
10395	WTRMA005493	4.61	AC	250	1975		0	0	SF - Residential	1	8	3	0	12
10397	WTRMA005492	0.94	PVC	400	1994		0	0	Parks, open space, and trails	6	4	1	0	11
10399	WTRMA004755	145.12	PVC	400	2006		0	0	Industrial	12	0	1	0	13
10405	WTRMA004752	10.71	PVC	400	2006		0	0	Industrial	12	0	1	0	13
10419	WTRMA004728	52.55	PVC	400	2005		0	0	Commercial	13	2	1	0	16
10421	WTRMA004729	4.32	PVC	400	2005		0	0	Commercial	13	2	1	0	16
10423	WTRMA004732	12.61	PVC	400	2005		0	0	Commercial	13	2	1	0	16
10425	WTRMA004733	63.20	PVC	400	2005		0	0	Commercial	13	2	1	0	16
10427	WTRMA004734	5.83	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
10433	WTRMA004739	8.97	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
10435	WTRMA004742	18.19	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
10437	WTRMA004743	7.69	PVC	300	2006		0	0	SF - Residential	1	0	1	0	2
10449	WTRMA004750	7.70	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
10463	WTRMA005419	29.16	PVC	400	1999		0	0	Commercial	13	2	1	0	16
10465	WTRMA004302	98.56	PVC	400	1999		0	0	Commercial	13	2	1	0	16
10467	WTRMA004301	12.48	PVC	400	1999		0	0	Commercial	13	2	1	0	16
10469	WTRMA004721	1.15	PVC	200	2002		0	0	Commercial	8	2	1	0	11
10471	WTRMA004720	1.15	PVC	200	2002		0	0	Commercial	8	2	1	0	11
10473	WTRMA004719	1.98	PVC	200	2002		0	0	Commercial	8	2	1	0	11
10475	WTRMA004718	2.70	PVC	200	2002		0	0	Commercial	8	2	1	0	11
10477	WTRMA004717	16.60	PVC	400	2002		0	0	Commercial	13	2	1	0	16
10479	WTRMA004716	124.53	PVC	400	2002		0	0	Commercial	13	2	1	0	16
10481	WTRMA003816	4.32	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
10483	WTRMA003637	12.00	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
10485	WTRMA003375	12.17	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
10487	WTRMA003176	117.44	PVC	400	2002		0	0	Commercial	13	2	1	0	16
10489	WTRMA004727	8.76	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
10499	WTRMA004722	8.72	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
10501	WTRMA004345	49.22	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
10503	WTRMA005462	4.52	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10505	WTRMA005461	1.00	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10507	WTRMA005458	78.38	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10509	WTRMA005457	8.25	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10515	WTRMA005456	48.83	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10517	WTRMA005455	22.70	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10519	WTRMA005454	1.70	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10521	WTRMA005453	15.08	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10523	WTRMA005452	81.92	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10525	WTRMA005451	5.68	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10527	WTRMA005450	1.42	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10529	WTRMA005449	9.39	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10531	WTRMA005448	18.47	PVC	300	2007		0	0	Commercial	8	0	1	0	9
10533	WTRMA004767	11.70	AC	250	1973		0	0	Institutional	10	8	3	0	21
10535	WTRMA004766	2.09	AC	200	1973		0	0	Institutional	10	8	3	0	21
10537	WTRMA002182	13.84	PVC	250	1991		0	0	Institutional	10	4	1	0	15
10539	WTRMA004760	14.36	PVC	250	1991		0	0	Institutional	10	4	1	0	15
10541	WTRMA004759	126.11	PVC	250	1991		0	0	Institutional	10	4	1	0	15
10543	WTRMA004761	4.18	AC	200	1967		0	0	Institutional	10	8	3	0	21
10545	WTRMA003643	0.83	PVC	400	1985		0	0	Commercial	13	6	1	0	20
10547	WTRMA003642	1.40	PVC	300	1985		0	0	Commercial	8	6	1	0	15
10549	WTRMA003638	1.00	PVC	300	1985		0	0	Commercial	8	6	1	0	15
10551	WTRMA003690	6.27	PVC	400	1985		0	0	Commercial	13	6	1	0	20
10553	WTRMA004758	40.80	PVC	150	1985		0	0	Commercial	8	6	1	0	15
10555	WTRMA004757	1.77	PVC	250	1985		0	0	Commercial	8	6	1	0	15
10557	WTRMA004756	4.63	PVC	250	1985		0	0	Commercial	8	6	1	0	15
10559	WTRMA003780	4.00	PVC	400	1985		0	0	Commercial	13	6	1	0	20
10561	WTRMA001858	54.33	PVC	400	1985		0	0	Commercial	13	6	1	0	20
10563	WTRMA003641	33.78	PVC	250	1986		0	0	Parks, open space, and trails	1	4	1	0	6
10565	WTRMA001834	6.92	PVC	400	1994		0	0	Parks, open space, and trails	6	4	1	0	11
10567	WTRMA001830	2.25	PVC	400	1994		0	0	Parks, open space, and trails	6	4	1	0	11
10569	WTRMA004715	69.03	PVC	400	2002		0	0	Commercial	13	2	1	0	16
10571	WTRMA004714	92.35	PVC	400	2002		0	0	Commercial	13	2	1	0	16
10573	WTRMA004713	84.24	PVC	400	2002		0	0	Commercial	13	2	1	0	16
10575	WTRMA004712	34.65	PVC	400	2002		0	0	Commercial	13	2	1	0	16
10577	WTRMA004300	1.84	PVC	400	1999		0	0	Commercial	13	2	1	0	16
10579	WTRMA004088	36.96	PVC	400	1999		0	0	SF - Residential	6	2	1	0	9
10581	WTRMA004296	3.16	PVC	400	1999		0	0	Commercial	13	2	1	0	16
10583	WTRMA004294	16.00	PVC	400	1999		0	0	Commercial	13	2	1	0	16
10589	WTRMA004291	8.89	PVC	400	1999		0	0	Commercial	13	2	1	0	16
10591	WTRMA004100	6.40	AC	200	1966		0	0	SF - Residential	1	8	3	0	12
10593	WTRMA004698	6.40	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
10595	WTRMA004697	79.60	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
10597	WTRMA004317	6.40	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
10601	WTRMA004099	56.17	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
10603	WTRMA004096	13.72	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
10607	WTRMA004696	13.76	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
10609	WTRMA004695	60.50	AC	200	1968		0	0	Institutional	10	8	3	0	21
10611	WTRMA004690	5.95	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
10613	WTRMA004689	12.22	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
10617	WTRMA004670	19.63	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
10619	WTRMA004664	75.97	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
10621	WTRMA004665	11.25	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
10623	WTRMA004666	79.55	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
10625	WTRMA004667	13.72	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
10635	WTRMA004662	13.71	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
10637	WTRMA004661	6.08	AC	150	1973		0	0	SF - Residential	1	8	3	5	17
10639	WTRMA004658	190.43	AC	150	1973		0	0	SF - Residential	1	8	3	5	17
10641	WTRMA004655	55.82	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
10647	WTRMA004684	2.00	AC	150	1969		0	0	SF - Residential	1	8	3	0	12
10649	WTRMA004262	0.67	AC	150	1969		0	0	SF - Residential	1	8	3	0	12
10651	WTRMA003504	15.08	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
10653	WTRMA003501	166.43	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
10655	WTRMA004679	3.21	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
10659	WTRMA005293	10.66	AC	200	1981		0	0	Multifamily	5	6	3	0	14
10661	WTRMA005292	48.99	AC	200	1981		0	0	Multifamily	5	6	3	0	14
10665	WTRMA003396	142.52	CI	150	1952	1974	0	0	N/A	0	0	0	0	0
10667	WTRMA003408	1.85	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
10669	WTRMA003407	144.65	AC	150	1974		1	6	SF - Residential	1	8	3	0	18
10671	WTRMA004191	80.57	PVC	400	1999		0	0	Commercial	13	2	1	0	16
10673	WTRMA004180	125.00	PVC	400	1999		0	0	Commercial	13	2	1	0	16
10679	WTRMA004089	16.86	PVC	400	1999		0	0	Commercial	13	2	1	0	16
10681	WTRMA004087	2.00	PVC	400	1999		0	0	SF - Residential	6	2	1	0	9
10683	WTRMA004041	1.95	PVC	300	1986		0	0	Commercial	8	4	1	0	13
10685	WTRMA004015	12.24	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
10687	WTRMA003979	0.79	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
10691	WTRMA003951	2.10	AC	400	1980		0	0	Institutional	15	6	3	0	24
10693	WTRMA002474	3.66	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
10695	WTRMA004119	1.82	AC	200	1968		0	0	Institutional	10	8	3	0	21
10699	WTRMA004118	8.99	AC	250	1969		0	0	Institutional	10	8	3	0	21
10701	WTRMA004117	153.29	AC	250	1969		0	0	Institutional	10	8	3	0	21
10705	WTRMA004114	25.92	AC	250	1969		0	0	Institutional	10	8	3	0	21
10707	WTRMA004113	151.78	AC	250	1969		0	0	Institutional	10	8	3	0	21
10709	WTRMA004323	1.62	AC	200	1973		0	0	SF - Residential	1	8	3	0	12
10711	WTRMA004324	13.81	AC	250	1973		0	0	SF - Residential	1	8	3	0	12
10717	WTRMA004083	0.88	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
10719	WTRMA004711	35.05	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
10729	WTRMA004019	5.68	AC	200	1974		0	0	Industrial	7	8	3	5	23
10731	WTRMA004706	6.35	AC	200	1969		0	0	Institutional	10	8	3	0	21
10733	WTRMA004705	6.43	AC	200	1969		0	0	Institutional	10	8	3	0	21
10735	WTRMA004701	9.14	AC	200	1969		0	0	SF - Residential	1	8	3	0	12
10737	WTRMA004704	6.40	AC	150	1983		0	0	SF - Residential	1	6	3	0	10
10739	WTRMA004700	171.76	AC	200	1969		0	0	SF - Residential	1	8	3	0	12
10741	WTRMA004703	57.38	AC	200	1969		0	0	SF - Residential	1	8	3	0	12
10743	WTRMA004702	6.12	AC	200	1969		0	0	SF - Residential	1	8	3	0	12
10745	WTRMA004699	13.68	AC	200	1969		0	0	SF - Residential	1	8	3	5	17
10751	WTRMA003370	75.74	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
10753	WTRMA003765	5.99	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
10755	WTRMA003764	8.72	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
10759	WTRMA003757	19.64	AC	150	1978		0	0	Commercial	8	6	3	0	17
10763	WTRMA003760	228.70	AC	150	1978		0	0	Commercial	8	6	3	0	17
10765	WTRMA002777	1.00	PVC	200	1983		0	0	Commercial	8	6	1	0	15
10767	WTRMA002767	1.07	PVC	300	1983		0	0	Industrial	7	6	1	0	14
10769	WTRMA002765	1.04	PVC	300	1983		0	0	Industrial	7	6	1	0	14
10771	WTRMA002497	2.00	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
10779	WTRMA001833	2.77	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
10787	WTRMA001751	12.08	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
10791	WTRMA001753	5.75	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
10793	WTRMA001765	6.47	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
10799	WTRMA001768	11.83	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
10803	WTRMA004319	68.48	AC	200	1972		0	0	SF - Residential	1	8	3	0	12
10805	WTRMA004320	6.75	AC	200	1972		0	0	SF - Residential	1	8	3	0	12
10807	WTRMA004318	18.52	AC	200	1972		0	0	SF - Residential	1	8	3	0	12
10809	WTRMA004321	6.53	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
10811	WTRMA004269	85.11	AC	200	1966		0	0	SF - Residential	1	8	3	0	12
10813	WTRMA004310	6.54	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
10815	WTRMA004106	6.32	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
10817	WTRMA004107	163.72	AC	150	1965		0	0	Commercial	8	10	3	0	21
10819	WTRMA004110	20.36	AC	150	1965		0	0	Commercial	8	10	3	0	21
10821	WTRMA004111	162.10	AC	150	1965		0	0	Commercial	8	10	3	0	21
10823	WTRMA004086	25.13	AC	200	1967		0	0	Commercial	8	8	3	0	24
10825	WTRMA004082	4.29	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
10827	WTRMA004081	21.30	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
10829	WTRMA004095	7.01	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
10831	WTRMA004765	2.46	AC	200	1967		0	0	Institutional	10	8	3	0	21
10833	WTRMA000062	3.00	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
10835	WTRMA000061	19.84	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
10837	WTRMA000276	22.44	PVC	250	1990		0	0	Commercial	8	4	1	0	13
10841	WTRMA004311	73.02	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
10843	WTRMA004312	12.80	AC	150	1972		0	0	Institutional & SF - Residential	10	8	3	0	21
10845	WTRMA004313	5.36	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
10847	WTRMA004316	15.10	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
10851	WTRMA004314	6.90	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
10855	WTRMA004084	14.31	AC	200	1967		0	0	Commercial	8	8	3	0	19
10857	WTRMA004078	14.89	PVC	250	1989		0	0	SF - Residential	1	4	1	0	6
10859	WTRMA004090	13.80	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
10861	WTRMA004094	203.22	AC	200	1968		1	6	SF - Residential	1	8	3	0	18
10863	WTRMA004763	0.82	AC	200	1967		0	0	Institutional	10	8	3	0	21
10865	WTRMA004762	6.36	AC	200	1967		0	0	Institutional	10	8	3	0	21
10867	WTRMA004654	6.40	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
10869	WTRMA004653	13.72	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
10871	WTRMA004652	28.18	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
10873	WTRMA000230	50.28	AC	200	1973		0	0	SF - Residential	1	8	3	0	12
10875	WTRMA004645	17.64	AC	200	1973		0	0	Institutional	10	8	3	0	21
10877	WTRMA004644	182.43	AC	200	1973		0	0	Institutional	10	8	3	0	21
10879	WTRMA004643	13.71	AC	200	1973		0	0	SF - Residential	1	8	3	0	12
10881	WTRMA003617	79.53	AC	200	1973		0	0	SF - Residential	1	8	3	0	12
10883	WTRMA000973	86.87	AC	200	1973		0	0	SF - Residential	1	8	3	0	12
10885	WTRMA000235	6.37	AC	200	1973		0	0	SF - Residential	1	8	3	0	12
10893	WTRMA004640	6.33	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
10903	WTRMA004631	6.95	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
10911	WTRMA004620	8.27	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
10917	WTRMA004622	2.73	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
10919	WTRMA004625	6.17	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
10923	WTRMA004615	4.29	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
10933	WTRMA003767	7.14	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
10935	WTRMA001747	6.53	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
10937	WTRMA001748	11.80	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
10941	WTRMA001750	6.50	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
10943	WTRMA001724	5.93	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
10945	WTRMA001691	2.11	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
10947	WTRMA001690	15.18	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
10951	WTRMA001695	5.84	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
10953	WTRMA003749	6.33	CI	150	1947		0	0	Commercial	8	12	10	0	30
10955	WTRMA003750	5.85	CI	150	1964		0	0	Commercial	8	10	10	0	28
10957	WTRMA003733	1.55	PVC	250	2007		0	0	Industrial	7	0	1	0	8
10961	WTRMA003729	2.86	PVC	250	2007		0	0	Industrial	7	0	1	0	8
10965	WTRMA003725	2.86	PVC	250	2007		0	0	Industrial	7	0	1	0	8
10967	WTRMA003724	107.24	PVC	250	2007		0	0	Industrial	7	0	1	0	8
10969	WTRMA003721	2.76	PVC	250	2007		0	0	Industrial	7	0	1	0	8
10971	WTRMA003720	63.39	PVC	250	2007		0	0	Industrial	7	0	1	0	8
10973	WTRMA004612	3.20	PVC	400	2007		0	0	Industrial	12	0	1	0	13
10975	WTRMA004611	89.98	PVC	400	2007		0	0	Industrial	12	0	1	0	13

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
10977	WTRMA004610	5.15	PVC	400	2007		0	0	Industrial	12	0	1	0	13
10979	WTRMA004609	91.25	PVC	400	2007		0	0	Industrial	12	0	1	0	13
10981	WTRMA004608	2.96	PVC	400	2007		0	0	Industrial	12	0	1	0	13
10983	WTRMA004607	18.26	PVC	400	2007		0	0	Industrial	12	0	1	0	13
10985	WTRMA004613	88.33	PVC	400	2007		0	0	Industrial	12	0	1	0	13
10987	WTRMA004600	2.60	PVC	150	2007		0	0	Commercial	8	0	1	0	9
10989	WTRMA004601	83.43	PVC	150	2007		1	6	Commercial	8	0	1	0	15
10991	WTRMA004596	4.02	AC	150	1982		0	0	Institutional	10	6	3	0	19
10993	WTRMA004595	3.34	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
10995	WTRMA004590	4.12	PVC	150	2007		0	0	SF - Residential	1	0	1	20	22
10997	WTRMA004591	7.00	PVC	150	2007		0	0	SF - Residential	1	0	1	0	2
10999	WTRMA004592	44.28	PVC	150	2007		0	0	SF - Residential	1	0	1	0	2
11001	WTRMA004593	20.00	PVC	150	2004		1	6	SF - Residential	1	2	1	0	10
11003	WTRMA004594	57.76	PVC	150	2007		1	6	SF - Residential	1	0	1	0	8
11009	WTRMA004606	54.47	PVC	250	2007		0	0	Industrial	7	0	1	0	8
11011	WTRMA003367	2.30	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11013	WTRMA003368	97.91	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11023	WTRMA004597	16.44	PVC	150	2007		0	0	Commercial	8	0	1	0	9
11025	WTRMA004598	1.50	PVC	150	2007		0	0	Commercial	8	0	1	0	9
11027	WTRMA004599	197.65	PVC	150	2007		1	6	Commercial	8	0	1	0	15
11029	WTRMA003751	78.62	CI	150	1964		2	12	Commercial	8	10	10	0	40
11045	WTRMA002479	1.01	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
11047	WTRMA002478	3.91	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
11109	WTRMA003748	25.16	PVC	250	2007		0	0	Industrial	7	0	1	0	8
11111	WTRMA003745	2.91	PVC	250	2007		0	0	Industrial	7	0	1	0	8
11115	WTRMA003741	2.92	PVC	250	2007		0	0	Industrial	7	0	1	0	8
11117	WTRMA003740	109.01	PVC	250	2007		0	0	Industrial	7	0	1	0	8
11119	WTRMA003737	2.97	PVC	250	2007		0	0	Industrial	7	0	1	0	8
11129	WTRMA004567	12.34	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11141	WTRMA004536	12.29	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
11153	WTRMA004531	1.66	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
11157	WTRMA004528	4.93	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
11165	WTRMA004524	1.89	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11169	WTRMA004526	6.48	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11181	WTRMA004514	2.28	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11187	WTRMA004510	6.00	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11189	WTRMA004538	6.14	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
11203	WTRMA002285	5.90	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
11205	WTRMA004496	25.61	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
11223	WTRMA004500	9.81	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11233	WTRMA004509	6.23	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11253	WTRMA004576	3.23	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11255	WTRMA004579	69.32	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11261	WTRMA004580	15.46	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11263	WTRMA004585	5.55	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
11267	WTRMA004575	11.23	PVC	200	2007		0	0	SF - Residential	1	0	1	10	12
11271	WTRMA004574	12.16	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11275	WTRMA004569	5.42	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11283	WTRMA004563	1.55	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11293	WTRMA004558	5.80	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11303	WTRMA004551	10.43	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11307	WTRMA004557	6.20	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11315	WTRMA004550	5.91	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
11317	WTRMA004548	5.83	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
11319	WTRMA004489	3.17	PVC	250	2007		0	0	Institutional	10	0	1	0	11
11329	WTRMA004460	6.35	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11335	WTRMA004485	0.78	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11357	WTRMA002150	68.21	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
11363	WTRMA002140	6.59	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
11373	WTRMA002131	5.74	PVC	150	1985		0	0	SF - Residential	1	6	1	5	13
11381	WTRMA002117	2.70	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
11385	WTRMA002126	86.53	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
11387	WTRMA002122	11.80	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
11389	WTRMA002151	13.52	PVC	150	1985		0	0	SF - Residential	1	6	1	5	13
11391	WTRMA002147	11.83	PVC	150	1985		0	0	SF - Residential	1	6	1	5	13
11401	WTRMA002142	6.35	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
11407	WTRMA002138	1.47	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
11417	WTRMA004481	7.71	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11419	WTRMA004480	6.08	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11429	WTRMA004453	8.48	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
11451	WTRMA004467	6.33	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11455	WTRMA004461	8.82	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11461	WTRMA004445	8.85	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
11471	WTRMA004456	9.42	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
11479	WTRMA004468	11.46	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
11481	WTRMA002048	11.13	AC	200	1977		0	0	Institutional	10	6	3	0	19
11483	WTRMA002096	14.93	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11485	WTRMA002081	35.08	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11487	WTRMA002079	214.20	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
11489	WTRMA002080	2.01	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
11491	WTRMA002077	6.83	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
11495	WTRMA002076	30.95	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
11497	WTRMA002075	22.21	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
11499	WTRMA002074	16.52	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
11503	WTRMA002072	8.29	AC	200	1977		0	0	Institutional	10	6	3	0	19
11505	WTRMA002068	6.19	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
11511	WTRMA002070	13.55	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
11513	WTRMA002069	6.14	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
11515	WTRMA002071	61.66	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
11517	WTRMA002065	2.18	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
11519	WTRMA002061	46.96	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
11521	WTRMA002063	6.19	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
11523	WTRMA002062	13.54	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
11525	WTRMA002064	78.29	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
11527	WTRMA002059	46.77	AC	200	1977		0	0	Institutional	10	6	3	0	19
11529	WTRMA002057	13.49	AC	200	1977		0	0	Institutional	10	6	3	0	19
11531	WTRMA002058	7.17	AC	200	1977		0	0	Institutional	10	6	3	0	19
11533	WTRMA002053	136.96	AC	200	1977		0	0	Institutional	10	6	3	0	19

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
11539	WTRMA002050	6.75	AC	200	1977		0	0	Institutional	10	6	3	0	19
11541	WTRMA002049	5.43	AC	200	1977		0	0	Institutional	10	6	3	0	19
11543	WTRMA002056	5.89	AC	200	1977		0	0	Institutional	10	6	3	0	19
11545	WTRMA002060	7.81	AC	200	1977		0	0	Institutional	10	6	3	0	19
11547	WTRMA002047	2.92	PVC	300	1997		0	0	Industrial	7	2	1	0	10
11549	WTRMA002039	13.70	PVC	300	1997		0	0	Industrial	7	2	1	0	10
11553	WTRMA002045	29.71	PVC	300	1997		0	0	Industrial	7	2	1	0	10
11557	WTRMA002005	13.11	PVC	300	1999		0	0	Commercial	8	2	1	0	11
11559	WTRMA002029	60.90	PVC	300	2002		0	0	Commercial	8	2	1	0	11
11561	WTRMA002031	54.17	PVC	300	2002		0	0	Commercial	8	2	1	0	11
11563	WTRMA002026	141.79	PVC	500	1999		0	0	Commercial	13	2	1	0	16
11565	WTRMA002027	2.17	PVC	300	1999		0	0	Commercial	8	2	1	0	11
11567	WTRMA002024	5.50	PVC	200	1999		0	0	Commercial	8	2	1	0	11
11569	WTRMA002025	6.00	PVC	200	1999		0	0	Commercial	8	2	1	0	11
11571	WTRMA002023	1.82	PVC	150	1999		0	0	Commercial	8	2	1	0	11
11573	WTRMA002022	114.70	PVC	500	1999		0	0	Commercial	13	2	1	0	16
11575	WTRMA002016	5.50	PVC	200	1999		0	0	Commercial	8	2	1	0	11
11583	WTRMA002046	61.60	PVC	300	1997		0	0	Industrial	7	2	1	0	10
11601	WTRMA002119	13.91	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
11603	WTRMA002118	6.20	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
11605	WTRMA002120	49.17	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
11607	WTRMA002123	4.50	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
11609	WTRMA002121	8.34	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
11611	WTRMA002110	49.67	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
11617	WTRMA002109	6.61	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
11621	WTRMA002106	154.29	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
11625	WTRMA002108	165.68	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
11627	WTRMA002103	6.14	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
11629	WTRMA002107	16.54	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
11631	WTRMA002113	43.59	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
11633	WTRMA002102	15.29	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
11635	WTRMA002114	33.67	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
11637	WTRMA002101	37.41	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11639	WTRMA002100	12.86	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11641	WTRMA002099	80.93	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11643	WTRMA002098	12.57	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11645	WTRMA002097	81.17	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11649	WTRMA002094	8.95	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11651	WTRMA002083	6.32	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11655	WTRMA002087	144.21	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11661	WTRMA002082	13.95	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11663	WTRMA002084	5.96	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11667	WTRMA002090	9.87	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11671	WTRMA002091	15.54	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11673	WTRMA002093	96.47	AC	200	1978		0	0	Institutional	10	6	3	0	19
11675	WTRMA002092	9.01	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
11677	WTRMA002017	6.00	PVC	200	1999		0	0	Commercial	8	2	1	0	11
11679	WTRMA002020	5.50	PVC	200	1999		0	0	Commercial	8	2	1	0	11
11681	WTRMA002021	6.00	PVC	200	1999		0	0	Commercial	8	2	1	0	11
11683	WTRMA002019	1.82	PVC	150	1999		0	0	Commercial	8	2	1	0	11
11685	WTRMA002018	111.10	PVC	500	1999		0	0	Commercial	13	2	1	0	16
11687	WTRMA002015	1.82	PVC	150	1999		0	0	Commercial	8	2	1	0	11
11689	WTRMA002014	100.70	PVC	500	1999		0	0	Commercial	13	2	1	0	16
11691	WTRMA002012	5.50	PVC	200	1999		0	0	Commercial	8	2	1	0	11
11693	WTRMA002011	1.82	PVC	150	1999		0	0	Commercial	8	2	1	0	11
11695	WTRMA002010	38.89	PVC	500	1999		0	0	Commercial	13	2	1	0	16
11701	WTRMA001978	1.78	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11703	WTRMA001977	14.84	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11711	WTRMA001973	12.22	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11715	WTRMA001971	6.24	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
11721	WTRMA001959	2.25	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
11723	WTRMA001963	5.76	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
11729	WTRMA001964	2.31	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
11733	WTRMA001952	17.44	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
11739	WTRMA001968	6.26	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
11751	WTRMA001954	2.43	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
11753	WTRMA001958	6.07	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
11757	WTRMA002013	6.00	PVC	200	1999		0	0	Commercial	8	2	1	0	11
11759	WTRMA002006	3.14	PVC	400	1999		0	0	Commercial	13	2	1	0	16
11761	WTRMA002008	1.50	PVC	300	1999		0	0	Commercial	8	2	1	0	11
11763	WTRMA002007	1.50	PVC	300	1999		0	0	Commercial	8	2	1	0	11
11765	WTRMA002009	3.97	PVC	500	1999		0	0	Commercial	13	2	1	0	16
11767	WTRMA002004	10.87	PVC	300	1999		0	0	Commercial	8	2	1	0	11
11769	WTRMA002003	12.95	PVC	300	1999		0	0	Commercial	8	2	1	0	11
11771	WTRMA002758	4.00	PVC	300	2004		0	0	Commercial	8	2	1	0	11
11777	WTRMA002002	28.18	PVC	400	1999		0	0	Commercial	13	2	1	0	16
11779	WTRMA001999	1.56	PVC	400	1999		0	0	SF - Residential	6	2	1	0	9
11781	WTRMA001983	0.50	PVC	400	2002		0	0	Commercial	13	2	1	0	16
11783	WTRMA001998	1.58	PVC	400	1999		0	0	SF - Residential	6	2	1	0	9
11787	WTRMA001990	73.46	PVC	400	1999		0	0	Commercial	13	2	1	0	16
11791	WTRMA001996	67.54	PVC	400	1999		0	0	Commercial	13	2	1	0	16
11795	WTRMA001991	1.50	PVC	300	1999		0	0	Commercial	8	2	1	0	11
11797	WTRMA001993	1.37	PVC	400	1999		0	0	Commercial	13	2	1	0	16
11799	WTRMA001992	1.50	PVC	300	1999		0	0	Commercial	8	2	1	0	11
11801	WTRMA001987	1.50	PVC	300	1999		0	0	Commercial	8	2	1	0	11
11803	WTRMA001989	1.51	PVC	400	1999		0	0	Commercial	13	2	1	0	16
11805	WTRMA001988	1.50	PVC	300	1999		0	0	Commercial	8	2	1	0	11
11807	WTRMA001986	127.22	PVC	400	1999		0	0	Commercial	13	2	1	0	16
11809	WTRMA001984	0.76	PVC	300	2002		0	0	Commercial	8	2	1	0	11
11811	WTRMA001985	0.75	PVC	300	2002		0	0	Commercial	8	2	1	0	11
11813	WTRMA001982	12.64	PVC	400	2002		0	0	Commercial	13	2	1	0	16
11815	WTRMA001981	21.78	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11823	WTRMA001915	6.12	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
11849	WTRMA001899	2.87	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11851	WTRMA001898	12.08	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11857	WTRMA001893	1.73	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11863	WTRMA001892	13.29	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11865	WTRMA001891	2.06	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
11867	WTRMA001889	7.57	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11869	WTRMA001890	1.93	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11871	WTRMA001879	12.51	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11877	WTRMA001875	3.60	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11881	WTRMA001874	14.75	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11883	WTRMA001873	8.77	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
11889	WTRMA001869	7.89	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
11893	WTRMA001907	5.31	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11895	WTRMA001906	46.68	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11897	WTRMA001908	13.43	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11899	WTRMA001885	7.35	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11901	WTRMA001884	12.26	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11913	WTRMA001949	1.30	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
11915	WTRMA001947	5.97	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
11917	WTRMA001941	5.81	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11923	WTRMA001943	2.42	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
11935	WTRMA001933	17.49	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11939	WTRMA001938	8.13	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11951	WTRMA001925	15.32	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11959	WTRMA001936	3.09	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
11965	WTRMA001920	6.50	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
12003	WTRMA001820	3.85	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
12005	WTRMA001807	5.79	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
12009	WTRMA001806	8.76	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
12015	WTRMA001785	6.76	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
12017	WTRMA001783	9.31	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
12023	WTRMA001787	6.65	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
12033	WTRMA003555	3.04	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
12035	WTRMA001803	1.95	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
12041	WTRMA001804	11.90	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
12045	WTRMA001798	11.83	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
12053	WTRMA001799	5.97	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
12057	WTRMA001793	38.33	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
12069	WTRMA001852	21.48	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
12071	WTRMA001792	5.02	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
12085	WTRMA001849	64.40	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
12087	WTRMA001831	4.98	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
12091	WTRMA001854	12.34	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
12093	WTRMA001840	6.78	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
12095	WTRMA001838	15.32	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
12097	WTRMA001839	8.97	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
12099	WTRMA001837	2.44	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
12103	WTRMA001826	5.77	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
12111	WTRMA001821	9.17	PVC	300	2001		0	0	SF - Residential	1	2	1	0	4
12115	WTRMA001816	14.74	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
12125	WTRMA001741	11.60	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12131	WTRMA001733	1.17	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12139	WTRMA001729	4.99	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12157	WTRMA001719	6.34	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12159	WTRMA001718	6.37	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12161	WTRMA001717	70.82	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12167	WTRMA001714	2.36	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12171	WTRMA001712	68.72	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12173	WTRMA001711	12.01	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12175	WTRMA001706	75.50	PVC	300	1998		0	0	Commercial	8	2	1	0	11
12183	WTRMA001707	17.91	PVC	300	1998		0	0	Commercial	8	2	1	0	11
12193	WTRMA001702	15.13	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12201	WTRMA001681	15.24	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
12205	WTRMA001680	9.20	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
12207	WTRMA001700	6.20	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
12215	WTRMA001696	2.86	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
12221	WTRMA001689	9.40	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
12223	WTRMA003009	45.39	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
12229	WTRMA001780	12.08	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12231	WTRMA001779	2.69	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12233	WTRMA001781	5.91	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12239	WTRMA001777	12.08	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
12241	WTRMA001776	10.90	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12245	WTRMA001775	18.31	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12255	WTRMA001766	9.56	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12257	WTRMA001767	45.52	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12267	WTRMA001758	11.70	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12271	WTRMA001763	1.37	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12275	WTRMA001757	6.07	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12279	WTRMA001745	10.20	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12289	WTRMA001737	1.99	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12293	WTRMA001736	15.52	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12299	WTRMA001678	31.33	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
12311	WTRMA001673	9.32	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
12313	WTRMA001669	15.96	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
12319	WTRMA001626	11.05	PVC	400	1997		0	0	SF - Residential	6	2	1	0	9
12323	WTRMA001634	8.05	PVC	400	1997		0	0	SF - Residential	6	2	1	0	9
12325	WTRMA001668	14.46	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
12327	WTRMA001674	14.08	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
12329	WTRMA001629	6.26	PVC	400	1997		0	0	SF - Residential	6	2	1	0	9
12331	WTRMA001625	32.23	PVC	400	1997		0	0	SF - Residential	6	2	1	0	9
12333	WTRMA001646	8.20	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
12341	WTRMA001610	12.76	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
12345	WTRMA001607	5.60	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
12355	WTRMA001620	6.17	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
12363	WTRMA001627	6.67	PVC	400	1997		0	0	SF - Residential	6	2	1	0	9
12371	WTRMA001621	1.52	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
12389	WTRMA001666	2.38	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
12391	WTRMA001667	9.41	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
12399	WTRMA001650	4.86	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
12435	WTRMA001645	5.11	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
12439	WTRMA001636	15.26	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
12441	WTRMA001628	84.46	PVC	400	1997		0	0	SF - Residential	6	2	1	0	9

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
12445	WTRMA001633	80.47	PVC	400	1997		0	0	SF - Residential	6	2	1	0	9
12449	WTRMA001630	4.27	PVC	400	1997		0	0	SF - Residential	6	2	1	0	9
12457	WTRMA001580	16.00	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12461	WTRMA001557	5.47	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12463	WTRMA001554	11.96	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12465	WTRMA001555	80.27	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12473	WTRMA001546	1.63	PVC	200	1998		0	0	Institutional	10	2	1	0	13
12475	WTRMA001547	58.56	PVC	200	1998		0	0	Institutional	10	2	1	0	13
12479	WTRMA001558	12.03	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12481	WTRMA001574	39.49	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12483	WTRMA001576	44.98	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12485	WTRMA001556	42.51	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12487	WTRMA001589	83.46	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12489	WTRMA001549	12.00	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12491	WTRMA001550	8.30	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12493	WTRMA001544	5.58	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
12505	WTRMA001536	9.29	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
12507	WTRMA001535	5.45	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
12517	WTRMA001522	38.14	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
12525	WTRMA001517	5.59	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
12527	WTRMA001519	23.16	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
12535	WTRMA001510	11.73	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
12559	WTRMA001600	10.82	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
12561	WTRMA001597	12.25	PVC	400	1994		0	0	SF - Residential	6	4	1	0	11
12563	WTRMA001599	40.80	PVC	400	1994		0	0	SF - Residential	6	4	1	0	11
12565	WTRMA001598	6.08	PVC	400	1994		0	0	SF - Residential	6	4	1	0	11
12567	WTRMA001601	5.84	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
12569	WTRMA001596	134.35	PVC	400	1994		0	0	SF - Residential	6	4	1	0	11
12583	WTRMA001587	7.08	PVC	150	1998		0	0	SF - Residential	1	2	1	0	4
12585	WTRMA001586	4.26	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12587	WTRMA001588	1.00	PVC	150	1998		0	0	SF - Residential	1	2	1	0	4
12589	WTRMA001585	13.76	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12591	WTRMA001583	6.01	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12593	WTRMA001582	12.00	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12595	WTRMA001579	6.00	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12599	WTRMA001571	2.11	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12603	WTRMA001570	12.00	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12605	WTRMA001575	11.99	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12607	WTRMA001577	11.83	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
12629	WTRMA000293	74.35	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
12631	WTRMA000292	5.90	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
12635	WTRMA000290	5.02	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
12641	WTRMA000284	6.33	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
12645	WTRMA000285	13.09	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
12649	WTRMA000281	95.57	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
12651	WTRMA000277	6.60	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
12653	WTRMA000278	67.00	CI	150	1961	1993	0	0	N/A	0	0	0	0	0
12655	WTRMA000094	20.41	AC	250	1982		0	0	Industrial	7	6	3	0	16
12661	WTRMA000089	0.57	AC	150	1982		0	0	Industrial	7	6	3	0	16
12665	WTRMA000106	1.59	AC	250	1982		0	0	Industrial	7	6	3	0	16
12667	WTRMA000088	0.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
12671	WTRMA000069	13.07	AC	400	1982		0	0	SF - Residential	6	6	3	0	15
12673	WTRMA000060	3.00	AC	400	1982		0	0	SF - Residential	6	6	3	0	15
12675	WTRMA000068	99.52	AC	400	1982		0	0	SF - Residential	6	6	3	0	15
12677	WTRMA000059	2.00	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
12679	WTRMA000057	1.50	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
12683	WTRMA000584	6.79	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
12687	WTRMA000586	78.18	TRAN	150	1940		1	6	Commercial	8	14	1	0	29
12689	WTRMA000585	13.98	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
12691	WTRMA000608	121.48	TRAN	200	1940		0	0	Commercial	8	14	1	0	23
12693	WTRMA000581	12.87	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
12695	WTRMA000659	3.67	TRAN	200	1940		0	0	Commercial	8	14	1	0	23
12697	WTRMA000597	7.53	TRAN	200	1940		0	0	Commercial	8	14	1	0	23
12701	WTRMA000601	6.92	TRAN	200	1940		0	0	Commercial	8	14	1	0	23
12705	WTRMA000602	157.44	TRAN	200	1940		1	6	Commercial	8	14	1	0	29
12707	WTRMA000603	5.41	TRAN	200	1940		0	0	Commercial	8	14	1	0	23
12711	WTRMA000405	68.21	AC	300	1975		0	0	Industrial	7	8	3	0	18
12715	WTRMA000379	107.31	AC	300	1975		1	6	Commercial	8	8	3	0	25
12719	WTRMA000385	1.00	AC	300	1975		0	0	Commercial	8	8	3	0	19
12721	WTRMA000387	174.78	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
12723	WTRMA000386	5.64	AC	300	1975		0	0	Commercial	8	8	3	0	19
12725	WTRMA000381	7.39	AC	300	1975		0	0	Commercial	8	8	3	0	19
12727	WTRMA000359	1.28	AC	200	1975		0	0	Industrial	7	8	3	0	18
12731	WTRMA000366	9.40	AC	300	1975		0	0	Industrial	7	8	3	0	18
12733	WTRMA000303	13.48	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
12735	WTRMA000280	6.27	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
12737	WTRMA000268	13.46	PVC	300	1990		0	0	Commercial & SF - Residential	8	4	1	0	13
12745	WTRMA000275	4.05	PVC	250	1990		0	0	Commercial	8	4	1	0	13
12747	WTRMA000266	14.18	PVC	200	1990		0	0	Commercial & SF - Residential	8	4	1	0	13
12751	WTRMA000267	3.53	PVC	150	1990		0	0	Commercial & SF - Residential	8	4	1	0	13
12753	WTRMA000272	6.10	PVC	250	1990		0	0	Commercial	8	4	1	0	13
12755	WTRMA000264	1.93	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
12759	WTRMA000058	1.50	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
12761	WTRMA000056	92.37	PVC	400	1985		0	0	Institutional	15	6	1	0	22
12763	WTRMA000054	1.50	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
12765	WTRMA000055	83.68	PVC	400	1985		0	0	Institutional	15	6	1	0	22
12767	WTRMA000053	1.53	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
12771	WTRMA000050	0.70	AC	400	1982		0	0	Commercial	13	6	3	0	22

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
12773	WTRMA000049	4.00	AC	300	1982		0	0	Commercial	8	6	3	0	17
12775	WTRMA000052	13.67	AC	400	1982		0	0	SF - Residential	6	6	3	0	15
12779	WTRMA000037	1.25	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
12783	WTRMA000036	9.65	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
12785	WTRMA000066	6.02	TRAN	200	1940		0	0	Commercial	8	14	1	0	23
12791	WTRMA000582	81.49	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
12793	WTRMA000580	7.23	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
12799	WTRMA000577	5.72	TRAN	150	1940		0	0	Commercial & industrial	8	14	1	5	28
12803	WTRMA000578	6.09	TRAN	150	1940		0	0	Commercial & industrial	8	14	1	5	28
12805	WTRMA000613	14.23	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
12807	WTRMA000609	35.77	TRAN	150	1940	1995	0	0	N/A	0	0	0	0	0
12809	WTRMA000598	59.23	TRAN	200	1940		0	0	Commercial	8	14	1	0	23
12811	WTRMA000350	4.00	PVC	400	1995		0	0	SF - Residential	6	4	1	0	11
12817	WTRMA000331	74.45	AC	400	1975		0	0	Commercial	13	8	3	0	24
12819	WTRMA000435	53.34	STL	300	1975		0	0	Industrial	7	8	1	0	16
12821	WTRMA000434	8.00	AC	300	1975		0	0	Industrial	7	8	3	0	18
12823	WTRMA000433	6.44	AC	300	1975		0	0	Industrial	7	8	3	0	18
12825	WTRMA000397	8.84	AC	300	1975		0	0	Industrial	7	8	3	0	18
12827	WTRMA000504	7.93	AC	250	1975		0	0	Commercial	8	8	3	0	19
12829	WTRMA000501	1.00	AC	250	1975		0	0	Commercial	8	8	3	0	19
12831	WTRMA000502	7.97	AC	250	1975		0	0	Commercial	8	8	3	0	19
12833	WTRMA000505	73.46	AC	250	1975		0	0	Commercial	8	8	3	0	19
12837	WTRMA000262	3.36	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
12841	WTRMA000261	3.00	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6
12843	WTRMA000260	0.61	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6
12849	WTRMA000256	2.94	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6
12851	WTRMA000255	4.45	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
12853	WTRMA000279	95.15	PVC	200	1993		1	6	SF - Residential	1	4	1	0	12
12855	WTRMA000254	3.24	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
12857	WTRMA000253	9.69	PVC	250	1990		0	0	SF - Residential	1	4	1	0	6
12859	WTRMA000252	79.88	PVC	250	1990		0	0	SF - Residential	1	4	1	0	6
12861	WTRMA000044	21.51	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
12877	WTRMA000065	1.50	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
12879	WTRMA000063	1.00	AC	400	1982		0	0	SF - Residential	6	6	3	0	15
12881	WTRMA000028	8.30	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
12889	WTRMA000607	13.20	TRAN	200	1940		0	0	Commercial	8	14	1	0	23
12891	WTRMA000621	13.59	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
12895	WTRMA000684	15.02	CI	150	1947		0	0	Commercial	8	12	10	5	35
12901	WTRMA000637	6.09	CI	150	1947		0	0	Commercial	8	12	10	0	30
12903	WTRMA000687	6.06	CI	150	1947		0	0	Commercial	8	12	10	0	30
12905	WTRMA000686	14.92	CI	150	1947		0	0	Commercial	8	12	10	5	35
12909	WTRMA000675	14.04	CI	150	1947		0	0	Commercial	8	12	10	0	30
12911	WTRMA000680	26.25	CI	150	1947		0	0	SF - Residential	1	12	10	0	23
12913	WTRMA000653	55.84	CI	150	1947		0	0	Commercial	8	12	10	0	30
12931	WTRMA000492	381.37	AC	250	1975		0	0	SF - Residential	1	8	3	0	12
12933	WTRMA000489	0.61	AC	300	1975		0	0	Parks, open space and trails	1	8	3	0	12
12935	WTRMA000488	0.91	AC	200	1975		0	0	Parks, open space and trails	1	8	3	0	12
12937	WTRMA000487	0.61	AC	200	1975		0	0	Parks, open space and trails	1	8	3	0	12
12939	WTRMA000251	6.58	PVC	250	1990		0	0	SF - Residential	1	4	1	0	6
12941	WTRMA000250	32.72	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6
12943	WTRMA000245	2.50	PVC	250	1990		0	0	Commercial	8	4	1	0	13
12945	WTRMA000246	86.31	PVC	250	1990		0	0	Commercial	8	4	1	0	13
12947	WTRMA000249	84.73	PVC	250	1990		0	0	SF - Residential	1	4	1	0	6
12949	WTRMA000248	6.09	PVC	250	1990		0	0	SF - Residential	1	4	1	0	6
12951	WTRMA000247	1.50	PVC	150	1990		0	0	Commercial	8	4	1	0	13
12953	WTRMA000244	13.37	PVC	200	1987		0	0	SF - Residential	1	4	1	0	6
12957	WTRMA000243	19.29	PVC	250	1989		0	0	Commercial	8	4	1	10	23
12959	WTRMA000240	140.30	PVC	250	1989		0	0	Commercial	8	4	1	0	13
12961	WTRMA000239	3.44	PVC	250	1989		0	0	Commercial	8	4	1	0	13
12963	WTRMA000236	145.41	PVC	150	1989		1	6	SF - Residential	1	4	1	0	12
12965	WTRMA000035	180.50	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
12969	WTRMA000067	2.40	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
12979	WTRMA000022	20.41	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
12985	WTRMA000019	0.70	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
12987	WTRMA000005	9.93	AC	400	1982		0	0	Commercial	13	6	3	0	22
12991	WTRMA000068	8.26	CI	150	1947		1	6	Commercial	8	12	10	0	36
12995	WTRMA0000654	14.25	CI	150	1947		0	0	Commercial	8	12	10	0	30
12997	WTRMA0000650	7.72	CI	150	1947		0	0	Institutional & Commercial	10	12	10	10	42
12999	WTRMA000622	79.57	TRAN	150	1940		1	6	Commercial	8	14	1	0	29
13001	WTRMA000664	14.38	CI	150	1947		0	0	Commercial	8	12	10	0	30
13003	WTRMA000663	178.93	CI	150	1947		2	12	Commercial	8	12	10	0	42
13005	WTRMA000660	3.96	CI	150	1947		0	0	Commercial	8	12	10	0	30
13007	WTRMA000641	4.26	CI	150	1947		0	0	Commercial	8	12	10	0	30
13009	WTRMA000642	6.10	CI	150	1947		0	0	Commercial	8	12	10	0	30
13013	WTRMA000646	47.27	CI	150	1947		1	6	Institutional	10	12	10	0	38
13015	WTRMA000649	2.13	CI	150	1947		0	0	Institutional	10	12	10	0	32
13017	WTRMA000490	1.00	AC	300	1975		0	0	Parks, open space and trails	1	8	3	0	12
13019	WTRMA000491	5.18	AC	250	1975		0	0	SF - Residential	1	8	3	0	12
13021	WTRMA000486	1.11	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13023	WTRMA000484	7.29	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13025	WTRMA000480	6.79	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13027	WTRMA000482	158.74	AC	300	1975		0	0	Commercial	8	8	3	0	19
13031	WTRMA000476	148.14	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13033	WTRMA000477	13.22	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13035	WTRMA000479	6.22	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13037	WTRMA000471	89.26	AC	300	1975		0	0	Institutional, commercial, SF-Residential	10	8	3	5	26
13039	WTRMA000472	0.83	AC	300	1975		0	0	Institutional	10	8	3	0	21
13041	WTRMA000238	0.47	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
13047	WTRMA000229	105.41	PVC	250	1989		0	0	Commercial	8	4	1	0	13
13057	WTRMA000231	6.27	PVC	250	1989		0	0	Commercial	8	4	1	0	13
13059	WTRMA000227	10.77	PVC	250	1989		0	0	Commercial	8	4	1	0	13
13061	WTRMA000226	12.20	PVC	150	1988		0	0	Commercial	8	4	1	0	13
13063	WTRMA000225	1.03	PVC	150	1988		0	0	Commercial	8	4	1	0	13
13067	WTRMA000014	0.57	AC	400	1982		0	0	Commercial	13	6	3	0	22
13071	WTRMA000011	13.22	AC	400	1982		0	0	Commercial & SF - residential	13	6	3	5	27
13075	WTRMA000001	2.11	AC	200	1982		0	0	SF - Residential	1	6	3	0	10
13077	WTRMA000002	1.50	AC	200	1982		0	0	SF - Residential	1	6	3	0	10
13079	WTRMA000003	1.50	AC	300	1982		0	0	Commercial	8	6	3	0	17
13081	WTRMA000004	0.66	AC	400	1982		0	0	Commercial	13	6	3	0	22
13083	WTRMA000048	1.20	AC	400	1982		0	0	Commercial	13	6	3	0	22
13085	WTRMA000082	98.76	CI	200	1960	1985	0	0	N/A	0	0	0	0	0
13093	WTRMA000628	6.66	CI	150	1947		0	0	Commercial	8	12	10	0	30
13095	WTRMA000595	14.12	TRAN	150	1940		0	0	Commercial	8	14	1	10	33
13099	WTRMA000629	144.56	CI	150	1947		3	18	Commercial	8	12	10	0	48
13103	WTRMA000632	17.05	CI	150	1947		0	0	Commercial	8	12	10	0	30
13109	WTRMA000636	2.13	CI	150	1947		0	0	Commercial	8	12	10	0	30
13113	WTRMA000627	2.11	CI	150	1947		0	0	Commercial	8	12	10	0	30
13119	WTRMA000475	1.00	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13121	WTRMA000473	38.41	STL	300	1975		0	0	SF - Residential	1	8	1	0	10
13123	WTRMA000478	1.49	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13125	WTRMA000468	92.47	AC	300	1975		0	0	Institutional, commercial, SF-Residential	10	8	3	5	26
13127	WTRMA000470	4.25	AC	150	1975		0	0	Institutional	10	8	3	0	21
13129	WTRMA000451	98.84	AC	300	1975		1	6	SF - Residential	1	8	3	5	23
13131	WTRMA000452	8.45	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13133	WTRMA000453	0.93	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13135	WTRMA000454	3.77	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13137	WTRMA000467	0.83	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
13139	WTRMA000465	1.00	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13141	WTRMA000466	0.83	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
13145	WTRMA000222	20.09	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
13151	WTRMA000219	12.81	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
13153	WTRMA000216	106.55	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
13155	WTRMA000213	126.89	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
13157	WTRMA000218	1.40	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
13159	WTRMA000215	21.11	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
13165	WTRMA000212	21.11	PVC	250	1988		0	0	Commercial	8	4	1	0	13
13181	WTRMA000775	14.95	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
13185	WTRMA000768	5.93	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
13187	WTRMA000767	14.38	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
13189	WTRMA000766	9.67	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
13191	WTRMA000623	1.50	PVC	300	2012		0	0	Commercial	8	0	1	0	9
13193	WTRMA000568	13.02	PVC	150	1994		0	0	Commercial	8	4	1	20	33
13195	WTRMA000572	3.42	PVC	150	1994		0	0	Commercial	8	4	1	0	13
13197	WTRMA000569	4.17	PVC	150	1994		0	0	Commercial	8	4	1	0	13
13201	WTRMA000566	10.79	PVC	150	1994		0	0	Commercial	8	4	1	0	13
13203	WTRMA000567	14.13	PVC	150	1994		0	0	Commercial	8	4	1	20	33
13205	WTRMA000573	3.93	PVC	150	1994		0	0	Commercial	8	4	1	0	13
13207	WTRMA000571	2.69	PVC	150	1994		0	0	Commercial	8	4	1	0	13
13213	WTRMA000558	2.50	AC	300	1982		0	0	Industrial	7	6	3	0	16
13215	WTRMA000464	1.00	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13217	WTRMA000461	2.59	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13219	WTRMA000460	5.79	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13221	WTRMA000448	1.22	AC	200	1975		0	0	SF - Residential	1	8	3	5	17
13223	WTRMA000449	1.22	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
13225	WTRMA000447	1.22	AC	200	1975		0	0	SF - Residential	1	8	3	5	17
13227	WTRMA000443	85.60	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13229	WTRMA000444	4.55	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13231	WTRMA000445	1.41	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13233	WTRMA000446	0.72	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13235	WTRMA000450	1.22	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
13241	WTRMA000209	14.06	PVC	150	1988		0	0	Commercial	8	4	1	0	13
13243	WTRMA000206	19.90	PVC	150	1988		0	0	Commercial	8	4	1	0	13
13245	WTRMA000202	135.40	PVC	300	1987		0	0	Institutional	10	4	1	0	15
13253	WTRMA000201	12.63	PVC	300	1987		0	0	Institutional	10	4	1	0	15
13255	WTRMA000200	1.70	PVC	300	2002		0	0	Institutional	10	2	1	0	13
13257	WTRMA000199	12.93	PVC	200	1986		0	0	Commercial	8	4	1	0	13
13259	WTRMA000198	87.29	PVC	200	1986		0	0	Commercial	8	4	1	0	13
13275	WTRMA000769	6.25	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
13277	WTRMA000760	4.48	PVC	150	2000		0	0	SF - Residential	1	2	1	0	4
13287	WTRMA000557	37.50	PVC	300	1982		0	0	Industrial	7	6	1	0	14
13289	WTRMA000556	12.50	AC	300	1982		0	0	Industrial	7	6	3	0	16
13291	WTRMA000555	12.50	AC	300	1982		0	0	Industrial	7	6	3	0	16
13295	WTRMA000544	27.25	AC	150	1980		0	0	Industrial	7	6	3	10	26
13297	WTRMA000521	5.01	PVC	200	2000		0	0	Industrial	7	2	1	0	10
13299	WTRMA000519	3.00	PVC	200	2000		0	0	Industrial	7	2	1	0	10
13301	WTRMA000518	15.63	PVC	200	2000		0	0	Industrial	7	2	1	0	10
13303	WTRMA000515	3.00	PVC	250	1998		0	0	Industrial	7	2	1	0	10
13305	WTRMA000513	19.54	PVC	250	1998		0	0	Industrial	7	2	1	0	10
13309	WTRMA000441	1.22	AC	150	1975		0	0	Commercial & SF - residential	8	8	5	5	26
13311	WTRMA000442	0.47	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
13313	WTRMA000437	0.85	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13315	WTRMA000438	0.98	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13317	WTRMA000436	116.77	AC	300	1975		0	0	Commercial	8	8	3	5	24
13319	WTRMA000474	1.28	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13325	WTRMA000430	119.55	AC	300	1975		0	0	Industrial	7	8	3	0	18
13329	WTRMA000429	3.91	AC	300	1975		0	0	Industrial	7	8	3	0	18
13331	WTRMA000427	20.69	AC	300	1975		0	0	Industrial	7	8	3	0	18
13339	WTRMA000182	1.86	PVC	250	1985		0	0	Commercial	8	6	1	0	15
13341	WTRMA000183	2.14	PVC	250	1985		0	0	Commercial	8	6	1	0	15
13345	WTRMA000188	1.00	PVC	200	1985		0	0	Commercial	8	6	1	0	15
13349	WTRMA000191	6.00	PVC	200	1985		0	0	Commercial	8	6	1	0	15

Note: The pipes as labeled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
13351	WTRMA000193	77.76	PVC	200	1985		0	0	Commercial	8	6	1	0	15
13353	WTRMA000194	1.00	PVC	200	1985		0	0	Commercial	8	6	1	0	15
13355	WTRMA000196	82.77	PVC	200	1985		0	0	Commercial	8	6	1	0	15
13357	WTRMA000197	19.95	PVC	200	1985		0	0	Commercial	8	6	1	0	15
13359	WTRMA000755	5.40	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
13367	WTRMA000748	15.63	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
13373	WTRMA000745	5.92	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
13377	WTRMA000749	8.20	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
13379	WTRMA000747	35.07	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
13383	WTRMA000523	6.00	PVC	250	2000		0	0	Industrial	7	2	1	0	10
13385	WTRMA000522	6.00	PVC	250	2000		0	0	Industrial	7	2	1	0	10
13387	WTRMA000517	6.00	PVC	250	2000		0	0	Industrial	7	2	1	0	10
13391	WTRMA000511	6.00	PVC	250	1998		0	0	Industrial	7	2	1	0	10
13393	WTRMA000512	18.00	PVC	250	1998		0	0	Industrial	7	2	1	0	10
13395	WTRMA000516	62.00	PVC	250	2000		0	0	Industrial	7	2	1	0	10
13399	WTRMA000510	139.74	PVC	250	1998		0	0	Industrial	7	2	1	0	10
13401	WTRMA000508	154.84	PVC	250	1998		0	0	Industrial	7	2	1	0	10
13405	WTRMA000414	94.37	AC	300	1975		0	0	Industrial	7	8	3	0	18
13409	WTRMA000417	12.32	AC	300	1975		0	0	Industrial	7	8	3	0	18
13411	WTRMA000419	146.78	AC	300	1975		1	6	Industrial	7	8	3	0	24
13415	WTRMA000421	7.06	AC	300	1975		0	0	Industrial	7	8	3	0	18
13419	WTRMA000423	123.02	AC	300	1975		0	0	Industrial	7	8	3	0	18
13421	WTRMA000426	7.01	AC	200	1975		0	0	Industrial	7	8	3	5	23
13423	WTRMA000425	1.00	AC	300	1975		0	0	Industrial	7	8	3	0	18
13425	WTRMA000432	124.92	AC	300	1975		0	0	Industrial	7	8	3	0	18
13427	WTRMA000187	77.88	PVC	200	1985		0	0	Commercial	8	6	1	0	15
13429	WTRMA000184	6.35	PVC	200	1985		0	0	Commercial	8	6	1	0	15
13431	WTRMA000185	6.15	PVC	200	1985		0	0	Commercial	8	6	1	10	25
13433	WTRMA000181	13.45	PVC	200	1985		0	0	Commercial	8	6	1	0	15
13435	WTRMA000178	4.64	PVC	200	1985		0	0	Commercial	8	6	1	0	15
13437	WTRMA000175	3.56	PVC	200	1984		0	0	SF - Residential	1	6	1	0	8
13443	WTRMA000174	1.94	AC	250	1975		0	0	Industrial	7	8	3	0	18
13445	WTRMA000166	131.49	CI	200	1960	1984	0	0	N/A	0	0	0	0	0
13447	WTRMA000164	7.04	AC	150	1984		0	0	Commercial	8	6	3	0	17
13449	WTRMA000167	71.74	AC	300	1984		0	0	Commercial	8	6	3	0	17
13451	WTRMA000165	14.35	AC	300	1984		0	0	Commercial	8	6	3	0	17
13457	WTRMA000743	9.12	PVC	250	1986		0	0	Institutional	10	4	1	0	15
13467	WTRMA000731	8.48	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
13469	WTRMA000736	8.32	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
13473	WTRMA000738	8.82	PVC	200	1986		0	0	Institutional	10	4	1	0	15
13475	WTRMA000730	39.78	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
13477	WTRMA000507	4.56	PVC	250	1998		0	0	Industrial	7	2	1	0	10
13479	WTRMA002272	38.00	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
13485	WTRMA002276	5.37	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
13489	WTRMA002267	1.92	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
13491	WTRMA002278	5.42	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
13493	WTRMA002279	4.69	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
13501	WTRMA000424	6.40	AC	300	1975		0	0	Industrial	7	8	3	0	18
13503	WTRMA000394	1.43	AC	300	1975		0	0	Industrial	7	8	3	0	18
13505	WTRMA000396	9.46	AC	300	1975		0	0	Industrial	7	8	3	0	18
13509	WTRMA000330	1.06	AC	200	1975		0	0	Industrial	7	8	3	0	18
13511	WTRMA000329	1.06	AC	250	1975		0	0	Industrial	7	8	3	0	18
13513	WTRMA000393	155.68	AC	300	1975		0	0	Industrial	7	8	3	0	18
13515	WTRMA000389	128.44	AC	300	1975		0	0	Industrial	7	8	3	0	18
13519	WTRMA000390	14.39	AC	300	1975		0	0	Industrial	7	8	3	0	18
13521	WTRMA000392	15.58	AC	300	1975		0	0	Industrial	7	8	3	5	23
13525	WTRMA000163	5.95	AC	300	1984		0	0	Commercial	8	6	3	0	17
13527	WTRMA000168	43.61	AC	300	1984		0	0	Industrial	7	6	3	0	16
13529	WTRMA000171	2.50	AC	250	1984		0	0	Industrial	7	6	3	0	16
13531	WTRMA000172	1.28	AC	250	1984		0	0	Industrial	7	6	3	0	16
13533	WTRMA000173	0.92	AC	250	1975		0	0	Industrial	7	6	3	0	18
13535	WTRMA000170	24.73	CI	200	1960		0	0	Industrial	7	10	10	0	27
13537	WTRMA000161	88.10	AC	300	1984		0	0	Commercial	8	6	3	0	17
13539	WTRMA000169	27.39	AC	300	1984		0	0	Industrial	7	6	3	0	16
13541	WTRMA000160	1.30	AC	200	1984		0	0	Commercial	8	6	3	0	17
13543	WTRMA000162	67.37	CI	200	1960		0	0	N/A	0	0	0	0	0
13549	WTRMA000157	89.17	PVC	400	1984	1984	0	0	Commercial	13	6	1	0	20
13551	WTRMA000729	35.22	PVC	200	1986		0	0	SF - Residential	1	4	1	10	16
13553	WTRMA000208	1.76	PVC	300	1999		0	0	Commercial	8	2	1	0	11
13565	WTRMA003150	5.30	AC	300	1970		0	0	Commercial	8	8	3	0	19
13567	WTRMA003149	2.44	AC	300	1970		0	0	Commercial	8	8	3	0	19
13569	WTRMA003143	12.95	AC	350	1970		0	0	Commercial	13	8	3	0	24
13571	WTRMA003144	27.81	AC	350	1970		0	0	Commercial	13	8	3	0	24
13575	WTRMA002266	5.67	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
13577	WTRMA000559	27.72	AC	300	1982		0	0	Industrial	7	6	3	10	26
13579	WTRMA000563	14.22	AC	300	1982		0	0	Industrial	7	6	3	0	16
13581	WTRMA000561	18.00	PVC	300	1982		0	0	Industrial	7	6	1	0	14
13583	WTRMA000562	11.00	AC	300	1982		0	0	Industrial	7	6	3	0	16
13585	WTRMA000560	11.00	AC	300	1982		0	0	Industrial	7	6	3	10	26
13587	WTRMA000554	14.89	AC	300	1982		0	0	Industrial	7	6	3	0	16
13589	WTRMA000553	73.01	AC	300	1982		0	0	Industrial	7	6	3	0	16
13595	WTRMA000550	121.39	AC	300	1982		0	0	Industrial	7	6	3	0	16
13597	WTRMA000545	10.27	AC	300	1980		0	0	Industrial	7	6	3	0	16
13599	WTRMA000384	6.89	AC	300	1975		0	0	Commercial	8	8	3	0	19
13601	WTRMA000383	0.75	AC	300	1975		0	0	Commercial	8	8	3	0	19
13605	WTRMA000368	25.91	STL	400	1975		0	0	Commercial	13	8	1	0	22
13607	WTRMA000375	1.00	AC	400	1975		0	0	Commercial	13	8	3	0	24
13609	WTRMA000374	0.61	AC	150	1975		0	0	Commercial	8	8	3	0	19
13611	WTRMA000373	0.61	AC	200	1975		0	0	Commercial	8	8	3	0	19
13613	WTRMA000372	5.11	AC	400	1975		0	0	Commercial	13	8	3	0	24
13615	WTRMA000370	0.99	AC	300	1975		0	0	Commercial	8	8	3	0	19
13617	WTRMA000371	0.99	AC	300	1975		0	0	Commercial	8	8	3	0	19
13619	WTRMA000376	3.96	AC	200	1975		0	0	Commercial	8	8	3	0	19
13621	WTRMA000367	30.99	AC	400	1975		1	6	Commercial	13	8	3	0	30
13623	WTRMA000156	6.40	PVC	400	1984		0	0	Commercial	13	6	1	0	20
13625	WTRMA000150	1.15	AC	200	1982		0	0	Industrial	7	6	3	0	16
13629	WTRMA000107	12.94	AC	400	1982		0	0	Industrial	12	6	3	0	21
13631	WTRMA000108	1.34	AC	400	1982		0	0	Industrial	12	6	3	0	21

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
13633	WTRMA000109	10.43	AC	300	1982		0	0	Industrial	7	6	3	0	16
13635	WTRMA000110	2.99	AC	300	1982		0	0	Industrial	7	6	3	0	16
13637	WTRMA000085	1.00	AC	200	1982		0	0	SF - Residential	1	6	3	0	10
13641	WTRMA000083	97.81	CI	200	1960	1985	0	0	N/A	0	0	0	0	0
13643	WTRMA000084	96.01	CI	200	1960	1985	0	0	N/A	0	0	0	0	0
13645	WTRMA000075	2.50	PVC	400	1985		0	0	Commercial	13	6	1	0	20
13659	WTRMA000720	6.34	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
13661	WTRMA000718	77.83	CI	150	1948		1	6	Commercial & SF - Residential	8	12	10	0	36
13663	WTRMA000719	5.69	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
13665	WTRMA000724	2.29	CI	150	1948		0	0	Commercial & SF - Residential	8	12	10	10	40
13681	WTRMA000549	4.00	AC	300	1980		0	0	Industrial	7	6	3	0	16
13683	WTRMA000546	7.06	AC	300	1980		0	0	Industrial	7	6	3	0	16
13687	WTRMA000543	13.05	AC	300	1980		0	0	Industrial	7	6	3	0	16
13689	WTRMA000542	70.74	AC	300	1980		0	0	Industrial	7	6	3	0	16
13691	WTRMA000537	122.10	AC	300	1980		0	0	Industrial	7	6	3	0	16
13695	WTRMA000539	5.00	AC	300	1980		0	0	Industrial	7	6	3	0	16
13697	WTRMA000364	1.83	AC	300	1975		0	0	Commercial	8	8	3	0	19
13699	WTRMA000365	1.83	AC	300	1975		0	0	Commercial	8	8	3	0	19
13701	WTRMA000357	5.18	AC	400	1975		0	0	Industrial	12	8	3	0	23
13703	WTRMA000355	1.96	AC	300	1975		0	0	Industrial	7	8	3	0	18
13705	WTRMA000356	1.72	AC	300	1975		0	0	Industrial	7	8	3	0	18
13707	WTRMA000363	11.23	AC	400	1975		0	0	Commercial	13	8	3	0	24
13709	WTRMA000358	1.28	AC	300	1975		0	0	Industrial	7	8	3	0	18
13711	WTRMA000362	0.31	AC	200	1975		0	0	Industrial	7	8	3	0	18
13713	WTRMA000361	0.30	AC	200	1975		0	0	Industrial	7	8	3	0	18
13715	WTRMA000360	1.82	AC	200	1975		0	0	Industrial	7	8	3	0	18
13717	WTRMA000353	28.96	STL	400	1975		0	0	Industrial	12	8	1	0	21
13719	WTRMA000354	16.24	AC	400	1975		0	0	Industrial	12	8	3	0	23
13723	WTRMA000077	1.50	PVC	300	1985		0	0	Commercial	8	6	1	0	15
13725	WTRMA000078	2.79	PVC	400	1985		0	0	Commercial	13	6	1	0	20
13727	WTRMA000076	1.50	PVC	300	1985		0	0	Commercial	8	6	1	0	15
13729	WTRMA000073	90.22	PVC	400	1985		0	0	Commercial	13	6	1	0	20
13731	WTRMA000072	84.98	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
13733	WTRMA000071	1.04	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
13735	WTRMA000070	1.96	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
13737	WTRMA000080	98.37	CI	200	1960	1985	0	0	N/A	0	0	0	0	0
13739	WTRMA000081	98.38	CI	200	1960	1985	0	0	N/A	0	0	0	0	0
13741	WTRMA000064	17.40	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
13743	WTRMA000066	1.50	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
13745	WTRMA000029	0.84	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
13771	WTRMA000702	49.73	CI	150	1948	1995	0	0	N/A	0	0	0	0	0
13773	WTRMA000695	1.60	CI	150	1948		0	0	Commercial	8	12	10	0	30
13775	WTRMA000540	119.52	AC	300	1980		0	0	Industrial	7	6	3	0	16
13779	WTRMA000535	85.45	AC	300	1980		0	0	Industrial	7	6	3	0	16
13781	WTRMA000413	1.83	AC	300	1975		0	0	Industrial	7	8	3	0	18
13783	WTRMA000524	116.79	AC	300	1980		0	0	Industrial	7	6	3	0	16
13785	WTRMA000528	24.78	AC	300	1980		0	0	Industrial	7	6	3	0	16
13787	WTRMA000527	90.38	AC	300	1980		0	0	Industrial	7	6	3	0	16
13789	WTRMA000531	121.29	AC	300	1980		0	0	Industrial	7	6	3	0	16
13791	WTRMA000534	16.94	AC	300	1980		0	0	Industrial	7	6	3	0	16
13797	WTRMA000382	13.42	AC	300	1975		0	0	Commercial	8	8	3	0	19
13799	WTRMA000343	0.57	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
13801	WTRMA000342	0.77	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13803	WTRMA000344	0.57	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
13805	WTRMA000341	0.76	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13807	WTRMA000347	1.22	AC	300	1975		0	0	SF - Residential	6	8	3	0	17
13809	WTRMA000345	1.83	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
13811	WTRMA000346	1.22	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13813	WTRMA000338	258.61	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
13815	WTRMA000335	12.50	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
13817	WTRMA000336	1.22	AC	300	1975		0	0	Commercial	8	8	3	0	19
13819	WTRMA000337	1.22	AC	300	1975		0	0	Commercial	8	8	3	0	19
13821	WTRMA000018	9.17	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
13823	WTRMA000017	5.79	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
13825	WTRMA000155	1.00	AC	200	1982		0	0	Industrial	7	6	3	0	16
13827	WTRMA000154	1.00	AC	200	1982		0	0	Industrial	7	6	3	0	16
13829	WTRMA000153	12.50	AC	200	1982		0	0	Industrial	7	6	3	0	16
13831	WTRMA000152	16.35	AC	200	1982		0	0	Industrial	7	6	3	0	16
13833	WTRMA000147	0.52	AC	200	1982		0	0	Industrial	7	6	3	0	16
13835	WTRMA000149	108.47	AC	200	1982		0	0	Industrial	7	6	3	0	16
13839	WTRMA000144	1.83	AC	200	1982		0	0	Industrial	7	6	3	0	16
13841	WTRMA000143	22.59	AC	200	1982		0	0	Industrial	7	6	3	0	16
13843	WTRMA000141	1.00	AC	200	1982		0	0	Industrial	7	6	3	0	16
13845	WTRMA000142	1.32	AC	200	1982		0	0	Industrial	7	6	3	0	16
13847	WTRMA000696	79.01	CI	150	1948		1	6	Commercial	8	12	10	0	36
13851	WTRMA000699	5.68	CI	150	1948		0	0	Commercial & SF - Residential	8	12	10	10	40
13853	WTRMA000694	1.60	CI	200	1948		0	0	Commercial	8	12	10	0	30
13857	WTRMA000701	17.48	CI	150	1948		0	0	Commercial & SF - Residential	8	12	10	10	40
13859	WTRMA000700	85.65	CI	150	1948		1	6	Commercial	8	12	10	0	36
13869	WTRMA000672	1.44	CI	150	1947		0	0	Commercial	8	12	10	0	30
13875	WTRMA0003081	6.60	PVC	500	1989		0	0	Institutional	15	4	1	0	20
13877	WTRMA0003082	2.39	PVC	300	1989		0	0	Institutional	10	4	1	0	15
13879	WTRMA0003083	12.06	PVC	300	1989		0	0	Institutional	10	4	1	0	15
13881	WTRMA0003073	0.75	PVC	200	1989		0	0	Parks, open space, and trails	1	4	1	0	6
13883	WTRMA0003072	0.70	PVC	200	1989		0	0	Parks, open space, and trails	1	4	1	0	6
13885	WTRMA002657	41.23	PVC	400	1989		0	0	SF - Residential	6	4	1	0	11
13887	WTRMA0003067	70.26	PVC	500	1988		0	0	Parks, open space, and trails	6	4	1	0	11
13889	WTRMA0003137	26.38	AC	350	1970		0	0	Commercial	13	8	3	0	24

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
13891	WTRMA000506	5.99	CI	150	1964	1990	0	0	N/A	0	0	0	0	0
13895	WTRMA000483	31.71	AC	300	1975		0	0	Institutional	10	8	3	0	21
13899	WTRMA000324	26.85	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
13903	WTRMA000327	22.01	PVC	150	2001		0	0	SF - Residential	1	2	1	20	24
13905	WTRMA000328	4.04	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
13907	WTRMA000322	10.64	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
13909	WTRMA000323	202.93	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
13911	WTRMA000317	2.00	PVC	300	2002		0	0	Institutional	10	2	1	0	13
13913	WTRMA000318	9.20	PVC	300	2002		0	0	Institutional	10	2	1	0	13
13915	WTRMA000319	150.18	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
13919	WTRMA000462	1.52	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13921	WTRMA000140	56.87	AC	200	1982		0	0	Commercial	8	6	3	0	17
13925	WTRMA000139	10.00	AC	200	1982		0	0	Commercial	8	6	3	0	17
13927	WTRMA000136	1.03	AC	200	1982		0	0	Commercial	7	6	3	0	16
13933	WTRMA000130	2.00	AC	200	1982		0	0	Industrial	7	6	3	0	16
13937	WTRMA000132	1.50	AC	200	1982		0	0	Industrial	7	6	3	0	16
13939	WTRMA000135	89.42	AC	200	1982		0	0	Commercial	8	6	3	0	17
13943	WTRMA000129	71.04	AC	200	1982		0	0	Commercial	8	6	3	0	17
13951	WTRMA000674	61.80	CI	150	1947		1	6	Commercial	8	12	10	0	36
13955	WTRMA000665	1.62	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
13957	WTRMA000667	64.15	CI	100	1947		2	12	Commercial	8	12	10	0	42
13959	WTRMA000666	6.27	CI	100	1947		0	0	Commercial	8	12	10	0	30
13973	WTRMA000469	3.87	AC	150	1975		0	0	Institutional	10	8	3	0	21
13975	WTRMA000459	291.83	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
13977	WTRMA000378	4.90	AC	300	1975		0	0	Commercial	8	8	3	0	19
13979	WTRMA000348	71.18	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
13981	WTRMA000332	1.00	AC	400	1975		0	0	Commercial	13	8	3	0	24
13983	WTRMA000333	1.00	AC	300	1975		0	0	Commercial	8	8	3	0	19
13985	WTRMA000334	1.00	AC	300	1975		0	0	Commercial	8	8	3	0	19
13987	WTRMA000340	10.28	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13991	WTRMA000456	1.00	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13993	WTRMA000455	1.00	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13995	WTRMA000457	0.83	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
13997	WTRMA000463	3.05	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
13999	WTRMA000321	14.13	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
14001	WTRMA000291	1.96	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14003	WTRMA000286	1.96	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14005	WTRMA000316	49.39	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14011	WTRMA000311	2.50	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14013	WTRMA000313	36.79	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14017	WTRMA000310	8.16	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14019	WTRMA000304	66.66	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14023	WTRMA000125	1.80	AC	200	1982		0	0	Industrial	7	6	3	0	16
14025	WTRMA000128	18.74	AC	200	1982		0	0	Industrial	7	6	3	0	16
14033	WTRMA000120	1.00	AC	200	1982		0	0	Industrial	7	6	3	0	16
14035	WTRMA000119	3.93	AC	200	1982		0	0	Industrial	7	6	3	5	21
14037	WTRMA000122	8.08	AC	200	1982		0	0	Industrial	7	6	3	5	21
14039	WTRMA000116	2.10	AC	200	1982		0	0	Industrial	7	6	3	0	16
14041	WTRMA000118	97.29	AC	200	1982		0	0	Industrial	7	6	3	0	16
14045	WTRMA000640	8.54	CI	150	1947		0	0	Institutional and commercial	10	12	10	0	32
14055	WTRMA000639	5.13	CI	150	1947		0	0	Commercial	8	12	10	0	30
14057	WTRMA000638	114.99	CI	150	1947		0	0	Commercial	8	12	10	0	30
14061	WTRMA000616	6.56	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
14065	WTRMA000617	12.03	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
14067	WTRMA000618	80.27	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
14069	WTRMA000620	6.68	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
14071	WTRMA000485	1.18	AC	250	1975		0	0	SF - Residential	1	8	3	0	12
14073	WTRMA000412	0.75	AC	300	1975		0	0	Industrial	7	8	3	0	18
14077	WTRMA000409	1.00	AC	200	1975		0	0	Industrial	7	8	3	0	18
14079	WTRMA000410	11.96	AC	300	1975		0	0	Industrial	7	8	3	0	18
14081	WTRMA000407	30.48	AC	300	1975		0	0	Industrial	7	8	3	0	18
14083	WTRMA000406	14.93	STL	300	1975		0	0	Industrial	7	8	1	0	16
14085	WTRMA000402	114.98	AC	300	1975		0	0	Industrial	7	8	3	0	18
14087	WTRMA000401	14.94	STL	300	1975		0	0	Industrial	7	8	1	0	16
14089	WTRMA000400	6.10	AC	300	1975		0	0	Industrial	7	8	3	0	18
14091	WTRMA000399	14.63	STL	300	1975		0	0	Industrial	7	8	1	0	16
14093	WTRMA000398	8.23	AC	300	1975		0	0	Industrial	7	8	3	0	18
14095	WTRMA000307	12.32	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14099	WTRMA000309	63.56	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14101	WTRMA000308	3.32	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14103	WTRMA000295	13.95	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14107	WTRMA000296	134.14	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14109	WTRMA000301	3.19	PVC	150	1993		0	0	SF - Residential	1	4	1	0	6
14113	WTRMA000300	10.43	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14115	WTRMA000299	1.11	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
14119	WTRMA000302	1.91	PVC	150	1993		0	0	SF - Residential	1	4	1	0	6
14121	WTRMA000112	1.45	AC	200	1982		0	0	Industrial	7	6	3	0	16
14123	WTRMA000115	97.27	AC	200	1982		0	0	Industrial	7	6	3	0	16
14129	WTRMA000098	82.81	AC	250	1982		0	0	Industrial	7	6	3	0	16
14131	WTRMA000096	90.28	AC	250	1982		1	6	Industrial	7	6	3	0	22
14133	WTRMA000099	48.91	AC	250	1982		0	0	Industrial	7	6	3	0	16
14135	WTRMA000101	64.89	AC	250	1982		0	0	Industrial	7	6	3	0	16
14137	WTRMA000102	1.10	AC	250	1982		0	0	Industrial	7	6	3	0	16
14139	WTRMA000104	109.85	AC	250	1982		0	0	Industrial	7	6	3	0	16
14143	WTRMA000093	92.57	AC	250	1982		0	0	Industrial	7	6	3	0	16
14147	WTRMA000614	79.96	TRAN	150	1940		2	12	Commercial	8	14	1	0	35
14151	WTRMA000612	6.66	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
14157	WTRMA000594	6.59	TRAN	150	1940		0	0	Commercial	8	14	1	10	33
14161	WTRMA000596	82.17	TRAN	150	1940		1	6	Commercial	8	14	1	0	29
14163	WTRMA000591	78.30	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
14167	WTRMA000590	13.71	TRAN	150	1940		0	0	Commercial	8	14	1	10	33
14169	WTRMA000589	7.40	TRAN	150	1940		0	0	Commercial	8	14	1	10	33
14171	WTRMA001029	14.00	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14173	WTRMA001030	7.47	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14175	WTRMA001033	53.63	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14177	WTRMA001024	18.81	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14179	WTRMA001035	46.00	AC	150	1980		0	0	SF - Residential	1	6	3	0	10

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
14181	WTRMA001034	13.98	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
14197	WTRMA000836	11.29	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
14199	WTRMA000827	2.93	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
14205	WTRMA000826	9.05	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
14207	WTRMA000823	8.93	PVC	250	1996		0	0	SF - Residential	1	2	1	0	4
14209	WTRMA000822	54.36	PVC	250	1996		0	0	SF - Residential	1	2	1	0	4
14215	WTRMA000824	51.31	PVC	250	1996		0	0	SF - Residential	1	2	1	0	4
14217	WTRMA001394	3.15	PVC	250	2004		0	0	Industrial	7	2	1	0	10
14221	WTRMA001395	9.87	PVC	250	2004		0	0	Industrial	7	2	1	0	10
14225	WTRMA001386	15.46	PVC	250	2004		0	0	Industrial	7	2	1	0	10
14231	WTRMA001381	4.93	PVC	400	2004		0	0	Industrial	12	2	1	0	15
14235	WTRMA001384	1.80	PVC	400	2004		0	0	Industrial	12	2	1	0	15
14237	WTRMA001376	8.30	PVC	400	2004		0	0	Industrial	12	2	1	0	15
14239	WTRMA001209	3.33	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
14245	WTRMA001215	1.55	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
14247	WTRMA001216	12.00	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
14251	WTRMA001205	7.00	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
14259	WTRMA001200	1.64	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
14275	WTRMA001028	3.00	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
14285	WTRMA001023	13.50	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
14303	WTRMA000813	2.27	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
14323	WTRMA001372	56.23	PVC	250	2000		0	0	Industrial	7	2	1	0	10
14325	WTRMA001371	10.58	PVC	250	2000		0	0	Industrial	7	2	1	0	10
14331	WTRMA001197	0.85	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
14337	WTRMA001193	6.00	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
14341	WTRMA001199	7.00	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
14347	WTRMA001187	6.50	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
14351	WTRMA001188	5.67	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
14357	WTRMA001016	6.04	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
14361	WTRMA001017	13.49	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
14363	WTRMA001027	5.97	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
14371	WTRMA001039	1.00	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14375	WTRMA001040	1.00	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14379	WTRMA000814	11.51	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
14381	WTRMA000816	6.98	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
14385	WTRMA000803	28.81	PVC	250	1995		0	0	SF - Residential	1	4	1	0	6
14387	WTRMA000807	6.05	PVC	250	1995		0	0	SF - Residential	1	4	1	0	6
14389	WTRMA000806	17.89	PVC	250	1995		0	0	SF - Residential	1	4	1	0	6
14391	WTRMA000809	8.79	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
14393	WTRMA000808	38.26	PVC	250	1995		0	0	SF - Residential	1	4	1	0	6
14403	WTRMA001370	49.77	PVC	400	2000		0	0	Industrial	12	2	1	0	15
14411	WTRMA001363	89.45	PVC	250	1997		0	0	Industrial	7	2	1	0	10
14419	WTRMA001359	26.00	PVC	400	1999		0	0	Industrial	12	2	1	0	15
14423	WTRMA001364	15.30	PVC	250	1997		0	0	Industrial	7	2	1	5	15
14435	WTRMA001175	14.43	AC	150	1981		0	0	Institutional & SF - residential	10	6	3	0	19
14441	WTRMA001169	14.29	AC	200	1981		0	0	Institutional	10	6	3	0	19
14445	WTRMA001168	14.52	AC	200	1981		0	0	Institutional & SF - residential	10	6	3	0	19
14447	WTRMA001167	123.31	AC	200	1980		0	0	Institutional	10	6	3	0	19
14449	WTRMA001043	13.50	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14451	WTRMA001064	13.48	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14465	WTRMA001018	6.50	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
14469	WTRMA001038	2.97	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
14471	WTRMA000964	6.40	PVC	150	1998		0	0	SF - Residential	1	2	1	0	4
14473	WTRMA000965	38.32	PVC	150	1998		0	0	SF - Residential	1	2	1	0	4
14477	WTRMA000798	8.48	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
14481	WTRMA000799	11.97	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
14487	WTRMA000784	53.92	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
14489	WTRMA000787	8.61	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
14491	WTRMA000788	12.15	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
14493	WTRMA000793	12.09	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
14497	WTRMA001357	9.31	PVC	400	1997		0	0	Industrial	12	2	1	0	15
14499	WTRMA001353	19.92	PVC	400	1997		0	0	Industrial	12	2	1	0	15
14503	WTRMA001356	15.82	PVC	400	1997		0	0	Industrial	12	2	1	5	20
14507	WTRMA001349	0.86	PVC	400	1997		0	0	Industrial	12	2	1	0	15
14521	WTRMA001166	8.49	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14525	WTRMA001162	78.31	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14529	WTRMA001165	5.90	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14533	WTRMA001180	8.61	PVC	150	1985		0	0	SF - Residential	1	6	3	0	8
14535	WTRMA001161	61.74	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14543	WTRMA001065	19.37	AC	200	1980		0	0	SF - Residential	1	6	3	5	15
14545	WTRMA001066	98.23	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14547	WTRMA000946	47.69	AC	200	1968		0	0	SF - Residential	1	8	3	5	17
14549	WTRMA000949	13.51	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
14557	WTRMA000940	85.46	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
14561	WTRMA000945	63.63	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
14563	WTRMA000939	79.24	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
14565	WTRMA000938	14.17	AC	200	1968		0	0	SF - Residential	1	8	3	5	17
14569	WTRMA000790	12.11	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
14591	WTRMA001366	27.53	PVC	400	1997		0	0	Industrial	12	2	1	0	15
14595	WTRMA001341	2.12	PVC	400	1997		0	0	Industrial	12	2	1	0	15
14603	WTRMA001332	8.03	PVC	400	1989		0	0	Industrial	12	4	1	0	17
14605	WTRMA001331	2.00	PVC	300	1989		0	0	Industrial	7	4	1	0	12
14613	WTRMA001160	7.72	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14615	WTRMA001159	40.46	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
14617	WTRMA001177	8.50	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
14621	WTRMA001173	15.45	AC	150	1981		0	0	SF - Residential	1	6	3	0	10
14623	WTRMA001172	24.39	AC	200	1981		0	0	Institutional	10	6	3	0	19
14625	WTRMA001136	6.40	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14627	WTRMA001128	118.84	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14629	WTRMA001129	4.15	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14631	WTRMA001131	13.76	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14633	WTRMA001132	5.39	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14637	WTRMA000944	13.71	AC	200	1968		0	0	SF - Residential	1	8	3	5	17
14639	WTRMA000954	2.00	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
14643	WTRMA000951	106.35	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
14647	WTRMA000950	6.40	AC	150	1968		0	0	Institutional	10	8	3	0	21

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
14649	WTRMA000955	6.40	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
14651	WTRMA000962	6.11	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
14655	WTRMA000959	36.78	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
14659	WTRMA000957	6.40	AC	150	1968		0	0	SF - Residential	1	8	3	5	17
14663	WTRMA001518	5.56	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
14665	WTRMA001513	1.35	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
14667	WTRMA001521	12.33	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
14669	WTRMA001507	5.07	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
14671	WTRMA001508	16.91	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
14673	WTRMA001498	21.17	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
14683	WTRMA001329	5.60	PVC	300	1989		0	0	Industrial	7	4	1	0	12
14687	WTRMA001340	1.43	PVC	150	1990		0	0	Industrial	7	4	1	0	12
14691	WTRMA001326	99.11	PVC	300	1989		0	0	Industrial	7	4	1	0	12
14693	WTRMA001328	2.94	PVC	300	1989		0	0	Industrial	7	4	1	0	12
14695	WTRMA001330	26.65	PVC	300	1989		0	0	Industrial	7	4	1	10	22
14697	WTRMA001307	330.50	PVC	250	1989		0	0	Industrial	7	4	1	0	12
14699	WTRMA001308	25.50	PVC	250	1989		0	0	Industrial	7	4	1	0	12
14701	WTRMA001306	536.37	PVC	250	1989		0	0	Industrial	7	4	1	0	12
14703	WTRMA001301	450.19	PVC	300	1989		0	0	SF - Residential	1	4	1	0	6
14707	WTRMA001158	124.48	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14709	WTRMA001151	14.12	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14713	WTRMA001155	147.94	AC	200	1976		0	0	SF - Residential	1	6	3	5	15
14717	WTRMA001157	6.40	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14719	WTRMA001156	62.06	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14721	WTRMA001135	31.17	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14723	WTRMA001152	12.11	AC	200	1976		0	0	SF - Residential	1	6	3	5	15
14725	WTRMA001150	52.90	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14727	WTRMA001145	6.42	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14729	WTRMA000943	7.77	AC	200	1968		0	0	SF - Residential	1	8	3	5	17
14731	WTRMA000963	50.32	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
14733	WTRMA000958	209.28	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
14735	WTRMA000956	209.27	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
14737	WTRMA000934	2.95	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
14743	WTRMA000933	15.01	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
14745	WTRMA000929	2.93	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
14751	WTRMA001503	2.65	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
14761	WTRMA001490	10.94	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
14765	WTRMA001491	15.10	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
14767	WTRMA001494	6.14	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
14769	WTRMA001495	12.05	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
14773	WTRMA001316	12.00	PVC	250	1989		0	0	Industrial	7	4	1	0	12
14775	WTRMA001310	2.50	PVC	250	1989		0	0	Industrial	7	4	1	0	12
14777	WTRMA001309	2.50	PVC	250	1989		0	0	Industrial	7	4	1	0	12
14779	WTRMA001315	747.50	PVC	250	1989		0	0	Industrial	7	4	1	0	12
14781	WTRMA001311	1.10	PVC	150	1989		0	0	Industrial	7	4	1	0	12
14783	WTRMA001314	1.10	PVC	150	1989		0	0	Industrial	7	4	1	0	12
14785	WTRMA001312	1.10	PVC	150	1989		0	0	Industrial	7	4	1	0	12
14787	WTRMA001324	2.14	PVC	300	1989		0	0	Industrial	7	4	1	0	12
14789	WTRMA001323	156.12	PVC	300	1989		0	0	Industrial	7	4	1	0	12
14791	WTRMA001322	327.50	PVC	300	1989		0	0	Industrial	7	4	1	0	12
14793	WTRMA001318	1.50	PVC	300	1989		0	0	Industrial	7	4	1	0	12
14797	WTRMA001148	208.83	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14799	WTRMA001149	11.87	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14801	WTRMA001142	208.42	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
14803	WTRMA001143	13.69	AC	150	1976		0	0	SF - Residential	1	6	3	5	15
14805	WTRMA001130	62.88	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14807	WTRMA001144	87.78	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14809	WTRMA001121	36.78	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14811	WTRMA001124	8.53	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14817	WTRMA001125	79.70	AC	200	1976		0	0	SF - Residential	1	6	3	5	15
14819	WTRMA001141	6.40	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
14821	WTRMA001127	58.18	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14823	WTRMA000928	15.07	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
14825	WTRMA000924	6.02	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
14831	WTRMA000926	6.02	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
14841	WTRMA000921	16.67	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
14843	WTRMA001489	37.21	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
14847	WTRMA001486	6.13	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
14851	WTRMA001485	14.99	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
14855	WTRMA001484	69.27	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
14859	WTRMA001481	26.47	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
14865	WTRMA001321	71.80	PVC	300	1989		0	0	Industrial	7	4	1	0	12
14869	WTRMA001317	2.00	PVC	200	1989		0	0	Industrial	7	4	1	0	12
14871	WTRMA001305	27.49	PVC	250	1989		0	0	Industrial	7	4	1	0	12
14873	WTRMA001325	7.71	PVC	300	1989		0	0	Industrial	7	4	1	0	12
14875	WTRMA001304	522.46	PVC	250	1989		0	0	Industrial	7	4	1	0	12
14877	WTRMA001303	18.68	PVC	250	1989		0	0	Industrial	7	4	1	0	12
14879	WTRMA001302	258.80	PVC	300	1989		0	0	Industrial	7	4	1	0	12
14881	WTRMA001292	2.00	PVC	300	1985		0	0	Institutional	10	6	1	0	17
14887	WTRMA001286	2.00	PVC	300	1985		0	0	Institutional	10	6	1	0	17
14891	WTRMA001137	5.53	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14895	WTRMA001140	31.10	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14897	WTRMA001126	13.71	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14899	WTRMA001120	9.94	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14901	WTRMA001119	13.69	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
14905	WTRMA001118	2.94	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
14909	WTRMA001114	15.37	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
14913	WTRMA001112	86.87	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
14919	WTRMA000916	6.23	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
14923	WTRMA000915	11.88	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
14935	WTRMA000910	42.11	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
14943	WTRMA001473	3.57	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
14951	WTRMA001471	2.67	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
14955	WTRMA001467	12.75	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
14959	WTRMA001300	15.00	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
14961	WTRMA001298	26.33	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
14963	WTRMA001299	15.63	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
14965	WTRMA001287	2.00	PVC	300	1985		0	0	Institutional	10	6	1	0	17

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
14967	WTRMA001293	2.00	PVC	300	1985		0	0	Institutional	10	6	1	0	17
14971	WTRMA001297	7.87	PVC	400	1985		0	0	SF - Residential	6	6	1	5	18
14985	WTRMA001109	6.64	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
14987	WTRMA001108	3.57	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
14989	WTRMA001107	2.00	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14991	WTRMA001115	125.42	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
14993	WTRMA001147	6.40	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14995	WTRMA001146	155.90	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
14999	WTRMA001105	21.20	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
15003	WTRMA001102	95.02	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
15005	WTRMA001100	12.86	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
15011	WTRMA000905	21.71	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
15021	WTRMA000908	47.17	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
15023	WTRMA000904	6.67	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
15025	WTRMA000909	6.10	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
15029	WTRMA000899	48.09	PVC	250	1999		0	0	SF - Residential	1	2	1	0	4
15031	WTRMA001468	10.76	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
15037	WTRMA001458	11.68	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
15045	WTRMA001457	13.95	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
15047	WTRMA001492	14.94	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
15059	WTRMA001271	11.99	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
15061	WTRMA001280	15.60	PVC	200	2005	2007	0	0	N/A	0	0	0	0	0
15063	WTRMA001281	6.50	PVC	200	2005	2007	0	0	N/A	0	0	0	0	0
15067	WTRMA001272	70.00	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
15073	WTRMA001099	8.68	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
15077	WTRMA001113	59.60	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
15079	WTRMA001095	13.42	AC	150	1976		0	0	SF - Residential	1	6	3	5	15
15081	WTRMA001094	6.03	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
15087	WTRMA001091	73.77	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
15089	WTRMA001101	6.41	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
15091	WTRMA001087	6.35	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
15095	WTRMA001090	80.31	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
15099	WTRMA000895	15.47	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
15101	WTRMA000897	15.22	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
15103	WTRMA000894	6.02	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
15111	WTRMA000893	32.00	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
15127	WTRMA001444	11.24	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
15131	WTRMA001448	5.54	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
15139	WTRMA001461	13.53	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
15143	WTRMA001278	5.95	PVC	200	2005		0	0	Multifamily	5	2	1	0	8
15163	WTRMA001096	64.60	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
15165	WTRMA001106	40.00	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
15167	WTRMA001086	6.57	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
15169	WTRMA001083	61.22	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15173	WTRMA001037	14.43	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15175	WTRMA000974	6.51	PVC	150	1985		0	0	SF - Residential	1	6	3	0	10
15185	WTRMA000975	5.78	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
15187	WTRMA000896	36.05	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
15191	WTRMA000883	7.38	PVC	250	1999		0	0	SF - Residential	1	2	1	0	4
15193	WTRMA000884	38.83	PVC	250	1999		0	0	SF - Residential	1	2	1	0	4
15195	WTRMA000885	8.51	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
15197	WTRMA000882	36.13	PVC	250	1998		0	0	SF - Residential	1	2	1	0	4
15199	WTRMA000881	5.76	PVC	250	1998		0	0	SF - Residential	1	2	1	0	4
15201	WTRMA000880	43.18	PVC	250	1998		0	0	SF - Residential	1	2	1	0	4
15209	WTRMA001452	14.39	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
15211	WTRMA001462	21.44	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
15213	WTRMA001464	10.14	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
15217	WTRMA001440	78.59	PVC	400	2005		0	0	Industrial	12	2	1	0	15
15227	WTRMA001436	3.42	PVC	400	2004		0	0	Industrial	12	2	1	0	15
15229	WTRMA001439	18.16	PVC	400	2004		0	0	Industrial	12	2	1	0	15
15239	WTRMA001256	6.18	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
15241	WTRMA001257	5.90	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
15261	WTRMA000988	6.50	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
15271	WTRMA001070	15.83	AC	150	1980		0	0	SF - Residential	1	6	3	5	15
15277	WTRMA000878	10.97	PVC	150	2000		0	0	SF - Residential	1	2	1	0	4
15281	WTRMA000877	1.26	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
15283	WTRMA000871	48.60	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
15285	WTRMA000870	6.04	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
15287	WTRMA000876	5.83	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
15289	WTRMA000869	77.89	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
15291	WTRMA000858	67.49	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
15301	WTRMA001424	3.05	PVC	400	2004		0	0	Industrial	12	2	1	0	15
15317	WTRMA001420	3.10	PVC	400	2004		0	0	Industrial	12	2	1	0	15
15319	WTRMA001245	7.06	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
15321	WTRMA001270	34.72	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
15323	WTRMA001269	6.09	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
15345	WTRMA000992	34.98	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
15349	WTRMA000991	13.48	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
15359	WTRMA001001	13.51	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
15363	WTRMA000859	8.95	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
15367	WTRMA000866	43.80	PVC	200	1997		0	0	Institutional	10	2	1	0	13
15371	WTRMA000861	82.98	PVC	200	1997		0	0	Institutional	10	2	1	0	13
15373	WTRMA000867	6.10	PVC	200	1997		0	0	Institutional	10	2	1	0	13
15375	WTRMA000862	11.96	PVC	200	1997		0	0	Institutional	10	2	1	0	13
15377	WTRMA000863	2.14	PVC	200	1997		0	0	Institutional	10	2	1	0	13
15379	WTRMA000868	31.82	PVC	200	1997		0	0	Institutional	10	2	1	0	13
15383	WTRMA000850	113.06	PVC	250	1997		0	0	SF - Residential	1	2	1	0	4
15405	WTRMA001412	1.68	PVC	400	2004		0	0	Industrial	12	2	1	0	15
15409	WTRMA001276	10.98	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
15419	WTRMA001232	15.73	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
15421	WTRMA001235	0.44	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
15425	WTRMA001233	7.98	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
15433	WTRMA000999	6.50	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
15443	WTRMA000971	4.78	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
15445	WTRMA000970	2.00	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
15453	WTRMA000847	1.99	PVC	250	1997		0	0	SF - Residential	1	2	1	0	4
15457	WTRMA000852	2.50	PVC	250	1997		0	0	SF - Residential	1	2	1	0	4
15461	WTRMA000851	8.78	PVC	250	1997		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
15463	WTRMA000846	6.22	PVC	250	1997		0	0	SF - Residential	1	2	1	0	4
15465	WTRMA000860	15.08	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
15467	WTRMA000845	39.18	PVC	250	1997		0	0	SF - Residential	1	2	1	0	4
15471	WTRMA000837	100.33	PVC	250	1997		0	0	SF - Residential	1	2	1	0	4
15477	WTRMA001408	3.04	PVC	400	2005		0	0	Industrial	5	2	1	0	8
15481	WTRMA001396	3.00	PVC	400	2005		0	0	Industrial	5	2	1	0	8
15491	WTRMA001404	2.93	PVC	400	2005		0	0	Industrial	7	2	1	0	10
15493	WTRMA001441	88.54	PVC	400	2005		0	0	Industrial	5	2	1	0	8
15495	WTRMA001231	47.12	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
15497	WTRMA001238	8.42	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
15505	WTRMA001218	2.05	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
15507	WTRMA001219	70.86	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
15517	WTRMA001060	5.95	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15521	WTRMA001063	84.75	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15523	WTRMA001059	7.79	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15527	WTRMA001069	67.03	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15531	WTRMA001072	55.25	AC	200	1980		0	0	SF - Residential	1	6	3	5	15
15533	WTRMA001073	13.40	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15535	WTRMA001071	34.99	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15541	WTRMA000841	11.15	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
15543	WTRMA000840	2.68	PVC	250	1997		0	0	SF - Residential	1	2	1	0	4
15545	WTRMA000842	6.04	PVC	250	1997		0	0	SF - Residential	1	2	1	0	4
15547	WTRMA000843	132.52	PVC	250	1997		0	0	SF - Residential	1	2	1	0	4
15549	WTRMA000855	38.67	PVC	250	1997		0	0	SF - Residential	1	2	1	0	4
15551	WTRMA000844	12.29	PVC	250	1997		0	0	SF - Residential	1	2	1	0	4
15553	WTRMA000834	80.77	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
15555	WTRMA000835	9.11	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
15559	WTRMA000831	95.51	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
15561	WTRMA001400	9.43	PVC	400	2005		0	0	Industrial	5	2	1	0	8
15569	WTRMA001411	27.88	PVC	400	2004		0	0	Industrial	5	2	1	0	8
15571	WTRMA001410	8.44	PVC	250	2005		0	0	Industrial	7	2	1	0	10
15583	WTRMA001224	36.57	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
15585	WTRMA001225	6.24	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
15589	WTRMA001227	12.33	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
15595	WTRMA001230	1.62	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
15605	WTRMA001080	122.81	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15611	WTRMA001075	6.34	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15615	WTRMA001078	8.57	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15617	WTRMA001074	81.67	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15621	WTRMA001079	90.36	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15623	WTRMA001085	15.46	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15625	WTRMA001025	47.84	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15627	WTRMA001026	6.49	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
15629	WTRMA003851	57.64	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
15643	WTRMA003636	108.26	PVC	400	2004		0	0	Commercial	13	2	1	0	16
15645	WTRMA003639	35.66	PVC	400	2004		0	0	Commercial	13	2	1	0	16
15647	WTRMA003640	103.75	PVC	400	2004		0	0	Commercial	13	2	1	0	16
15649	WTRMA003633	1.88	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
15653	WTRMA003441	6.35	AC	200	1977		0	0	Industrial	7	6	3	10	26
15655	WTRMA003440	19.11	AC	200	1977		0	0	Industrial	7	6	3	10	26
15657	WTRMA003437	176.63	AC	200	1977		1	6	Industrial	7	6	3	0	22
15659	WTRMA003436	4.50	AC	200	1977		0	0	Industrial	7	6	3	0	16
15661	WTRMA003429	8.58	AC	150	1967		0	0	Commercial	8	8	3	0	19
15665	WTRMA003387	15.30	AC	150	1967		0	0	Commercial	8	8	3	0	19
15667	WTRMA003385	86.74	AC	150	1967		0	0	Commercial	8	8	3	0	19
15669	WTRMA003433	11.15	AC	150	1967		0	0	Commercial	8	8	3	0	19
15677	WTRMA002476	13.98	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
15679	WTRMA002475	103.79	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
15681	WTRMA002473	1.52	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
15683	WTRMA002470	75.53	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
15685	WTRMA002472	15.50	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
15687	WTRMA002469	7.45	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
15691	WTRMA002466	1.52	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15695	WTRMA002464	13.87	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15699	WTRMA002463	6.15	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15701	WTRMA002268	6.75	AC	150	1994		0	0	SF - Residential	1	4	3	0	8
15713	WTRMA002256	6.33	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
15731	WTRMA003630	5.73	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
15735	WTRMA003629	11.42	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
15741	WTRMA003619	14.81	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
15743	WTRMA003622	16.99	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
15745	WTRMA003621	15.11	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
15751	WTRMA003432	36.14	AC	150	1967		0	0	Commercial	8	8	3	0	19
15753	WTRMA003428	71.84	AC	150	1967		0	0	Commercial	8	8	3	0	19
15763	WTRMA003414	149.03	AC	150	1967		0	0	Commercial	8	8	3	0	19
15765	WTRMA003411	6.07	AC	150	1967		0	0	Commercial	8	8	3	0	19
15767	WTRMA003410	18.91	AC	150	1967		0	0	Commercial	8	8	3	5	24
15769	WTRMA003395	0.83	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
15771	WTRMA003394	11.36	CI	150	1950		0	0	SF - Residential	1	12	10	0	23
15775	WTRMA002467	1.52	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
15779	WTRMA002458	8.24	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15783	WTRMA002457	20.08	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15789	WTRMA002453	5.93	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15793	WTRMA002452	15.09	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15811	WTRMA002246	3.15	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
15813	WTRMA002247	12.26	PVC	200	1992		0	0	SF - Residential	1	4	1	10	16
15815	WTRMA002248	6.00	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
15825	WTRMA003623	8.72	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
15827	WTRMA003624	6.43	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
15833	WTRMA003618	7.76	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
15853	WTRMA003399	22.03	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
15855	WTRMA003402	150.46	CI	150	1952		2	12	SF - Residential	1	12	10	0	35
15857	WTRMA003403	1.49	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
15863	WTRMA003404	13.89	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
15869	WTRMA003389	5.86	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
15871	WTRMA003388	4.09	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
15873	WTRMA005306	6.41	CI	150	1954		0	0	Industrial	7	12	10	0	29
15877	WTRMA002448	8.48	AC	150	1980		0	0	SF - Residential	1	6	3	0	10

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
15879	WTRMA002443	15.88	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15889	WTRMA002441	13.54	AC	150	1980		0	0	SF - Residential	1	6	3	5	15
15895	WTRMA002440	8.12	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15901	WTRMA002240	51.28	PVC	200	1992		0	0	SF - Residential	1	4	1	10	16
15903	WTRMA002241	5.51	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
15909	WTRMA002236	7.09	AC	150	1977		0	0	SF - Residential	1	6	3	10	20
15913	WTRMA002235	8.53	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
15915	WTRMA002239	124.52	AC	150	1977		0	0	SF - Residential	1	6	3	10	20
15917	WTRMA002234	87.33	AC	150	1977		0	0	Institutional	10	6	3	0	19
15919	WTRMA002233	8.29	AC	150	1977		0	0	Institutional	10	6	3	0	19
15923	WTRMA002224	65.59	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
15931	WTRMA003608	25.83	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
15933	WTRMA003609	15.18	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
15935	WTRMA003611	9.12	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
15939	WTRMA003605	48.25	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
15943	WTRMA003603	2.13	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
15945	WTRMA003604	6.00	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
15949	WTRMA003382	6.75	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
15951	WTRMA003380	20.58	AC	150	1975		0	0	Industrial	7	8	3	0	18
15953	WTRMA003381	1.02	AC	150	1982		0	0	Industrial	7	6	3	0	16
15955	WTRMA003379	87.17	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
15957	WTRMA003383	13.71	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
15959	WTRMA003384	1.00	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
15961	WTRMA003378	4.09	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
15967	WTRMA004072	5.56	AC	200	1974		0	0	Industrial	7	8	3	0	18
15971	WTRMA004074	26.49	AC	200	1974		0	0	Industrial	7	8	3	0	18
15975	WTRMA002435	6.52	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15981	WTRMA002434	21.63	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15983	WTRMA002430	9.14	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
15989	WTRMA002426	2.53	AC	150	1981		0	0	Commercial	8	6	3	0	17
15991	WTRMA002423	77.74	AC	200	1981		0	0	SF - Residential	1	6	3	0	10
15993	WTRMA002421	1.50	AC	300	1981		0	0	SF - Residential	1	6	3	0	10
15997	WTRMA002420	7.71	AC	300	1981		0	0	SF - Residential	1	6	3	0	10
16001	WTRMA002231	4.12	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16007	WTRMA002214	4.52	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16015	WTRMA002219	18.73	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16017	WTRMA002232	13.33	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16019	WTRMA002223	6.19	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16021	WTRMA002218	6.46	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16023	WTRMA002217	99.41	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16027	WTRMA003598	11.02	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
16031	WTRMA003597	12.08	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
16033	WTRMA003594	12.13	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
16047	WTRMA004071	92.85	AC	150	1967		0	0	Industrial	7	8	3	0	18
16049	WTRMA004069	6.40	AC	150	1974		0	0	Industrial	7	8	3	0	18
16053	WTRMA004066	149.50	AC	200	1974		0	0	Industrial	7	8	3	5	23
16055	WTRMA004067	119.74	AC	200	1974		0	0	Commercial	8	8	3	0	19
16057	WTRMA004068	2.00	AC	150	1974		0	0	Industrial	7	8	3	0	18
16063	WTRMA005057	5.96	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
16065	WTRMA003421	109.92	AC	150	1967		0	0	SF - Residential	1	8	3	0	12
16071	WTRMA003420	1.07	AC	150	1967		0	0	SF - Residential	1	8	3	0	12
16077	WTRMA002424	7.29	AC	200	1981		0	0	Commercial	8	6	3	0	17
16079	WTRMA002425	118.48	AC	200	1981		0	0	Commercial	8	6	3	0	17
16085	WTRMA002414	5.04	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
16089	WTRMA002411	79.91	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
16091	WTRMA002413	21.78	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
16097	WTRMA002408	8.50	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
16099	WTRMA002213	13.44	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16101	WTRMA002211	76.38	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16103	WTRMA002212	90.05	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16105	WTRMA002210	15.79	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16107	WTRMA002222	31.41	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16109	WTRMA002227	18.51	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16111	WTRMA002228	106.41	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16117	WTRMA002206	6.96	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16119	WTRMA002209	59.69	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16123	WTRMA002201	52.12	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
16151	WTRMA002615	2.00	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
16159	WTRMA002610	6.51	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
16165	WTRMA002606	6.00	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
16175	WTRMA002410	15.31	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
16177	WTRMA002403	14.00	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
16179	WTRMA002404	5.53	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
16181	WTRMA002402	6.24	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
16185	WTRMA002398	8.60	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
16189	WTRMA002400	19.58	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
16197	WTRMA002196	36.70	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
16199	WTRMA002197	15.35	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
16201	WTRMA002200	7.75	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
16203	WTRMA002198	95.06	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
16205	WTRMA002199	61.70	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
16207	WTRMA002204	138.09	AC	200	1976		0	0	SF - Residential	1	6	3	0	10
16209	WTRMA002205	16.14	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16211	WTRMA002195	16.17	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16213	WTRMA002194	38.12	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16215	WTRMA002193	20.62	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16217	WTRMA002167	6.20	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16219	WTRMA002191	122.80	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16221	WTRMA003578	58.19	AC	400	1979		0	0	Industrial	12	6	3	0	21
16225	WTRMA003575	155.95	AC	250	1977		0	0	Industrial	7	6	3	0	16
16227	WTRMA003572	102.13	AC	250	1977		0	0	Industrial	7	6	3	0	16
16229	WTRMA003565	50.03	AC	200	1977		0	0	Industrial	7	6	3	0	16
16231	WTRMA003568	87.14	AC	200	1977		0	0	Industrial	7	6	3	0	16
16237	WTRMA003569	15.77	AC	200	1977		0	0	Industrial	7	6	3	0	16
16239	WTRMA003571	12.16	AC	250	1977		0	0	Industrial	7	6	3	0	16
16241	WTRMA003570	6.63	AC	250	1977		0	0	Industrial	7	6	3	0	16
16243	WTRMA002605	8.17	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
16249	WTRMA002603	6.20	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
16253	WTRMA002599	5.81	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
16257	WTRMA002598	15.88	PVC	250	1985		0	0	Institutional	10	6	1	0	17
16261	WTRMA002592	1.50	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
16263	WTRMA002591	1.56	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
16275	WTRMA002391	16.05	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
16279	WTRMA002389	12.90	AC	150	1980		0	0	Institutional	10	6	3	0	19
16285	WTRMA002368	151.97	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
16289	WTRMA002364	13.50	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
16291	WTRMA002365	15.27	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
16295	WTRMA002188	19.89	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16299	WTRMA002187	104.03	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16301	WTRMA002184	6.33	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16307	WTRMA002183	8.06	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16309	WTRMA002192	9.50	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
16311	WTRMA002169	15.96	AC	250	1976		0	0	SF - Residential	1	6	3	0	10
16313	WTRMA002170	8.42	AC	250	1976		0	0	SF - Residential	1	6	3	0	10
16315	WTRMA002174	150.15	AC	250	1976		0	0	SF - Residential	1	6	3	0	10
16321	WTRMA003564	241.51	AC	250	1977		0	0	Industrial	7	6	3	0	16
16323	WTRMA003561	100.48	AC	250	1977		0	0	Industrial	7	6	3	0	16
16325	WTRMA003560	2.50	AC	250	1977		0	0	Industrial	7	6	3	0	16
16333	WTRMA003548	9.78	CI	150	1954	1974	0	0	N/A	0	0	0	0	0
16335	WTRMA000349	4.94	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
16355	WTRMA002587	7.10	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16357	WTRMA002586	18.35	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16363	WTRMA002581	26.46	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16367	WTRMA002375	0.82	AC	400	1980		0	0	Institutional	15	6	3	0	24
16371	WTRMA002378	12.30	AC	350	1980		0	0	Institutional	15	6	3	0	24
16373	WTRMA002377	2.18	AC	400	1980		0	0	Institutional	15	6	3	0	24
16379	WTRMA002385	10.25	AC	300	1980		0	0	Commercial	8	6	3	10	27
16391	WTRMA002171	6.44	AC	250	1976		0	0	SF - Residential	1	6	3	0	10
16393	WTRMA002175	6.40	AC	250	1976		0	0	SF - Residential	1	6	3	0	10
16395	WTRMA002176	70.07	AC	250	1976		0	0	SF - Residential	1	6	3	0	10
16397	WTRMA002181	16.00	AC	250	1976		0	0	SF - Residential	1	6	3	10	20
16401	WTRMA002180	90.98	AC	250	1976		0	0	SF - Residential	1	6	3	0	10
16405	WTRMA002168	39.63	AC	250	1976		0	0	SF - Residential	1	6	3	0	10
16407	WTRMA002177	12.64	AC	250	1976		0	0	SF - Residential	1	6	3	0	10
16415	WTRMA002163	6.49	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
16417	WTRMA003537	10.05	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16421	WTRMA003541	1.23	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16423	WTRMA003544	4.28	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16429	WTRMA003536	89.44	CI	150	1954	1995	0	0	N/A	0	0	0	0	0
16431	WTRMA003547	3.36	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16433	WTRMA003545	13.95	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16435	WTRMA003546	0.99	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16437	WTRMA003532	6.39	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
16439	WTRMA003535	69.22	AC	250	1967		0	0	Commercial & Industrial	8	8	3	10	29
16441	WTRMA003533	5.74	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
16445	WTRMA002578	83.32	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16449	WTRMA002575	95.53	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16457	WTRMA002572	14.18	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16461	WTRMA002571	6.78	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16463	WTRMA002583	75.88	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16465	WTRMA002582	13.62	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16467	WTRMA002380	1.63	AC	300	1980		0	0	Institutional	10	6	3	0	19
16469	WTRMA002376	6.03	AC	400	1980		0	0	Institutional	15	6	3	0	24
16471	WTRMA002370	14.03	AC	400	1980		0	0	Institutional	15	6	3	0	24
16473	WTRMA002372	59.52	AC	400	1980		0	0	Institutional	15	6	3	0	24
16475	WTRMA002371	25.70	AC	400	1980		0	0	Institutional	15	6	3	0	24
16481	WTRMA002362	13.96	AC	150	1980		0	0	Institutional	10	6	3	0	19
16483	WTRMA002359	74.17	AC	200	1980		0	0	Institutional	10	6	3	0	19
16491	WTRMA002361	76.85	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
16503	WTRMA002156	13.23	PVC	200	1985		0	0	SF - Residential	1	6	1	5	13
16511	WTRMA004103	13.35	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
16513	WTRMA004101	6.34	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
16515	WTRMA004102	80.64	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
16519	WTRMA003534	5.78	AC	250	1967		0	0	Commercial & Industrial	8	8	3	10	29
16525	WTRMA003529	6.20	AC	200	1967		0	0	Industrial	7	8	3	0	18
16529	WTRMA003527	1.02	AC	200	1967		0	0	Industrial	7	8	3	0	18
16535	WTRMA003524	233.02	AC	200	1967		0	0	Industrial	7	8	3	0	18
16537	WTRMA003519	2.89	AC	200	1967		0	0	Industrial	7	8	3	0	18
16539	WTRMA003521	1.50	AC	200	1967		0	0	Industrial	7	8	3	0	18
16541	WTRMA003517	139.50	AC	200	1966		0	0	Industrial	7	8	3	0	18
16545	WTRMA002567	6.57	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16551	WTRMA002566	99.79	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16553	WTRMA002570	109.71	AC	150	1975		1	6	SF - Residential	1	8	3	0	18
16555	WTRMA002564	40.95	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16557	WTRMA002566	42.46	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16559	WTRMA002563	5.92	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16561	WTRMA002562	43.83	AC	250	1974		0	0	SF - Residential	1	8	3	0	12
16565	WTRMA002560	22.54	AC	150	1974		0	0	SF - Residential	1	8	3	5	17
16569	WTRMA002557	28.93	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16571	WTRMA002356	6.31	AC	200	1980		0	0	Institutional	10	6	3	0	19
16573	WTRMA002355	86.06	AC	200	1980		0	0	Institutional	10	6	3	0	19
16575	WTRMA002354	8.79	AC	200	1980		0	0	Institutional	10	6	3	0	19
16577	WTRMA002515	6.74	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16579	WTRMA002336	143.14	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16581	WTRMA002351	6.42	AC	250	1973		0	0	SF - Residential	1	8	3	0	12
16583	WTRMA002352	42.29	AC	250	1973		0	0	SF - Residential	1	8	3	0	12
16587	WTRMA002350	49.98	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16599	WTRMA003716	120.83	AC	150	1978		0	0	Commercial	8	6	3	0	17
16601	WTRMA003719	19.98	AC	150	1978		0	0	Commercial	8	6	3	5	22
16617	WTRMA004285	100.52	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
16619	WTRMA005378	11.52	CI	150	1954	1995	0	0	N/A	0	0	0	0	0
16621	WTRMA004963	0.70	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
16623	WTRMA003520	434.69	CI	150	1967	1967	0	0	N/A	0	0	0	0	0
16629	WTRMA003515	202.06	AC	200	1966		0	0	Industrial	7	8	3	5	23

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
16631	WTRMA003511	10.94	AC	150	1969		0	0	Parks, open space and trails	1	8	3	0	12
16633	WTRMA003514	4.81	AC	150	1974		0	0	Parks, open space and trails	1	8	3	0	12
16635	WTRMA003512	6.11	AC	200	1969		0	0	Parks, open space and trails	1	8	3	0	12
16637	WTRMA003509	5.97	AC	150	1969		0	0	Institutional	10	8	3	0	21
16643	WTRMA003507	179.43	CI	150	1955	1974	0	0	N/A	0	0	0	0	0
16645	WTRMA003492	8.92	AC	200	1974		0	0	Industrial	7	8	3	0	18
16647	WTRMA003494	9.59	AC	200	1974		0	0	Industrial	7	8	3	5	23
16649	WTRMA002556	28.99	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16651	WTRMA002555	14.20	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16655	WTRMA002554	112.93	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16659	WTRMA002551	24.53	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16661	WTRMA002550	90.27	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16663	WTRMA002549	6.19	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16667	WTRMA002547	81.71	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16669	WTRMA002544	5.96	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16673	WTRMA002344	1.12	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16675	WTRMA002343	10.84	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16679	WTRMA002339	2.69	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16681	WTRMA002342	99.66	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16685	WTRMA002338	40.57	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16689	WTRMA002332	61.28	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16693	WTRMA002331	8.44	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16695	WTRMA002327	5.87	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16699	WTRMA004962	291.23	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
16701	WTRMA004964	92.59	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
16703	WTRMA004423	720.09	STL	762	1982		0	0	Industrial	12	6	1	0	19
16725	WTRMA003490	83.65	AC	150	1972		1	6	Commercial	8	8	3	0	25
16727	WTRMA003489	6.41	AC	150	1972		0	0	Institutional & commercial	10	8	3	10	31
16731	WTRMA003487	20.67	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
16733	WTRMA003551	5.80	AC	250	1977		0	0	Industrial	7	6	3	0	16
16735	WTRMA003486	54.37	AC	150	1978		0	0	Commercial	8	6	3	0	17
16737	WTRMA003485	6.50	AC	150	1978		0	0	Commercial & SF - residential	8	6	3	5	22
16739	WTRMA003491	141.79	AC	200	1974		0	0	Industrial	7	8	3	0	18
16741	WTRMA003493	39.08	AC	200	1974		0	0	Industrial	7	8	3	0	18
16747	WTRMA002543	5.59	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16749	WTRMA002542	80.70	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16751	WTRMA002539	7.03	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16757	WTRMA002538	8.62	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16761	WTRMA002533	6.44	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16765	WTRMA002532	6.77	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16767	WTRMA002536	165.06	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16769	WTRMA002537	17.37	AC	150	1974		0	0	Institutional	10	8	3	0	21
16773	WTRMA002328	36.18	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16775	WTRMA002322	67.47	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16779	WTRMA002319	19.64	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16783	WTRMA002317	115.61	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16785	WTRMA002318	6.29	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16787	WTRMA002353	0.98	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16789	WTRMA002314	2.98	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16791	WTRMA002315	0.63	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16793	WTRMA002316	28.20	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16795	WTRMA002311	2.70	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16809	WTRMA003689	6.70	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
16813	WTRMA003686	6.11	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
16817	WTRMA003484	20.10	AC	150	1979		0	0	SF - Residential	1	6	3	10	20
16819	WTRMA003483	2.30	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
16827	WTRMA003477	2.59	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
16829	WTRMA003476	197.52	AC	150	1979		3	18	SF - Residential	1	6	3	5	33
16831	WTRMA003552	10.94	AC	400	1979		0	0	Industrial	12	6	3	0	21
16833	WTRMA003553	6.60	AC	400	1979		0	0	Industrial	12	6	3	0	21
16835	WTRMA003554	87.19	AC	400	1979		0	0	Industrial	12	6	3	0	21
16841	WTRMA002531	91.96	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16849	WTRMA002528	132.42	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16853	WTRMA002525	5.87	AC	150	1975		0	0	SF - Residential	1	8	3	5	17
16855	WTRMA002524	5.38	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16857	WTRMA002523	108.97	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16863	WTRMA003010	26.44	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16865	WTRMA002520	6.31	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16867	WTRMA002313	100.29	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16869	WTRMA002312	0.96	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16871	WTRMA002310	21.27	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16875	WTRMA002309	73.51	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16879	WTRMA002306	6.27	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16881	WTRMA002324	50.28	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16883	WTRMA002326	61.70	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16885	WTRMA002325	6.26	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16887	WTRMA002323	8.23	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16889	WTRMA002335	19.54	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16891	WTRMA002305	13.45	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16901	WTRMA003683	20.29	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
16905	WTRMA003674	12.31	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
16907	WTRMA003671	14.74	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
16909	WTRMA003670	63.04	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
16917	WTRMA003557	41.49	AC	400	1979		0	0	Industrial	12	6	3	0	21
16919	WTRMA003472	152.42	AC	200	1977		1	6	Industrial	7	6	3	0	22
16925	WTRMA003475	59.24	AC	200	1977		0	0	Industrial	7	6	3	0	16
16931	WTRMA003471	51.43	AC	200	1977		0	0	Industrial	7	6	3	0	16
16933	WTRMA003468	141.58	AC	200	1977		0	0	Industrial	7	6	3	0	16
16935	WTRMA003464	28.73	AC	200	1977		0	0	Industrial	7	6	3	0	16
16937	WTRMA002519	5.46	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
16941	WTRMA002509	5.86	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16945	WTRMA002508	151.56	AC	150	1974		0	0	SF - Residential	1	8	3	0	12

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
16949	WTRMA002512	147.01	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16957	WTRMA002505	7.63	AC	150	1974		0	0	SF - Residential	1	8	3	5	17
16961	WTRMA002502	18.18	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16963	WTRMA002337	13.43	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
16965	WTRMA002561	49.71	AC	250	1974		0	0	SF - Residential	1	8	3	0	12
16967	WTRMA002304	43.00	AC	250	1973		0	0	SF - Residential	1	8	3	0	12
16971	WTRMA002303	108.46	AC	250	1973		0	0	SF - Residential	1	8	3	0	12
16973	WTRMA002300	4.34	AC	250	1973		0	0	SF - Residential	1	8	3	0	12
16977	WTRMA002299	130.81	AC	250	1973		0	0	SF - Residential	1	8	3	0	12
16979	WTRMA002298	8.23	AC	250	1973		0	0	SF - Residential	1	8	3	0	12
16981	WTRMA002504	7.88	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16983	WTRMA002516	10.13	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
16985	WTRMA002297	53.77	AC	200	1972		0	0	SF - Residential	1	8	3	0	12
16989	WTRMA003676	9.17	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
16991	WTRMA003677	9.08	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
17015	WTRMA003461	139.42	AC	200	1977		0	0	Industrial	7	6	3	0	16
17017	WTRMA003458	8.25	AC	200	1977		0	0	Industrial	7	6	3	0	16
17023	WTRMA003457	3.63	AC	250	1976		0	0	Industrial	7	6	3	0	16
17029	WTRMA003452	97.78	AC	250	1976		0	0	Industrial	7	6	3	10	26
17031	WTRMA003453	61.38	AC	250	1976		0	0	Industrial	7	6	3	0	16
17033	WTRMA002503	36.38	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
17035	WTRMA002518	87.88	AC	150	1975		1	6	SF - Residential	1	8	3	0	18
17039	WTRMA002501	2.60	PVC	200	1991		0	0	Commercial	8	4	1	0	13
17041	WTRMA002500	64.94	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
17045	WTRMA002494	1.67	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
17053	WTRMA002492	12.71	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
17057	WTRMA002292	105.51	AC	200	1974		0	0	Institutional	10	8	3	5	26
17061	WTRMA002295	13.47	AC	200	1974		0	0	Institutional	10	8	3	0	21
17063	WTRMA002296	110.94	AC	200	1974		0	0	Institutional	10	8	3	0	21
17065	WTRMA002286	37.10	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
17067	WTRMA002291	8.54	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
17069	WTRMA002289	5.44	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
17071	WTRMA002287	6.03	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
17073	WTRMA002290	101.38	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
17077	WTRMA002271	45.46	AC	150	1994		0	0	SF - Residential	1	4	3	0	8
17079	WTRMA002270	6.81	AC	150	1994		0	0	SF - Residential	1	4	3	0	8
17081	WTRMA002269	45.73	AC	150	1994		0	0	SF - Residential	1	4	3	0	8
17083	WTRMA003663	9.18	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
17085	WTRMA003667	108.27	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
17087	WTRMA003664	2.69	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
17093	WTRMA003658	9.56	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
17097	WTRMA003657	8.99	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
17103	WTRMA003648	14.14	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
17105	WTRMA003456	53.60	AC	250	1976		0	0	Industrial	7	6	3	0	16
17107	WTRMA003450	85.54	AC	250	1976		0	0	Industrial	7	6	3	0	16
17113	WTRMA003449	11.15	AC	250	1976		0	0	Industrial	7	6	3	0	16
17115	WTRMA003444	7.12	AC	200	1977		0	0	Industrial	7	6	3	0	16
17119	WTRMA003443	8.57	AC	200	1977		0	0	Industrial	7	6	3	0	16
17121	WTRMA003442	16.76	AC	200	1977		0	0	Industrial	7	6	3	0	16
17123	WTRMA003448	24.23	AC	250	1979		0	0	Industrial	7	6	3	5	21
17125	WTRMA003447	22.13	AC	200	1977		0	0	Industrial	7	6	3	0	16
17129	WTRMA002486	20.93	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
17133	WTRMA002488	7.93	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
17139	WTRMA002485	1.52	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
17143	WTRMA002483	5.19	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
17145	WTRMA002480	5.84	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
17149	WTRMA002481	5.65	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
17151	WTRMA002885	6.25	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17155	WTRMA002886	12.93	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17157	WTRMA002887	2.00	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
17159	WTRMA002889	88.92	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
17161	WTRMA002882	89.34	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17163	WTRMA002881	120.68	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17167	WTRMA002876	5.63	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17171	WTRMA002875	16.21	AC	150	1978		0	0	SF - Residential	1	6	3	5	15
17173	WTRMA002879	3.12	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17175	WTRMA002873	161.04	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17177	WTRMA002881	113.55	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17179	WTRMA002878	12.20	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17181	WTRMA002680	7.16	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17183	WTRMA002676	7.90	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17185	WTRMA002667	32.05	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
17187	WTRMA002668	12.19	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
17189	WTRMA002669	1.97	PVC	250	1978		0	0	SF - Residential	1	6	1	0	8
17191	WTRMA002670	3.76	PVC	200	1978		0	0	SF - Residential	1	6	1	0	8
17195	WTRMA002671	53.52	PVC	200	1978		0	0	SF - Residential	1	6	1	0	8
17199	WTRMA002674	6.33	PVC	200	1978		0	0	SF - Residential	1	6	1	0	8
17201	WTRMA003284	135.79	CI	150	1963	2005	0	0	N/A	0	0	0	0	0
17203	WTRMA003281	154.43	CI	150	1963	2005	0	0	N/A	0	0	0	0	0
17205	WTRMA003274	13.17	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
17209	WTRMA003279	127.50	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
17217	WTRMA003280	6.30	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
17219	WTRMA003273	150.86	PVC	150	2005		0	0	Institutional	10	2	1	0	13
17221	WTRMA003084	31.92	PVC	250	1988		0	0	SF - Residential	1	4	1	0	6
17223	WTRMA003076	0.80	PVC	500	1989		0	0	Parks, open space, and trails	6	4	1	0	11
17225	WTRMA003078	1.10	PVC	500	1989		0	0	Parks, open space, and trails	6	4	1	0	11
17227	WTRMA003077	1.05	PVC	500	1989		0	0	Parks, open space, and trails	6	4	1	0	11
17229	WTRMA003079	60.07	PVC	500	1987		0	0	SF - Residential	6	4	1	0	11
17231	WTRMA003075	41.13	PVC	500	1989		0	0	Parks, open space, and trails	6	4	1	0	11
17233	WTRMA003074	30.07	PVC	500	1989		0	0	Parks, open space, and trails	6	4	1	0	11

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
17235	WTRMA003080	367.90	PVC	500	1989		0	0	Parks, open space, and trails	6	4	1	0	11
17237	WTRMA003071	469.93	PVC	500	1989		0	0	Parks, open space, and trails	6	4	1	0	11
17239	WTRMA003068	256.47	PVC	500	1988		0	0	Parks, open space, and trails	6	4	1	0	11
17241	WTRMA003070	1.05	PVC	250	1988		0	0	Parks, open space, and trails	1	4	1	0	6
17243	WTRMA002872	6.39	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17245	WTRMA002871	87.03	AC	200	1978		0	0	SF - Residential	1	6	3	5	15
17247	WTRMA002870	8.08	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17249	WTRMA002874	5.03	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17251	WTRMA002868	3.86	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
17253	WTRMA002869	70.30	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
17255	WTRMA002867	90.03	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
17257	WTRMA002865	6.29	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17259	WTRMA002863	6.95	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17261	WTRMA002864	85.71	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17263	WTRMA002861	7.88	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17265	WTRMA002862	54.60	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17267	WTRMA002866	45.77	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17269	WTRMA002675	15.66	PVC	200	1978		0	0	SF - Residential	1	6	1	0	8
17271	WTRMA002866	6.35	PVC	250	1978		0	0	SF - Residential	1	6	1	0	8
17273	WTRMA002865	152.61	PVC	250	1978		0	0	SF - Residential	1	6	1	0	8
17279	WTRMA002662	13.97	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
17281	WTRMA002658	16.38	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
17287	WTRMA002861	14.11	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
17293	WTRMA003272	6.44	PVC	250	2004		0	0	Industrial	7	2	1	0	10
17295	WTRMA003271	21.57	PVC	250	2004		0	0	Industrial	7	2	1	0	10
17297	WTRMA003268	9.03	PVC	200	2006		0	0	Industrial	7	0	1	0	8
17299	WTRMA003267	75.35	PVC	400	2006		0	0	Industrial	12	0	1	0	13
17301	WTRMA003270	82.29	PVC	400	2006		0	0	Industrial	12	0	1	0	13
17303	WTRMA003263	123.71	PVC	400	2006		0	0	Industrial	12	0	1	0	13
17305	WTRMA003269	6.63	PVC	200	2006		0	0	Industrial	7	0	1	0	8
17307	WTRMA003264	11.07	PVC	250	2006		0	0	Industrial	7	0	1	0	8
17309	WTRMA003266	98.05	PVC	400	2006		0	0	Industrial	12	0	1	0	13
17311	WTRMA003265	5.65	PVC	250	2006		0	0	Industrial	7	0	1	0	8
17313	WTRMA003262	249.71	PVC	400	2006		0	0	Industrial	12	0	1	0	13
17315	WTRMA003069	33.92	PVC	500	1988		0	0	Parks, open space, and trails	6	4	1	0	11
17317	WTRMA003066	696.07	PVC	500	1988		0	0	Commercial	13	4	1	0	18
17319	WTRMA003064	103.81	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
17321	WTRMA003065	4.56	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
17323	WTRMA003062	113.15	AC	150	1975		1	6	SF - Residential	1	8	3	0	18
17325	WTRMA003059	6.05	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
17331	WTRMA003063	3.26	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
17333	WTRMA003058	17.57	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
17337	WTRMA003053	5.35	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
17339	WTRMA002859	6.54	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17341	WTRMA002860	185.20	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17345	WTRMA002858	18.85	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17349	WTRMA002854	6.33	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17351	WTRMA002855	73.92	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17353	WTRMA002853	129.03	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17355	WTRMA002852	145.15	AC	200	1978		0	0	Institutional	10	6	3	0	19
17357	WTRMA002849	8.67	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17359	WTRMA002850	15.37	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17371	WTRMA002849	2.09	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
17375	WTRMA002646	13.61	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
17379	WTRMA002644	13.79	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
17383	WTRMA002642	86.88	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
17385	WTRMA002641	8.82	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
17389	WTRMA003261	303.14	PVC	400	2006		0	0	Industrial	12	0	1	0	13
17391	WTRMA003260	1.50	PVC	400	2006		0	0	Industrial	12	0	1	0	13
17393	WTRMA003259	8.31	PVC	400	2006		0	0	Industrial	12	0	1	0	13
17399	WTRMA003256	1.36	PVC	250	2006		0	0	Industrial	7	0	1	0	8
17401	WTRMA003254	1.35	PVC	300	1986		0	0	Industrial	7	4	1	0	12
17403	WTRMA003246	1.00	PVC	250	1986		0	0	Industrial	7	4	1	0	12
17405	WTRMA003251	1.00	PVC	250	1986		0	0	Industrial	7	4	1	0	12
17407	WTRMA003247	1.00	PVC	250	1986		0	0	Industrial	7	4	1	0	12
17409	WTRMA003250	1.00	PVC	250	1986		0	0	Industrial	7	4	1	0	12
17411	WTRMA003248	1.00	PVC	300	1986		0	0	Industrial	7	4	1	0	12
17415	WTRMA003052	16.94	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
17417	WTRMA003056	91.60	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
17419	WTRMA003057	3.10	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
17421	WTRMA003047	10.63	PVC	250	1987		0	0	SF - Residential	1	4	1	10	16
17423	WTRMA003048	5.17	PVC	150	1987		0	0	Commercial	8	4	1	10	23
17425	WTRMA003049	4.50	PVC	150	1987		0	0	Commercial	8	4	1	10	23
17435	WTRMA003043	3.08	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
17437	WTRMA002848	37.86	AC	200	1978		0	0	SF - Residential	1	6	3	10	20
17439	WTRMA002851	6.08	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17441	WTRMA002844	13.21	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17443	WTRMA002845	6.37	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17447	WTRMA002843	3.78	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17451	WTRMA002840	6.32	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17453	WTRMA002839	13.68	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
17455	WTRMA002837	14.02	AC	200	1978		0	0	Institutional	10	6	3	0	19
17459	WTRMA002836	71.32	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17465	WTRMA002837	1.00	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
17467	WTRMA002638	1.00	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
17469	WTRMA002636	6.70	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
17471	WTRMA002634	1.27	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
17481	WTRMA002627	1.00	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
17483	WTRMA002628	1.65	PVC	300	1985		0	0	SF - Residential	1	6	1	0	8
17485	WTRMA002625	1.94	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
17487	WTRMA003249	1.00	PVC	300	1986		0	0	Industrial	7	4	1	0	12

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
17489	WTRMA003253	1.35	PVC	300	1986		0	0	Industrial	7	4	1	0	12
17491	WTRMA003255	1.84	PVC	300	1986		0	0	Industrial	7	4	1	0	12
17493	WTRMA003252	62.60	PVC	300	1986		0	0	Industrial	7	4	1	0	12
17497	WTRMA003244	37.22	PVC	250	1985		0	0	Industrial	7	6	1	0	14
17503	WTRMA003240	133.26	PVC	250	1985		0	0	Industrial	7	6	1	0	14
17507	WTRMA003237	1.19	PVC	250	1985		0	0	Industrial	7	6	1	0	14
17519	WTRMA003040	27.84	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
17527	WTRMA003036	6.36	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
17529	WTRMA003035	16.29	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
17537	WTRMA002833	18.63	AC	200	1978		0	0	SF - Residential	1	6	3	10	20
17539	WTRMA002832	6.35	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17541	WTRMA002831	136.64	AC	200	1978		1	6	SF - Residential	1	6	3	0	16
17543	WTRMA002818	46.63	AC	200	1977		0	0	SF - Residential	1	6	3	0	10
17545	WTRMA002819	13.58	AC	200	1977		0	0	SF - Residential	1	6	3	5	15
17547	WTRMA002820	5.95	AC	200	1977		0	0	SF - Residential	1	6	3	0	10
17551	WTRMA002821	103.54	AC	200	1977		0	0	Institutional	10	6	3	0	19
17555	WTRMA002825	6.07	AC	200	1977		0	0	Institutional	10	6	3	0	19
17557	WTRMA002824	16.02	AC	200	1977		0	0	Institutional	10	6	3	0	19
17559	WTRMA002909	15.21	AC	200	1977		0	0	Institutional	10	6	3	0	19
17567	WTRMA002623	14.74	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
17581	WTRMA002618	14.73	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
17587	WTRMA003221	1.46	AC	300	1983		0	0	Institutional	10	6	3	0	19
17595	WTRMA003234	5.55	AC	400	1983		0	0	Parks, open space and trails	6	6	3	0	15
17597	WTRMA003235	2.35	AC	400	1983		0	0	Parks, open space and trails	6	6	3	0	15
17599	WTRMA003233	1.00	AC	300	1983		0	0	Institutional	10	6	3	0	19
17601	WTRMA003231	56.38	AC	400	1983		0	0	Institutional	15	6	3	0	24
17603	WTRMA003232	1.00	AC	300	1983		0	0	Institutional	10	6	3	0	19
17607	WTRMA003225	62.27	AC	400	1983		0	0	Institutional	15	6	3	0	24
17609	WTRMA003227	1.10	AC	300	1983		0	0	Institutional	10	6	3	0	19
17611	WTRMA003226	1.50	AC	300	1983		0	0	Institutional	10	6	3	0	19
17615	WTRMA003029	2.00	PVC	150	1987		0	0	Commercial	8	4	1	0	13
17617	WTRMA003028	2.74	PVC	150	1987		0	0	Commercial	8	4	1	0	13
17619	WTRMA003030	18.94	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
17621	WTRMA003031	2.21	PVC	250	1987		0	0	Commercial	8	4	1	0	13
17625	WTRMA003021	181.49	PVC	150	2006		0	0	Commercial	8	0	1	0	9
17629	WTRMA003024	1.37	PVC	150	2006		0	0	Commercial	8	0	1	0	9
17633	WTRMA003025	189.97	PVC	150	2006		0	0	Commercial	8	0	1	0	9
17635	WTRMA002826	119.18	AC	200	1977		0	0	Institutional	10	6	3	0	19
17639	WTRMA002830	8.32	AC	200	1977		0	0	SF - Residential	1	6	3	0	10
17641	WTRMA002829	18.36	AC	200	1977		0	0	Institutional & SF - Residential	10	6	3	0	19
17643	WTRMA002815	44.28	AC	150	1975		0	0	SF - Residential	1	8	3	0	12
17645	WTRMA002816	14.24	AC	150	1975		0	0	SF - Residential	1	8	3	5	17
17647	WTRMA002814	60.90	AC	150	1975		1	6	SF - Residential	1	8	3	0	18
17649	WTRMA002813	14.00	AC	150	1975		0	0	SF - Residential	1	8	3	5	17
17653	WTRMA002810	52.90	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17655	WTRMA003286	5.10	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
17657	WTRMA002798	12.06	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
17661	WTRMA000016	1.99	AC	400	1982		0	0	Commercial & SF - residential	13	6	3	5	27
17663	WTRMA000015	13.89	AC	150	1982		0	0	Institutional	10	6	3	10	29
17665	WTRMA000121	2.00	AC	200	1982		0	0	Industrial	7	6	3	5	21
17673	WTRMA002770	9.00	AC	300	1983		0	0	Industrial	7	6	3	0	16
17687	WTRMA003220	1.54	AC	300	1983		0	0	Institutional	10	6	3	0	19
17689	WTRMA003218	32.00	PVC	250	2000		0	0	Institutional	10	2	1	0	13
17691	WTRMA003210	53.70	PVC	250	1999		0	0	Institutional	10	2	1	0	13
17695	WTRMA003213	0.68	PVC	250	1999		0	0	Institutional	10	2	1	0	13
17699	WTRMA003214	69.56	PVC	250	1999		0	0	Institutional	10	2	1	0	13
17701	WTRMA003217	5.79	PVC	250	1999		0	0	Institutional	10	2	1	0	13
17709	WTRMA003019	111.38	PVC	150	2006		0	0	Institutional	10	0	1	0	11
17711	WTRMA003018	3.45	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17713	WTRMA003017	81.24	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17715	WTRMA003016	10.03	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17719	WTRMA003013	46.59	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17725	WTRMA003008	82.60	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17727	WTRMA002801	1.40	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
17733	WTRMA002799	150.03	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
17735	WTRMA002800	14.04	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
17737	WTRMA002811	2.97	AC	250	1971		0	0	SF - Residential	1	8	3	0	12
17739	WTRMA002795	60.60	AC	250	1975		0	0	SF - Residential	1	8	3	0	12
17745	WTRMA002794	10.57	AC	250	1975		0	0	SF - Residential	1	8	3	0	12
17747	WTRMA002793	6.18	AC	250	1975		0	0	SF - Residential	1	8	3	0	12
17749	WTRMA002790	6.45	AC	250	1975		0	0	SF - Residential	1	8	3	0	12
17751	WTRMA002791	148.61	AC	250	1975		0	0	SF - Residential	1	8	3	0	12
17761	WTRMA003772	12.64	PVC	150	2006		0	0	Commercial	8	0	1	0	9
17769	WTRMA003369	0.71	PVC	200	2005		0	0	Institutional	10	2	1	0	13
17771	WTRMA003771	2.41	PVC	400	2006		0	0	Commercial	13	0	1	0	14
17773	WTRMA003775	14.16	PVC	400	2006		0	0	Institutional	15	0	1	0	16
17775	WTRMA003209	13.72	PVC	250	1999		0	0	Institutional	10	2	1	0	13
17777	WTRMA003206	1.00	PVC	300	2002		0	0	Commercial	8	2	1	0	11
17779	WTRMA003205	31.99	PVC	300	2002		0	0	Commercial	8	2	1	0	11
17781	WTRMA003208	12.00	PVC	150	2002		0	0	Commercial	8	2	1	0	11
17783	WTRMA003207	8.00	PVC	200	2002		0	0	Commercial	8	2	1	0	11
17787	WTRMA003203	92.81	PVC	300	2005		0	0	SF - Residential	1	2	1	0	4
17791	WTRMA003204	16.17	PVC	300	2005		0	0	SF - Residential	1	2	1	0	4
17793	WTRMA003197	2.18	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
17795	WTRMA003198	10.82	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
17797	WTRMA003004	1.81	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17799	WTRMA003003	157.16	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
17805	WTRMA003011	13.72	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17807	WTRMA003005	50.06	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17809	WTRMA003002	86.72	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17811	WTRMA002998	4.82	PVC	150	2006		0	0	SF - Residential	1	0	1	5	7
17813	WTRMA002999	21.60	PVC	150	2006		0	0	SF - Residential	1	0	1	5	7

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
17817	WTRMA002803	13.59	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17819	WTRMA002786	9.41	PVC	200	1975		0	0	Industrial	7	8	1	0	16
17821	WTRMA002787	18.28	PVC	200	1975		0	0	Industrial	7	8	1	0	16
17823	WTRMA002788	6.81	PVC	200	1975		0	0	Industrial	7	8	1	0	16
17825	WTRMA002789	159.00	PVC	200	1975		0	0	Industrial	7	8	1	0	16
17827	WTRMA002785	6.50	PVC	200	1975		0	0	Industrial	7	8	1	0	16
17829	WTRMA002784	2.00	AC	200	1983		0	0	Industrial	7	6	3	0	16
17831	WTRMA002783	104.13	AC	200	1983		0	0	Industrial	7	6	3	0	16
17835	WTRMA002782	2.00	PVC	200	1983		0	0	Industrial	7	6	1	0	14
17839	WTRMA002779	83.53	AC	200	1983		0	0	Industrial	7	6	3	0	16
17841	WTRMA003774	106.22	PVC	400	2006		0	0	Institutional	15	0	1	0	16
17843	WTRMA004642	1.72	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
17845	WTRMA004630	14.11	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
17847	WTRMA004627	8.57	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
17855	WTRMA003776	13.82	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
17865	WTRMA003199	37.32	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
17867	WTRMA003196	58.95	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
17869	WTRMA003195	5.84	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
17871	WTRMA003194	61.41	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
17873	WTRMA003190	3.54	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
17875	WTRMA003193	2.49	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
17877	WTRMA003191	6.47	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
17879	WTRMA003192	2.00	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
17883	WTRMA003188	4.64	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
17887	WTRMA002993	1.03	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17893	WTRMA002992	146.46	PVC	150	2006		0	0	SF - Residential	1	0	1	5	7
17895	WTRMA002996	152.07	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17897	WTRMA002997	2.20	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
17899	WTRMA002991	14.94	PVC	150	2006		0	0	Commercial	8	0	1	0	9
17901	WTRMA002990	4.76	PVC	150	2006		0	0	Commercial	8	0	1	0	9
17905	WTRMA002778	10.39	AC	200	1983		0	0	Industrial	7	6	3	0	16
17907	WTRMA002769	10.30	AC	300	1983		0	0	Industrial	7	6	3	0	16
17909	WTRMA002761	5.02	AC	300	1983		0	0	Industrial	7	6	3	0	16
17913	WTRMA002762	8.94	AC	300	1983		0	0	Industrial	7	6	3	0	16
17915	WTRMA002763	6.00	AC	300	1983		0	0	Industrial	7	6	3	0	16
17921	WTRMA002764	107.87	AC	300	1983		0	0	Industrial	7	6	3	0	16
17927	WTRMA002766	84.43	AC	300	1983		0	0	Industrial	7	6	3	0	16
17931	WTRMA003282	18.79	CI	150	1963	2005	0	0	N/A	0	0	0	0	0
17933	WTRMA003711	5.61	AC	200	1978		0	0	Commercial	8	6	3	0	17
17935	WTRMA003712	81.08	AC	200	1978		0	0	Commercial	8	6	3	0	17
17937	WTRMA003702	120.76	AC	200	1978		0	0	Commercial	8	6	3	5	22
17939	WTRMA003705	152.64	AC	200	1978		0	0	Commercial	8	6	3	5	22
17941	WTRMA003708	5.83	AC	200	1978		0	0	Commercial	8	6	3	5	22
17943	WTRMA003710	14.20	AC	200	1978		0	0	Commercial	8	6	3	0	17
17945	WTRMA003715	106.56	AC	200	1978		0	0	Commercial	8	6	3	0	17
17947	WTRMA003709	16.02	AC	200	1978		0	0	Commercial	8	6	3	0	17
17949	WTRMA003701	15.78	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17951	WTRMA003700	127.04	AC	200	1974		0	0	Institutional	10	8	3	0	21
17955	WTRMA003185	63.67	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
17957	WTRMA003183	3.10	PVC	300	2005		0	0	SF - Residential	1	2	1	0	4
17959	WTRMA003184	48.91	PVC	300	2005		0	0	SF - Residential	1	2	1	0	4
17961	WTRMA003182	3.97	PVC	300	2005		0	0	SF - Residential	1	2	1	0	4
17963	WTRMA003178	38.71	PVC	300	2005		0	0	Commercial	8	2	1	0	11
17965	WTRMA003179	77.64	PVC	300	2005		0	0	Commercial	8	2	1	0	11
17967	WTRMA003180	32.27	PVC	300	2005		0	0	SF - Residential	1	2	1	0	4
17969	WTRMA003181	67.12	PVC	300	2005		0	0	SF - Residential	1	2	1	0	4
17971	WTRMA003170	37.86	PVC	400	2005		0	0	Commercial	13	2	1	0	16
17977	WTRMA002987	181.30	PVC	150	2006		1	6	Commercial	8	0	1	0	15
17979	WTRMA002986	3.55	PVC	150	2006		0	0	Commercial	8	0	1	0	9
17981	WTRMA002984	9.79	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17983	WTRMA002982	152.69	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17985	WTRMA002983	6.40	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17987	WTRMA002985	3.91	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
17989	WTRMA002979	175.78	PVC	200	1986		0	0	Commercial	8	4	1	0	13
17995	WTRMA002981	1.83	PVC	150	1986		0	0	Commercial	8	4	1	0	13
17997	WTRMA002980	2.23	PVC	200	1986		0	0	Commercial	8	4	1	0	13
17999	WTRMA002976	13.71	PVC	200	1986		0	0	Commercial	8	4	1	0	13
18003	WTRMA002768	85.63	AC	300	1983		0	0	Industrial	7	6	3	0	16
18005	WTRMA002760	127.43	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18007	WTRMA002759	8.58	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18009	WTRMA002032	4.80	PVC	300	2002		0	0	Commercial	8	2	1	0	11
18011	WTRMA002757	18.30	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18013	WTRMA002756	5.35	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18015	WTRMA002755	1.00	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18017	WTRMA002752	7.59	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18019	WTRMA002751	1.00	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18021	WTRMA002753	110.61	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18023	WTRMA003699	9.74	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
18025	WTRMA004091	44.32	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
18027	WTRMA005418	46.33	AC	200	1968		0	0	Institutional	10	8	3	0	21
18029	WTRMA004080	102.88	AC	250	1974		0	0	Institutional	10	8	3	0	21
18031	WTRMA004764	75.68	AC	200	1967		0	0	Institutional	10	8	3	0	21
18039	WTRMA003853	313.23	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
18041	WTRMA003371	12.61	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
18043	WTRMA003366	14.00	PVC	400	1987		0	0	Parks, open space and trails	6	4	1	0	11
18045	WTRMA003364	103.01	PVC	150	1987		0	0	Parks, open space and trail	1	4	1	0	6
18049	WTRMA003363	5.00	PVC	150	1987		0	0	Parks, open space and trails	1	4	1	0	6
18051	WTRMA003172	5.05	PVC	400	2005		0	0	Commercial	13	2	1	0	16
18055	WTRMA003171	30.15	PVC	400	2005		0	0	Commercial	13	2	1	0	16
18057	WTRMA003177	21.08	PVC	300	2005		0	0	SF - Residential	1	2	1	0	4
18059	WTRMA003175	104.20	PVC	400	2005		0	0	Commercial	13	2	1	0	16
18061	WTRMA003189	14.92	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
18063	WTRMA003321	57.18	AC	200	1984		0	0	Parks, open space, and trails	1	6	3	0	10

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
18069	WTRMA003169	6.06	PVC	150	1978		0	0	SF - Residential	1	6	1	0	8
18071	WTRMA003168	13.43	PVC	150	1978		0	0	SF - Residential	1	6	1	0	8
18073	WTRMA003166	151.19	PVC	300	1994		0	0	SF - Residential	1	4	1	0	6
18075	WTRMA002974	13.72	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
18077	WTRMA002975	49.72	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
18079	WTRMA002972	13.58	AC	200	1980		0	0	SF - Residential	1	6	3	5	15
18081	WTRMA002973	37.16	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
18083	WTRMA002970	13.50	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
18085	WTRMA002971	134.15	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
18089	WTRMA002969	127.70	AC	150	1980		1	6	SF - Residential	1	6	3	0	16
18093	WTRMA002966	5.95	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
18095	WTRMA002965	13.33	AC	150	1980		0	0	SF - Residential	1	6	3	5	15
18097	WTRMA002964	99.05	AC	150	1980		0	0	SF - Residential	1	6	3	5	15
18099	WTRMA002749	14.36	PVC	250	2004		0	0	Commercial	8	2	1	0	11
18103	WTRMA002745	144.64	PVC	250	2004		0	0	Commercial	8	2	1	0	11
18107	WTRMA002748	30.21	PVC	250	2004		0	0	Commercial	8	2	1	0	11
18111	WTRMA002754	160.34	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18113	WTRMA002741	66.80	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18115	WTRMA002739	9.25	PVC	150	2004		0	0	Commercial	8	2	1	0	11
18117	WTRMA002738	54.14	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18119	WTRMA002734	37.94	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18121	WTRMA003361	113.69	PVC	200	1987		0	0	Institutional	10	4	1	0	15
18125	WTRMA003360	1.00	PVC	200	1987		0	0	Institutional	10	4	1	0	15
18127	WTRMA003359	55.97	PVC	300	1987		0	0	Institutional	10	4	1	0	15
18131	WTRMA003356	1.00	PVC	300	1987		0	0	Institutional	10	4	1	0	15
18133	WTRMA003355	56.64	PVC	300	1987		0	0	Institutional	10	4	1	0	15
18135	WTRMA003354	0.92	PVC	300	1987		0	0	Institutional	10	4	1	0	15
18137	WTRMA003353	1.00	PVC	300	1987		0	0	Institutional	10	4	1	0	15
18139	WTRMA003352	1.00	PVC	300	1987		0	0	Institutional	10	4	1	0	15
18141	WTRMA003358	1.00	PVC	300	1987		0	0	Institutional	10	4	1	0	15
18145	WTRMA003165	6.56	PVC	300	1994		0	0	SF - Residential	1	4	1	0	6
18147	WTRMA003163	0.88	AC	350	1970		0	0	Commercial	13	8	3	0	24
18149	WTRMA003164	1.12	AC	350	1970		0	0	Commercial	13	8	3	0	24
18151	WTRMA003145	17.36	AC	250	1970		0	0	Commercial	8	8	3	0	19
18153	WTRMA003148	5.99	AC	350	1970		0	0	Commercial	13	8	3	0	24
18155	WTRMA003147	5.36	AC	350	1970		0	0	Commercial	13	8	3	0	24
18157	WTRMA003154	17.14	AC	300	1976		0	0	Commercial	8	6	3	0	17
18159	WTRMA003161	7.13	AC	300	1976		0	0	Commercial	8	6	3	0	17
18161	WTRMA003158	14.38	AC	300	1976		0	0	Commercial	8	6	3	0	17
18167	WTRMA003156	15.30	AC	300	1976		0	0	Commercial	8	6	3	0	17
18169	WTRMA003157	7.02	AC	200	1976		0	0	Commercial	8	6	3	0	17
18173	WTRMA002963	82.67	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
18177	WTRMA002960	5.71	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
18179	WTRMA002959	13.45	AC	150	1980		0	0	SF - Residential	1	6	3	5	15
18181	WTRMA002955	94.53	AC	250	1977		0	0	Institutional	10	6	3	0	19
18183	WTRMA002956	1.74	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18185	WTRMA002957	4.58	AC	200	1977		0	0	SF - Residential	1	6	3	0	10
18187	WTRMA002950	83.74	AC	200	1977		0	0	Institutional	10	6	3	0	19
18191	WTRMA002952	12.37	AC	250	1977		0	0	Institutional	10	6	3	0	19
18195	WTRMA002736	9.28	PVC	150	2004		0	0	Commercial	8	2	1	0	11
18197	WTRMA002735	83.90	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18199	WTRMA002732	9.88	PVC	150	2004		0	0	Commercial	8	2	1	0	11
18201	WTRMA002733	4.50	PVC	150	2004		0	0	Commercial	8	2	1	0	11
18203	WTRMA002737	3.13	PVC	150	2004		0	0	Commercial	8	2	1	0	11
18205	WTRMA002740	6.14	PVC	150	2004		0	0	Commercial	8	2	1	0	11
18207	WTRMA002742	14.76	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18209	WTRMA002743	27.05	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18211	WTRMA002731	38.87	PVC	300	2004		0	0	Commercial	8	2	1	0	11
18215	WTRMA002730	80.91	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18221	WTRMA003351	168.14	PVC	300	1987		0	0	Institutional	10	4	1	0	15
18229	WTRMA003350	146.10	PVC	300	1987		0	0	Institutional	10	4	1	0	15
18231	WTRMA003346	1.00	PVC	300	1987		0	0	Institutional	10	4	1	0	15
18233	WTRMA003345	118.53	PVC	300	1987		0	0	Institutional	10	4	1	0	15
18235	WTRMA003341	98.59	PVC	300	1987		0	0	Parks, open space, and trails	1	4	1	0	6
18237	WTRMA003340	1.50	PVC	200	1987		0	0	Parks, open space, and trails	1	4	1	0	6
18239	WTRMA003339	2.00	PVC	200	1987		0	0	Parks, open space, and trails	1	4	1	0	6
18241	WTRMA003155	39.44	AC	300	1976		0	0	Commercial	8	6	3	0	17
18243	WTRMA003162	56.02	AC	300	1976		0	0	Commercial	8	6	3	0	17
18247	WTRMA003142	144.60	AC	350	1970		0	0	Commercial	13	8	3	0	24
18249	WTRMA003141	21.18	AC	350	1970		0	0	Commercial	13	8	3	0	24
18251	WTRMA003138	1.02	AC	350	1970		0	0	Commercial	13	8	3	0	24
18253	WTRMA003139	0.98	AC	350	1970		0	0	Commercial	13	8	3	0	24
18255	WTRMA003140	8.51	AC	350	1970		0	0	Commercial	13	8	3	0	24
18259	WTRMA003134	247.52	AC	350	1970		0	0	Commercial	13	8	3	0	24
18263	WTRMA003132	6.40	AC	350	1970		0	0	Commercial	13	8	3	0	24
18267	WTRMA002951	1.97	AC	250	1977		0	0	SF - Residential	6	8	3	0	17
18269	WTRMA002946	70.99	AC	200	1977		0	0	Institutional	10	6	3	0	19
18275	WTRMA002949	19.67	AC	200	1977		0	0	Institutional	10	6	3	0	19
18277	WTRMA002945	4.36	AC	200	1977		0	0	Institutional	1	6	3	0	10
18279	WTRMA002958	117.96	AC	200	1977		0	0	SF - Residential	1	6	3	0	10
18281	WTRMA002930	48.83	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18283	WTRMA002927	6.39	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18285	WTRMA002928	30.53	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18287	WTRMA002931	3.57	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18291	WTRMA002944	82.23	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
18293	WTRMA002728	11.92	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18295	WTRMA002724	190.23	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18301	WTRMA002723	8.58	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18303	WTRMA002722	15.16	AC	150	1978		0	0	SF - Residential	1	6	3	5	15
18305	WTRMA002727	6.22	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18307	WTRMA002721	58.94	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18309	WTRMA002718	37.75	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18311	WTRMA002719	10.19	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18313	WTRMA002720	3.31	AC	150	1978		0	0	SF - Residential	1	6	3	0	10

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
18315	WTRMA002729	2.00	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18319	WTRMA003335	1.00	AC	100	1984		0	0	Parks, open space, and trails	1	6	3	0	10
18321	WTRMA003334	1.00	AC	150	1984		0	0	Parks, open space, and trails	1	6	3	0	10
18323	WTRMA003337	195.30	AC	50	1984		0	0	Parks, open space, and trails	1	6	3	0	10
18325	WTRMA003338	20.31	AC	50	1984		0	0	Parks, open space, and trails	1	6	3	0	10
18329	WTRMA003333	13.51	AC	150	1984		0	0	Parks, open space, and trails	1	6	3	0	10
18333	WTRMA003330	27.29	AC	150	1984		0	0	Parks, open space, and trails	1	6	3	0	10
18335	WTRMA003329	1.20	AC	150	1984		0	0	Parks, open space, and trails	1	6	3	0	10
18339	WTRMA003320	29.00	AC	200	1984		0	0	Parks, open space, and trails	1	6	3	5	15
18341	WTRMA003130	18.55	PVC	200	2003		0	0	Industrial	7	2	1	0	10
18343	WTRMA003131	45.60	PVC	200	2003		0	0	Industrial	7	2	1	0	10
18345	WTRMA003129	1.00	PVC	200	2003		0	0	Industrial	7	2	1	0	10
18349	WTRMA003124	102.23	AC	250	1979		0	0	Industrial	7	6	3	0	16
18359	WTRMA003128	31.32	AC	250	1979		0	0	Industrial	7	6	3	10	26
18361	WTRMA003121	32.83	AC	200	1979		0	0	Industrial	7	6	3	0	16
18365	WTRMA002941	6.09	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
18367	WTRMA002939	8.73	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
18371	WTRMA002938	144.63	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
18375	WTRMA002925	4.38	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
18377	WTRMA002926	157.72	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
18379	WTRMA002924	2.00	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18381	WTRMA002929	8.18	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
18383	WTRMA002923	17.37	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18389	WTRMA002716	100.50	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18391	WTRMA002715	6.44	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18393	WTRMA002714	92.94	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18395	WTRMA002713	8.54	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18397	WTRMA002717	13.69	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18399	WTRMA002711	6.44	AC	200	1978		0	0	SF - Residential	1	6	3	5	15
18401	WTRMA002709	10.54	AC	150	1978		0	0	SF - Residential	1	6	3	10	20
18403	WTRMA002710	2.01	AC	200	1978		0	0	SF - Residential	1	6	3	5	15
18405	WTRMA002708	141.93	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18409	WTRMA002705	9.16	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18413	WTRMA002704	6.42	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18415	WTRMA003317	1.00	PE	50	1984		0	0	Parks, open space, and trails	1	6	1	0	8
18417	WTRMA003318	117.90	PE	50	1984		0	0	Parks, open space, and trails	1	6	1	0	8
18419	WTRMA003319	5.00	PE	50	1984		0	0	Parks, open space, and trails	1	6	1	0	8
18421	WTRMA003316	148.19	PE	50	1984		0	0	Parks, open space, and trails	1	6	1	0	8
18423	WTRMA003315	1.00	PE	50	1984		0	0	Parks, open space, and trails	1	6	1	0	8
18427	WTRMA003313	134.90	CI	150	1951	2003	0	0	N/A	0	0	0	0	0
18431	WTRMA003309	24.40	PVC	250	2003		0	0	Commerical	8	2	1	0	11
18433	WTRMA003306	11.36	PVC	250	2003		0	0	Commerical	8	2	1	0	11
18435	WTRMA003307	1.50	PVC	250	2003		0	0	Commerical	8	2	1	0	11
18445	WTRMA003114	127.88	AC	200	1979		0	0	Industrial	7	6	3	0	16
18449	WTRMA003117	98.82	AC	200	1979		0	0	Industrial	7	6	3	0	16
18457	WTRMA003111	188.60	AC	200	1979		0	0	Industrial	7	6	3	0	16
18459	WTRMA003110	15.42	AC	200	1979		0	0	Industrial	7	6	3	0	16
18463	WTRMA002920	170.68	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18467	WTRMA002917	77.07	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18469	WTRMA002916	23.92	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18471	WTRMA002934	6.89	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
18473	WTRMA002935	20.21	AC	150	1977		0	0	SF - Residential	1	6	3	0	10
18477	WTRMA002915	86.72	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18481	WTRMA002912	6.36	AC	250	1977		0	0	SF - Residential	1	6	3	5	15
18483	WTRMA002911	15.87	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18485	WTRMA002703	13.72	AC	150	1978		0	0	SF - Residential	1	6	3	5	15
18487	WTRMA002702	95.56	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18489	WTRMA002701	7.35	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18491	WTRMA002700	13.73	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18495	WTRMA002699	6.38	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18497	WTRMA002696	34.19	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18501	WTRMA002712	102.06	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18505	WTRMA002691	65.31	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18509	WTRMA003302	1.43	PVC	250	2003		0	0	Commerical	8	2	1	0	11
18511	WTRMA003311	14.19	PVC	250	2003		0	0	Commerical	8	2	1	0	11
18513	WTRMA003301	5.00	PVC	250	2003		0	0	Commerical	8	2	1	0	11
18515	WTRMA003298	1.60	PVC	250	2003		0	0	Institutional	10	2	1	0	13
18517	WTRMA003297	1.60	PVC	250	2003		0	0	Institutional	10	2	1	0	13
18521	WTRMA003296	44.23	PVC	250	2003		0	0	Institutional	10	2	1	0	13
18523	WTRMA003295	1.11	PVC	250	2003		0	0	Institutional	10	2	1	0	13
18525	WTRMA003294	31.06	PVC	250	2003		0	0	Institutional	10	2	1	0	13
18527	WTRMA003308	10.03	PVC	250	2003		0	0	Commerical	8	2	1	0	11
18529	WTRMA003323	4.58	AC	200	1984		0	0	Parks, open space, and trails	1	6	3	0	10
18531	WTRMA003322	11.95	AC	200	1984		0	0	Parks, open space, and trails	1	6	3	0	10
18539	WTRMA003104	17.89	AC	250	1979		0	0	Industrial	7	6	3	0	16
18541	WTRMA003101	81.92	AC	250	1979		0	0	Industrial	7	6	3	0	16

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
18547	WTRMA003105	6.54	AC	250	1979		0	0	Industrial	7	6	3	0	16
18549	WTRMA003106	102.19	AC	250	1979		0	0	Industrial	7	6	3	0	16
18551	WTRMA003099	15.50	AC	250	1979		0	0	Industrial	7	6	3	0	16
18553	WTRMA003091	13.32	PVC	300	1988		0	0	Commercial	8	4	1	0	13
18555	WTRMA003090	1.00	PVC	300	1988		0	0	Commercial	8	4	1	0	13
18557	WTRMA002940	15.85	AC	150	1977		0	0	SF - Residential	1	6	3	5	15
18559	WTRMA002910	160.66	AC	200	1977		0	0	SF - Residential	1	6	3	0	10
18561	WTRMA002906	2.00	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
18563	WTRMA002905	42.10	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
18565	WTRMA002907	7.16	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18567	WTRMA002908	159.09	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18569	WTRMA002904	6.73	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
18573	WTRMA002902	6.15	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18577	WTRMA002903	6.02	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18579	WTRMA002899	136.52	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18581	WTRMA002897	164.54	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18583	WTRMA002890	13.85	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18585	WTRMA002894	35.05	AC	200	1978		0	0	SF - Residential	1	6	3	10	20
18587	WTRMA002895	4.26	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18589	WTRMA002889	98.56	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18591	WTRMA002886	44.54	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18597	WTRMA002885	58.90	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18599	WTRMA002884	3.61	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18601	WTRMA002883	62.83	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18603	WTRMA002882	13.67	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18605	WTRMA002877	224.17	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18607	WTRMA002879	2.00	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
18609	WTRMA003326	314.65	AC	200	1984		0	0	Parks, open space, and trails	1	6	3	0	10
18611	WTRMA003293	10.51	CI	150	1952		0	0	Commercial	8	12	10	0	30
18613	WTRMA003291	6.46	PVC	150	2005		0	0	Institutional	10	2	1	0	13
18619	WTRMA003292	10.83	PVC	150	2005		0	0	Institutional	10	2	1	0	13
18623	WTRMA003287	4.32	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
18625	WTRMA003285	8.54	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
18627	WTRMA002808	43.46	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
18629	WTRMA003088	2.08	PVC	350	1988		0	0	Commercial	13	4	1	0	18
18631	WTRMA003094	2.50	PVC	300	1988		0	0	Commercial	8	4	1	0	13
18633	WTRMA003093	7.00	PVC	300	1988		0	0	Commercial	8	4	1	0	13
18641	WTRMA003098	19.95	PVC	500	1988		0	0	Commercial	13	4	1	0	18
18643	WTRMA003095	62.00	PVC	500	1988		0	0	Commercial	13	4	1	0	18
18645	WTRMA003092	120.51	PVC	500	1988		0	0	Commercial	13	4	1	0	18
18647	WTRMA003089	7.50	PVC	500	1988		0	0	Commercial	13	4	1	0	18
18649	WTRMA003086	8.96	PVC	500	1988		0	0	Commercial	13	4	1	0	18
18651	WTRMA003085	5.54	PVC	500	1988		0	0	Commercial	13	4	1	0	18
18655	WTRMA002892	126.62	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18659	WTRMA002898	13.72	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18661	WTRMA002896	5.45	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18663	WTRMA002932	9.26	AC	250	1977		0	0	Institutional	10	6	3	0	19
18665	WTRMA002891	6.91	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18667	WTRMA002895	19.04	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18669	WTRMA002933	38.92	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
18671	WTRMA002890	36.90	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
18673	WTRMA002888	6.15	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
18675	WTRMA002880	9.28	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
18679	WTRMA005035	21.90	PVC	400	2004		0	0	Commercial	13	2	1	0	16
18685	WTRMA005034	132.78	AC	250	1976	1991	0	0	N/A	0	0	0	0	0
18687	WTRMA005033	2.32	PVC	300	1986		0	0	Commercial	8	4	1	0	13
18689	WTRMA005032	58.74	PVC	300	1986		0	0	Commercial	8	4	1	0	13
18691	WTRMA005031	62.72	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
18697	WTRMA005028	1.68	AC	250	1976		0	0	Institutional	10	6	3	0	19
18699	WTRMA005027	9.86	AC	250	1976		0	0	Institutional	10	6	3	0	19
18705	WTRMA005024	33.30	AC	250	1976		0	0	Institutional	10	6	3	0	19
18707	WTRMA005023	39.61	AC	250	1976		0	0	Institutional	10	6	3	0	19
18709	WTRMA005022	11.14	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
18711	WTRMA004770	199.54	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
18713	WTRMA004771	1.39	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
18719	WTRMA004774	177.28	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
18721	WTRMA004775	1.32	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
18727	WTRMA004778	15.03	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
18731	WTRMA005021	5.40	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
18733	WTRMA005020	1.00	AC	250	1980		0	0	SF - Residential	1	6	3	0	10
18735	WTRMA005019	8.06	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
18737	WTRMA005018	6.54	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
18739	WTRMA005017	32.55	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
18743	WTRMA005015	139.87	AC	400	1979		0	0	Industrial	12	6	3	0	21
18745	WTRMA005014	15.66	AC	400	1979		0	0	Industrial	12	6	3	0	21
18751	WTRMA005009	142.68	AC	400	1979		0	0	Industrial	12	6	3	0	21
18753	WTRMA005012	43.32	AC	400	1979		0	0	Industrial	12	6	3	0	21
18755	WTRMA005013	12.25	AC	400	1979		0	0	Industrial	12	6	3	0	21
18757	WTRMA005002	4.64	AC	200	1978		0	0	Industrial	7	6	3	0	16
18759	WTRMA005001	8.53	AC	200	1978		0	0	Industrial	7	6	3	0	16
18761	WTRMA005000	8.59	AC	200	1978		0	0	Industrial	7	6	3	0	16
18763	WTRMA004999	6.43	AC	200	1978		0	0	Industrial	7	6	3	0	16
18765	WTRMA005008	8.86	AC	200	1978		0	0	Industrial	7	6	3	0	16
18771	WTRMA005005	121.01	AC	200	1978		0	0	Industrial	7	6	3	0	16
18777	WTRMA004998	119.01	AC	200	1978		1	6	Industrial	7	6	3	0	22
18783	WTRMA004995	129.23	AC	200	1978		0	0	Industrial	7	6	3	0	16
18789	WTRMA004992	19.58	AC	200	1978		0	0	Industrial	7	6	3	10	26
18791	WTRMA004991	9.35	AC	200	1978		0	0	Industrial	7	6	3	0	16
18793	WTRMA004990	88.64	AC	200	1978		0	0	Industrial	7	6	3	0	16
18799	WTRMA004985	163.95	AC	200	1978		0	0	Industrial	7	6	3	0	16
18805	WTRMA004984	19.13	AC	200	1978		0	0	Industrial	7	6	3	0	16
18807	WTRMA004983	14.72	AC	200	1978		0	0	Industrial	7	6	3	10	26
18809	WTRMA004982	168.41	AC	200	1978		0	0	Industrial	7	6	3	0	16
18811	WTRMA004981	164.08	AC	200	1978		0	0	Industrial	7	6	3	0	16

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
18817	WTRMA004978	5.54	AC	200	1978		0	0	Industrial	7	6	3	0	16
18819	WTRMA004977	4.04	AC	200	1978		0	0	Industrial	7	6	3	0	16
18825	WTRMA004971	90.13	AC	250	1978		1	6	Industrial	7	6	3	0	22
18831	WTRMA004970	1.35	AC	250	1978		0	0	Industrial	7	6	3	0	16
18833	WTRMA004967	1.08	AC	200	1976		0	0	Industrial	7	6	3	0	16
18835	WTRMA004966	8.35	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
18837	WTRMA004965	14.63	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
18841	WTRMA004958	15.04	AC	250	1980		0	0	Institutional	10	6	3	0	19
18845	WTRMA004956	117.71	AC	200	1980		0	0	Institutional	10	6	3	0	19
18847	WTRMA004955	8.37	AC	200	1980		0	0	Institutional	10	6	3	0	19
18851	WTRMA004954	15.58	PVC	150	1994		0	0	Commercial	8	4	1	0	13
18853	WTRMA004953	61.51	PVC	150	1994		0	0	Commercial	8	4	1	0	13
18855	WTRMA004952	14.22	PVC	150	1994		0	0	Commercial	8	4	1	0	13
18869	WTRMA005407	85.03	CI	150	1955	1955	0	0	N/A	0	0	0	0	0
18871	WTRMA005197	1.23	STL	300	1975		0	0	Institutional	10	8	1	0	19
18873	WTRMA005195	2.13	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
18879	WTRMA005193	29.37	CI	150	1954		0	0	Industrial	7	12	10	0	29
18883	WTRMA005177	66.18	PE	50	1999		0	0	Parks, open space and trails	1	2	1	0	4
18885	WTRMA005176	4.49	PE	50	1999		0	0	Parks, open space and trails	1	2	1	0	4
18887	WTRMA005180	50.41	PE	50	1999		0	0	Parks, open space and trails	1	2	1	0	4
18889	WTRMA005179	0.37	PE	50	1999		0	0	Parks, open space and trails	1	2	1	0	4
18891	WTRMA005185	66.19	PE	50	1999		0	0	Parks, open space and trails	1	2	1	0	4
18893	WTRMA005184	44.15	PE	50	1999		0	0	Parks, open space and trails	1	2	1	0	4
18895	WTRMA005188	51.37	PVC	50	1999		0	0	Parks, open space and trails	1	2	1	0	4
18897	WTRMA005189	3.72	PVC	50	1999		0	0	Parks, open space and trails	1	2	1	0	4
18899	WTRMA005186	3.51	PVC	150	1999		0	0	Parks, open space and trails	1	2	1	0	4
18901	WTRMA005408	77.46	CI	150	1955	1955	0	0	N/A	0	0	0	0	0
18903	WTRMA005409	106.26	CI	150	1955	1955	0	0	N/A	0	0	0	0	0
18905	WTRMA005410	121.52	CI	150	1959	1959	0	0	N/A	0	0	0	0	0
18907	WTRMA005411	4.15	CI	150	1959	1959	0	0	N/A	0	0	0	0	0
18913	WTRMA004940	8.53	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
18915	WTRMA004941	1.28	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
18917	WTRMA004944	171.12	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
18919	WTRMA004939	5.81	AC	200	1979		0	0	Commercial	8	6	3	0	17
18921	WTRMA004938	200.82	AC	200	1979		0	0	SF - Residential	1	6	3	0	10
18931	WTRMA004937	6.90	AC	150	1979		0	0	Commercial	8	6	3	0	17
18933	WTRMA004936	28.52	AC	150	1979		0	0	Commercial	8	6	3	0	17
18935	WTRMA004933	144.69	AC	150	1979		0	0	Commercial	8	6	3	0	17
18937	WTRMA004932	8.56	AC	150	1976		0	0	Industrial	7	6	3	0	16
18939	WTRMA004929	13.57	AC	150	1976		0	0	Industrial	7	6	3	0	16
18945	WTRMA005192	25.63	PVC	150	1999		0	0	Parks, open space and trails	1	2	1	0	4
18947	WTRMA005187	73.97	PVC	150	1999		0	0	Parks, open space and trails	1	2	1	0	4
18949	WTRMA005183	28.62	PVC	150	1999		0	0	Parks, open space and trails	1	2	1	0	4
18951	WTRMA005182	9.92	PVC	150	1999		0	0	Parks, open space and trails	1	2	1	0	4
18953	WTRMA005181	17.42	PVC	150	1999		0	0	Parks, open space and trails	1	2	1	0	4
18955	WTRMA005178	1.90	PVC	150	1999		0	0	Parks, open space and trails	1	2	1	0	4
18957	WTRMA005175	29.53	PVC	150	1999		0	0	Parks, open space and trails	1	2	1	0	4
18959	WTRMA005174	8.58	PVC	150	1999		0	0	Parks, open space and trails	1	2	1	0	4
18961	WTRMA005173	0.91	AC	200	1969		0	0	Parks, open space, and trails	1	8	3	0	12
18965	WTRMA005167	47.24	PVC	150	2006		0	0	Parks, open space and trails	1	0	1	0	2
18967	WTRMA004928	71.71	AC	150	1976		0	0	Industrial	7	6	3	0	16
18969	WTRMA004927	127.48	CI	150	1960	1979	0	0	N/A	0	0	0	0	0
18973	WTRMA004925	2.21	CI	150	1960	1979	0	0	N/A	0	0	0	0	0
18975	WTRMA004924	123.17	AC	150	1979		0	0	Institutional	10	6	3	0	19
18977	WTRMA004923	59.94	AC	150	1979		0	0	Institutional	10	6	3	0	19
18981	WTRMA004915	5.05	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
18983	WTRMA004914	14.81	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
18987	WTRMA004921	28.80	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
18991	WTRMA004917	5.14	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
18993	WTRMA005166	4.87	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
18997	WTRMA005162	3.44	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
19001	WTRMA005168	40.23	PVC	150	2006		0	0	Parks, open space and trails	1	0	1	0	2
19005	WTRMA005165	43.78	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
19019	WTRMA004909	5.60	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
19021	WTRMA004908	0.73	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
19023	WTRMA004907	8.19	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
19025	WTRMA004912	5.99	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
19027	WTRMA004911	13.49	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
19029	WTRMA004918	0.40	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
19031	WTRMA004916	3.24	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
19033	WTRMA004913	0.95	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
19035	WTRMA004910	0.53	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
19037	WTRMA004906	1.44	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
19039	WTRMA004905	6.23	PVC	250	1988		0	0	Commercial	8	4	1	0	13
19041	WTRMA005159	8.92	PVC	150	2006		0	0	Parks, open space and trails	1	0	1	0	2
19043	WTRMA005156	81.30	PVC	150	2006		0	0	Parks, open space and trails	1	0	1	0	2
19045	WTRMA005155	91.92	PVC	150	2006		0	0	Parks, open space and trails	1	0	1	0	2
19047	WTRMA005154	1.58	AC	200	1969		0	0	Parks, open space and trails	1	8	3	0	12
19049	WTRMA005153	11.92	AC	100	1995	1995	0	0	N/A	0	0	0	0	0
19055	WTRMA005150	25.01	PVC	200	2000		0	0	Institutional	10	2	1	0	13
19057	WTRMA005149	4.92	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
19059	WTRMA005148	50.00	PVC	200	2000		0	0	Institutional	10	2	1	0	13
19061	WTRMA005147	11.67	PVC	200	2000		0	0	Institutional	10	2	1	0	13
19063	WTRMA005146	12.11	PVC	200	2000		0	0	Institutional	10	2	1	0	13
19065	WTRMA005145	96.16	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
19067	WTRMA005144	7.57	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
19069	WTRMA005143	39.82	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
19071	WTRMA005142	16.41	PVC	100	2004		0	0	Commercial	8	2	1	0	11
19073	WTRMA005138	8.81	PVC	100	2004		0	0	Commercial	8	2	1	0	11
19075	WTRMA004904	6.24	PVC	250	1989		0	0	Commercial	8	4	1	0	13
19081	WTRMA004902	14.15	CI	150	1952		0	0	Commercial	8	12	10	0	30
19083	WTRMA004897	152.15	CI	150	1952		0	0	Commercial	8	12	10	0	30
19087	WTRMA004896	8.40	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
19091	WTRMA004892	1.45	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
19095	WTRMA004891	17.26	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
19097	WTRMA004895	152.03	CI	150	1948		1	6	SF - Residential	1	12	10	0	29
19101	WTRMA004887	19.45	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19105	WTRMA004890	130.17	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19109	WTRMA004883	7.05	CI	150	1952		0	0	Commercial & SF - residential	8	12	10	5	35
19113	WTRMA004886	57.19	CI	150	1952		1	6	Commercial	8	12	10	0	36
19119	WTRMA005139	4.94	PVC	100	2004		0	0	Commercial	8	2	1	0	11
19121	WTRMA005137	41.96	PVC	150	2004		0	0	Commercial	8	2	1	0	11
19123	WTRMA005136	3.14	PVC	150	2004		0	0	Commercial	8	2	1	0	11
19125	WTRMA005134	10.41	PVC	100	2004		0	0	Commercial	8	2	1	0	11
19127	WTRMA005135	48.52	PVC	150	2004		0	0	Commercial	8	2	1	0	11
19129	WTRMA005133	5.75	PVC	150	2004		0	0	Commercial	8	2	1	0	11
19135	WTRMA005130	8.26	PVC	150	2004		0	0	Commercial	8	2	1	0	11
19137	WTRMA005129	2.14	PVC	150	2004		0	0	Commercial	8	2	1	0	11
19139	WTRMA005128	119.49	PVC	150	1994		0	0	SF - Residential	1	4	1	0	6
19143	WTRMA004882	93.37	CI	150	1952		1	6	Commercial	8	12	10	0	36
19147	WTRMA004877	13.71	CI	150	1952		0	0	Commercial	8	12	10	0	30
19151	WTRMA004880	137.64	CI	150	1952		1	6	Commercial	8	12	10	0	36
19153	WTRMA004876	70.53	CI	150	1952		1	6	Commercial	8	12	10	0	36
19155	WTRMA004872	0.64	CI	150	1952		0	0	Commercial	8	12	10	0	30
19159	WTRMA004871	9.75	CI	150	1952		0	0	Commercial	8	12	10	0	30
19163	WTRMA004875	63.75	CI	150	1952		1	6	Commercial	8	12	10	0	36
19165	WTRMA004864	11.69	CI	150	1955		0	0	SF - Residential	1	12	10	0	23
19169	WTRMA004870	2.80	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19171	WTRMA004866	4.13	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19173	WTRMA004869	149.81	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19177	WTRMA004865	3.59	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19179	WTRMA004863	13.72	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
19183	WTRMA004860	0.30	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19185	WTRMA005126	4.97	PVC	150	2000		0	0	SF - Residential	1	2	1	0	4
19187	WTRMA005125	36.77	PVC	150	2000		0	0	Institutional	10	2	1	0	13
19189	WTRMA005124	0.96	PVC	150	2000		0	0	SF - Residential	1	2	1	0	4
19191	WTRMA005123	42.10	PVC	150	2000		0	0	Institutional	10	2	1	0	13
19193	WTRMA005122	35.20	PVC	150	2000		0	0	Institutional	10	2	1	0	13
19195	WTRMA005121	61.28	PVC	150	2000		0	0	Institutional	10	2	1	0	13
19197	WTRMA005120	36.15	PVC	150	2000		0	0	Institutional	10	2	1	0	13
19199	WTRMA005119	29.77	PVC	150	2000		0	0	Institutional	10	2	1	0	13
19201	WTRMA005118	5.00	PVC	150	2000		0	0	SF - Residential	1	2	1	0	4
19203	WTRMA005116	5.71	PVC	150	1999		0	0	Institutional	10	2	1	0	13
19205	WTRMA005117	89.20	PVC	150	2000		0	0	Institutional	10	2	1	0	13
19209	WTRMA004859	151.94	CI	150	1952		3	18	SF - Residential	1	12	10	0	41
19211	WTRMA004858	7.30	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19213	WTRMA004857	110.92	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19215	WTRMA004855	150.59	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19217	WTRMA004856	22.57	CI	150	1952		0	0	SF - Residential	1	12	10	10	33
19219	WTRMA004854	1.52	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19221	WTRMA004853	11.68	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19225	WTRMA004851	15.82	CI	150	1950		0	0	Commercial	8	12	10	0	30
19227	WTRMA004850	153.89	CI	150	1950		1	6	SF - Residential	1	12	10	0	29
19229	WTRMA004849	18.59	CI	150	1947		0	0	Commercial & SF - Residential	8	12	10	20	50
19231	WTRMA004848	145.30	CI	150	1947		3	18	SF - Residential	1	12	10	0	41
19235	WTRMA004846	121.30	CI	150	1947		2	12	Institutional	10	12	10	0	44
19237	WTRMA004845	4.86	CI	150	1947		0	0	Institutional	10	12	10	0	32
19241	WTRMA004847	37.32	CI	150	1947		0	0	Institutional & commercial	10	12	10	0	32
19243	WTRMA004842	10.73	CI	150	1947		0	0	Institutional, commercial & SF - Residential	10	12	10	0	32
19247	WTRMA005115	9.24	PVC	150	1999		0	0	Institutional	10	2	1	0	13
19251	WTRMA005113	2.01	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19253	WTRMA005112	22.96	PVC	200	1999		0	0	Commercial	8	2	1	0	11

Note: The pipes as labeled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
19255	WTRMA005111	20.20	PVC	400	1999		0	0	Commercial	13	2	1	0	16
19257	WTRMA005110	2.06	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19259	WTRMA005109	22.98	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19261	WTRMA005108	12.04	PVC	400	1999		0	0	Commercial	13	2	1	0	16
19263	WTRMA005106	12.48	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19265	WTRMA005105	7.98	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19269	WTRMA004841	20.32	CI	150	1949		0	0	Multi-family & SF - Residential	5	12	10	0	27
19271	WTRMA004838	198.50	CI	150	1949		3	18	SF - Residential	1	12	10	5	46
19275	WTRMA004837	7.77	PVC	150	2006	2009	0	0	N/A	0	0	0	0	0
19279	WTRMA004836	1.08	PVC	150	2006	2009	0	0	N/A	0	0	0	0	0
19283	WTRMA004832	1.00	CI	150	1960	2009	0	0	N/A	0	0	0	0	0
19293	WTRMA004826	1.37	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19297	WTRMA005102	2.02	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19299	WTRMA005103	11.96	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19301	WTRMA005099	19.14	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19303	WTRMA005100	8.10	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19305	WTRMA005097	19.00	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19307	WTRMA005096	8.08	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19309	WTRMA005107	29.09	PVC	300	1999		0	0	Commercial	8	2	1	0	11
19311	WTRMA005104	41.23	PVC	300	1999		0	0	Commercial	8	2	1	0	11
19313	WTRMA005101	107.73	PVC	300	1999		0	0	Commercial	8	2	1	0	11
19315	WTRMA005098	51.46	PVC	300	1999		0	0	Commercial	8	2	1	0	11
19321	WTRMA004823	179.05	CI	150	1952		2	12	Commercial	8	12	10	0	42
19323	WTRMA004827	20.11	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19325	WTRMA004819	197.94	CI	150	1955		1	6	SF - Residential	1	12	10	0	29
19333	WTRMA005412	20.12	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19335	WTRMA005413	0.76	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19339	WTRMA004814	180.23	CI	150	1952		2	12	SF - Residential	1	12	10	0	35
19341	WTRMA004813	14.01	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
19343	WTRMA004812	14.03	CI	150	1957		0	0	SF - Residential	1	10	10	0	21
19345	WTRMA004811	86.60	CI	150	1957		3	18	SF - Residential	1	10	10	0	39
19351	WTRMA005095	26.54	PVC	300	1999		0	0	Commercial	8	2	1	0	11
19353	WTRMA005093	5.09	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19355	WTRMA005094	11.94	PVC	200	1999		0	0	Commercial	8	2	1	0	11
19365	WTRMA005092	6.17	PVC	250	1986		0	0	Commercial	8	2	1	0	11
19367	WTRMA005089	19.04	PVC	250	1986		0	0	Industrial	7	4	1	0	12
19369	WTRMA005088	79.22	PVC	250	1986		0	0	Industrial	7	4	1	10	22
19371	WTRMA005085	5.69	PVC	250	1986		0	0	Industrial	7	4	1	10	22
19373	WTRMA005084	19.42	PVC	250	1986		0	0	Industrial	7	4	1	0	12
19375	WTRMA005081	2.49	PVC	400	2001		0	0	Parks, open space, and trails	6	2	1	0	9
19377	WTRMA005083	10.18	PVC	200	2001		0	0	Parks, open space, and trails	1	2	1	0	4
19379	WTRMA005082	10.17	PVC	200	2001		0	0	Parks, open space, and trails	1	2	1	0	4
19381	WTRMA005080	54.48	PVC	400	2001		0	0	Parks, open space, and trails	6	2	1	0	9
19383	WTRMA005079	19.94	PVC	400	1987		0	0	Commercial	13	4	1	0	18
19385	WTRMA005078	1.45	PVC	400	1987		0	0	Commercial	13	4	1	0	18
19401	WTRMA004799	3.53	CI	150	1957		0	0	SF - Residential	1	10	10	0	21
19403	WTRMA004798	97.27	CI	150	1957	2001	3	18	SF - Residential	1	10	10	0	39
19409	WTRMA004797	199.99	CI	150	1955		2	12	SF - Residential	1	12	10	0	35
19411	WTRMA004796	0.61	CI	150	1955		0	0	SF - Residential	1	12	10	0	23
19417	WTRMA004793	178.25	CI	150	1955		2	12	SF - Residential	1	12	10	0	35
19419	WTRMA004792	2.42	CI	150	1955		0	0	SF - Residential	1	12	10	0	23
19421	WTRMA005077	1.50	PVC	400	1987		0	0	Commercial	13	4	1	0	18
19423	WTRMA005076	4.08	PVC	400	1987		0	0	Commercial	13	4	1	0	18
19425	WTRMA005072	2.72	CI	200	1964	2001	0	0	N/A	0	0	0	0	0
19427	WTRMA005075	44.98	AC	200	1969		0	0	Parks, open space, and trails	1	8	3	0	12
19429	WTRMA005074	37.28	AC	200	1969		0	0	Commercial	8	8	3	0	19
19431	WTRMA005073	10.51	AC	200	1969		0	0	Commercial	8	8	3	0	19
19433	WTRMA005071	114.04	CI	200	1964	2001	0	0	N/A	0	0	0	0	0
19435	WTRMA005070	5.08	CI	200	1964	2001	0	0	N/A	0	0	0	0	0
19437	WTRMA005068	15.76	AC	250	1970		0	0	SF - Residential	1	8	3	0	12
19445	WTRMA005067	2.01	AC	250	1970		0	0	SF - Residential	1	8	3	0	12
19447	WTRMA005064	4.15	AC	250	1970		0	0	SF - Residential	1	8	3	0	12
19449	WTRMA005062	85.22	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
19451	WTRMA005061	44.57	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
19457	WTRMA004789	14.52	CI	150	1955		0	0	SF - Residential	1	12	10	0	23
19463	WTRMA004788	0.28	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
19465	WTRMA004785	179.21	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
19467	WTRMA004784	1.41	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
19473	WTRMA004781	13.82	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
19475	WTRMA004780	13.70	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
19477	WTRMA004779	87.51	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
19483	WTRMA005060	11.43	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
19485	WTRMA005056	7.94	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
19487	WTRMA005055	74.74	AC	200	1967		0	0	Institutional	10	8	3	0	21
19489	WTRMA005054	2.89	CI	150	1955	2002	0	0	N/A	0	0	0	0	0
19491	WTRMA005053	68.48	CI	150	1955	2002	0	0	N/A	0	0	0	0	0
19493	WTRMA005052	4.30	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
19499	WTRMA005049	8.11	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
19501	WTRMA005048	13.20	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
19503	WTRMA005047	69.43	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
19509	WTRMA005044	1.22	CI	150	1948		0	0	Commercial	8	12	10	0	30
19511	WTRMA005043	7.20	CI	150	1948		0	0	Commercial & SF - Residential	8	12	10	10	40
19513	WTRMA005042	152.36	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
19515	WTRMA005041	5.42	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
19521	WTRMA005040	7.44	CI	150	1948		0	0	SF - Residential	1	12	10	5	28
19523	WTRMA005440	3.33	PVC	300	2008		0	0	SF - Residential	1	0	1	0	2
19525	WTRMA005441	164.69	PVC	300	2008		1	6	SF - Residential	1	0	1	0	8
19527	WTRMA005442	0.94	PVC	300	2008		0	0	SF - Residential	1	0	1	0	2

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
19529	WTRMA005438	12.09	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
19543	WTRMA005286	1.00	CI	150	1964		0	0	Commercial	8	10	10	0	28
19545	WTRMA005285	151.98	CI	100	1951		1	6	Commercial	8	12	10	0	36
19553	WTRMA005281	4.10	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
19555	WTRMA005280	11.10	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
19557	WTRMA005279	39.45	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
19559	WTRMA005278	29.35	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
19561	WTRMA005277	148.14	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
19563	WTRMA005276	33.39	CI	100	1954		0	0	Commercial	8	12	10	5	35
19565	WTRMA005275	90.94	CI	100	1954		1	6	Commercial	8	12	10	0	36
19567	WTRMA005274	185.41	CI	100	1954		0	0	Commercial	8	12	10	0	30
19569	WTRMA005273	184.18	CI	100	1954		1	6	Commercial & SF - Residential	8	12	10	0	36
19571	WTRMA005272	198.00	CI	100	1954		2	12	SF - Residential	1	12	10	0	35
19573	WTRMA005271	5.63	CI	100	1954		0	0	SF - Residential	1	12	10	0	23
19575	WTRMA005270	191.76	CI	150	1954		0	0	Commercial	8	12	10	0	30
19577	WTRMA005269	92.24	CI	150	1954		0	0	Commercial	8	12	10	0	30
19579	WTRMA005268	88.21	CI	150	1954		2	12	Commercial & SF - Residential	8	12	10	0	42
19581	WTRMA005265	0.51	CI	150	1960		0	0	SF - Residential	1	10	10	0	21
19583	WTRMA003927	1.19	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
19589	WTRMA002792	16.06	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
19595	WTRMA003907	21.27	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19601	WTRMA003912	12.48	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19603	WTRMA003911	1.06	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19605	WTRMA003910	124.33	CI	150	1954		2	12	SF - Residential	1	12	10	0	35
19609	WTRMA004328	68.94	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
19615	WTRMA004322	70.28	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
19619	WTRMA004307	46.77	AC	250	1970		0	0	SF - Residential	1	8	3	0	12
19621	WTRMA004309	1.17	AC	200	1967		0	0	Commercial	8	8	3	0	19
19623	WTRMA004308	5.38	AC	250	1970		0	0	Commercial	8	8	3	0	19
19625	WTRMA004305	127.00	AC	200	1969		0	0	Institutional	10	8	3	0	21
19627	WTRMA004304	14.44	AC	200	1969		0	0	SF - Residential	1	8	3	0	12
19629	WTRMA004303	85.61	AC	200	1969		0	0	SF - Residential	1	8	3	0	12
19631	WTRMA004299	14.07	AC	200	1967		0	0	Commercial	8	8	3	0	19
19635	WTRMA005434	7.22	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
19645	WTRMA005429	12.25	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
19649	WTRMA005423	3.09	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
19655	WTRMA005266	11.38	CI	150	1954		0	0	Commercial & SF - Residential	8	12	10	0	30
19657	WTRMA005267	150.36	CI	150	1954		1	6	Commercial & SF - Residential	8	12	10	0	36
19659	WTRMA005264	7.27	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19665	WTRMA005263	15.82	AC	150	1979		0	0	SF - Residential	7	6	3	0	16
19667	WTRMA005262	23.10	AC	150	1979		0	0	Industrial	7	6	3	0	16
19671	WTRMA005258	18.03	AC	150	1979		0	0	Industrial	7	6	3	0	16
19673	WTRMA005249	2.12	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
19675	WTRMA005250	5.01	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
19677	WTRMA005251	4.57	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19679	WTRMA005257	23.67	CI	250	1960		0	0	SF - Residential	1	10	10	0	21
19681	WTRMA005252	25.32	CI	150	1954		1	6	SF - Residential	1	12	10	0	29
19683	WTRMA005253	5.89	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19685	WTRMA005254	14.30	CI	150	1954		0	0	Commercial and SF - Residential	8	12	10	0	30
19687	WTRMA005255	85.20	CI	150	1954		1	6	SF - Residential	1	12	10	0	29
19689	WTRMA005256	6.04	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19691	WTRMA005248	23.18	CI	150	1947		0	0	Commercial	8	12	10	0	30
19697	WTRMA003918	103.97	CI	250	1966		0	0	SF - Residential	1	8	10	0	19
19699	WTRMA003917	5.70	CI	250	1966		0	0	SF - Residential	1	8	10	0	19
19701	WTRMA003916	100.13	CI	250	1966		0	0	SF - Residential	1	8	10	0	19
19703	WTRMA003915	7.40	CI	250	1966		0	0	SF - Residential	1	8	10	0	19
19705	WTRMA003906	15.50	CI	150	1966		0	0	SF - Residential	1	8	10	0	19
19707	WTRMA003900	106.07	CI	150	1960		2	12	SF - Residential	1	10	10	5	38
19709	WTRMA003899	38.75	CI	150	1960		0	0	Institutional	10	10	10	0	30
19711	WTRMA003903	1.10	CI	150	1960		0	0	SF - Residential	1	10	10	0	21
19717	WTRMA003901	11.40	AC	150	1966		0	0	SF - Residential	1	8	3	5	17
19719	WTRMA003902	48.88	AC	150	1966		0	0	SF - Residential	1	8	3	5	17
19721	WTRMA004297	26.79	AC	150	1967		0	0	SF - Residential	1	8	3	0	12
19723	WTRMA004112	82.34	AC	150	1965	1975	0	0	N/A	0	0	0	0	0
19725	WTRMA004288	13.64	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
19727	WTRMA004287	178.46	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
19729	WTRMA004289	2.30	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
19731	WTRMA004290	1.00	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
19733	WTRMA004286	2.99	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
19735	WTRMA004284	6.40	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
19737	WTRMA004273	100.23	AC	200	1966		0	0	SF - Residential	1	8	3	5	17
19739	WTRMA004274	1.32	AC	200	1966		0	0	SF - Residential	1	8	3	0	12
19741	WTRMA004275	199.53	AC	200	1966		0	0	SF - Residential	1	8	3	0	12
19743	WTRMA004276	1.45	AC	200	1966		0	0	SF - Residential	1	8	3	0	12
19745	WTRMA004277	6.50	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
19749	WTRMA004440	32.22	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19751	WTRMA004441	65.60	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19753	WTRMA004442	60.83	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19755	WTRMA004443	814.56	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19757	WTRMA004369	748.92	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19759	WTRMA004439	919.65	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19761	WTRMA004438	154.36	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19763	WTRMA004437	734.84	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19765	WTRMA004435	100.00	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19767	WTRMA004436	501.20	STL	762	1982		0	0	Transmission Line	5	6	1	0	12

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
19769	WTRMA004434	452.47	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19773	WTRMA005245	1.30	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19775	WTRMA005244	180.69	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19777	WTRMA005243	1.77	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19779	WTRMA005242	119.55	CI	250	1960		0	0	SF - Residential	1	0	10	0	11
19781	WTRMA005235	0.57	AC	250	1983		0	0	SF - Residential	1	6	3	0	10
19783	WTRMA005241	0.97	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19785	WTRMA005239	5.18	CI	150	1954		0	0	Commercial, industrial, SF-residential	8	12	10	5	35
19787	WTRMA005238	0.25	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19793	WTRMA005229	160.95	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
19797	WTRMA005234	185.08	CI	150	1954		3	18	SF - Residential	1	12	10	0	41
19801	WTRMA005231	19.57	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19803	WTRMA005230	178.41	CI	150	1954		2	12	SF - Residential	1	12	10	0	35
19807	WTRMA003898	249.55	AC	250	1966		0	0	Institutional	10	8	3	0	21
19809	WTRMA003897	6.86	AC	250	1966		0	0	SF - Residential	1	8	3	0	12
19815	WTRMA003890	136.01	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19821	WTRMA003889	1.51	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19823	WTRMA003888	15.36	CI	150	1966		0	0	SF - Residential	1	8	10	0	19
19825	WTRMA003875	3.30	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
19827	WTRMA003852	6.80	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
19829	WTRMA003887	93.99	AC	250	1966		0	0	Institutional	10	8	3	0	21
19831	WTRMA003886	6.07	AC	250	1966		0	0	SF - Residential	1	8	3	0	12
19833	WTRMA003497	1.07	AC	150	1968		0	0	SF - Residential	1	8	3	10	22
19839	WTRMA004271	1.86	AC	200	1966		0	0	SF - Residential	1	8	3	0	12
19841	WTRMA004272	77.59	AC	200	1966		0	0	SF - Residential	1	8	3	0	12
19843	WTRMA004270	13.77	AC	200	1966		0	0	SF - Residential	1	8	3	5	17
19849	WTRMA004264	93.82	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
19851	WTRMA004263	6.39	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
19853	WTRMA004265	86.93	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
19855	WTRMA004266	13.89	AC	150	1966		0	0	SF - Residential	1	8	3	5	17
19857	WTRMA004260	13.84	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
19859	WTRMA004433	1173.89	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19861	WTRMA004432	604.43	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19863	WTRMA004431	1359.44	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19865	WTRMA004430	77.76	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19867	WTRMA004429	519.17	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19869	WTRMA004428	1732.82	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19871	WTRMA004417	72.80	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19873	WTRMA004409	928.56	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19875	WTRMA004370	1212.28	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19877	WTRMA004372	105.07	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19879	WTRMA004373	33.94	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19881	WTRMA005405	555.94	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19883	WTRMA004376	299.78	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19887	WTRMA005228	0.73	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19889	WTRMA005227	34.05	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19891	WTRMA005226	0.88	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19893	WTRMA005225	36.67	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19895	WTRMA005224	0.56	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19897	WTRMA005223	0.96	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19899	WTRMA005221	6.03	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19901	WTRMA005222	1.13	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19903	WTRMA005220	79.31	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19905	WTRMA005217	56.44	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19907	WTRMA003885	1.98	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19913	WTRMA003884	4.56	CI	150	1954		0	0	Commercial	8	12	10	0	30
19919	WTRMA003881	139.94	CI	150	1954		1	6	Commercial	8	12	10	0	36
19921	WTRMA003878	17.83	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19923	WTRMA003877	148.32	CI	150	1954		2	12	Institutional	10	12	10	0	44
19925	WTRMA003876	1.57	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19927	WTRMA003874	14.97	CI	150	1966		0	0	Institutional, industrial, SF-residential	10	8	10	0	28
19929	WTRMA003857	1.79	AC	150	1980		0	0	Commercial	8	6	3	0	17
19931	WTRMA003856	2.10	AC	150	1980		0	0	Commercial	8	6	3	0	17
19933	WTRMA004261	79.54	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
19935	WTRMA004254	13.82	AC	150	1971		0	0	SF - Residential	1	8	3	5	17
19937	WTRMA004256	0.96	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
19939	WTRMA004255	204.31	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
19945	WTRMA004257	131.42	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
19949	WTRMA004250	199.60	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
19951	WTRMA004251	203.00	CI	150	1963	1979	0	0	N/A	0	0	0	0	0
19953	WTRMA004246	2.00	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
19955	WTRMA004247	1.50	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
19959	WTRMA004388	913.02	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19961	WTRMA004389	330.40	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19963	WTRMA004390	463.83	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19965	WTRMA004391	399.83	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19967	WTRMA004392	933.16	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19969	WTRMA004393	308.59	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19971	WTRMA004396	14.40	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19973	WTRMA004394	336.27	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19975	WTRMA004395	760.64	STL	762	1982		0	0	Transmission Line	5	6	1	0	12

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
19977	WTRMA004397	2437.76	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19979	WTRMA004398	918.33	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19981	WTRMA004400	799.02	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19983	WTRMA004401	25.45	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
19985	WTRMA005216	3.56	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19987	WTRMA005215	2.29	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19989	WTRMA005214	0.56	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
19991	WTRMA005209	7.23	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19993	WTRMA005207	4.17	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
19995	WTRMA005213	182.95	CI	150	1954		1	6	SF - Residential	1	12	10	0	29
20001	WTRMA005210	5.05	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
20003	WTRMA005208	6.20	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
20005	WTRMA005206	115.99	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
20007	WTRMA005201	0.63	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
20009	WTRMA005204	6.78	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
20011	WTRMA005200	15.00	CI	150	1954		0	0	Commercial & residential	8	12	10	0	30
20013	WTRMA005203	0.30	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
20015	WTRMA005205	0.52	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
20017	WTRMA005199	1.31	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
20019	WTRMA005202	7.56	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
20021	WTRMA003862	10.72	AC	150	1980		0	0	Commercial	8	6	3	10	27
20023	WTRMA003861	91.06	AC	150	1980		0	0	Commercial	8	6	3	0	17
20025	WTRMA003860	41.33	AC	150	1980		0	0	Commercial	8	6	3	0	17
20027	WTRMA003859	19.43	AC	150	1980		0	0	Commercial	8	6	3	10	27
20029	WTRMA003858	145.06	AC	150	1980		0	0	Commercial	8	6	3	0	17
20031	WTRMA003851	14.19	AC	150	1976		0	0	Commercial	8	6	3	0	17
20035	WTRMA003867	7.87	AC	150	1979		0	0	Commercial	8	6	3	0	17
20039	WTRMA003866	98.05	AC	150	1979		0	0	Commercial	8	6	3	5	22
20041	WTRMA003865	15.32	AC	150	1979		0	0	Commercial	8	6	3	0	17
20047	WTRMA004244	13.72	AC	200	1978		0	0	Commercial	8	6	3	0	17
20049	WTRMA003752	2.05	AC	200	1978		0	0	Commercial	8	6	3	0	17
20051	WTRMA004238	102.79	AC	200	1978		0	0	Commercial	8	6	3	0	17
20053	WTRMA004237	8.41	AC	200	1978		0	0	Commercial	8	6	3	0	17
20055	WTRMA004236	6.40	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
20057	WTRMA004235	5.68	AC	250	1978		0	0	SF - Residential	1	6	3	0	10
20063	WTRMA004231	13.72	AC	250	1978		1	6	Commercial	8	6	3	0	23
20065	WTRMA004232	93.28	AC	250	1978		1	6	SF - Residential	1	6	3	0	16
20067	WTRMA004230	252.51	AC	150	1978		0	0	Commercial	8	6	3	0	17
20073	WTRMA004403	72.09	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20075	WTRMA004402	179.71	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20077	WTRMA004406	2615.82	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20079	WTRMA004407	74.81	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20081	WTRMA004408	156.85	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20083	WTRMA004410	2194.81	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20085	WTRMA004412	4.24	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20087	WTRMA004414	4.24	STL	762	1982		0	0	Industrial	12	6	1	0	19
20089	WTRMA004413	51.60	STL	762	1982		0	0	Industrial	12	6	1	0	19
20091	WTRMA004411	64.08	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20093	WTRMA004415	37.19	STL	762	1982		0	0	Industrial	12	6	1	0	19
20095	WTRMA004416	98.97	STL	762	1982		0	0	Industrial	12	6	1	0	19
20097	WTRMA004419	10.00	STL	762	1982		0	0	Industrial	12	6	1	0	19
20099	WTRMA003415	70.14	AC	150	1967		0	0	Industrial	7	8	3	0	18
20101	WTRMA003416	16.69	AC	150	1967		0	0	SF - Residential	1	8	3	0	12
20103	WTRMA003417	6.50	AC	150	1967		0	0	SF - Residential	1	8	3	0	12
20105	WTRMA003418	6.29	AC	150	1967		0	0	SF - Residential	1	8	3	0	12
20107	WTRMA003424	16.97	AC	150	1967		0	0	SF - Residential	1	8	3	0	12
20109	WTRMA003419	13.69	AC	150	1967		0	0	Commercial & industrial	8	8	3	0	19
20111	WTRMA003425	4.90	AC	150	1967		0	0	Commercial & industrial	8	8	3	0	19
20113	WTRMA004061	6.40	AC	250	1970		0	0	SF - Residential	1	8	3	0	12
20115	WTRMA004062	1.46	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
20117	WTRMA004063	212.17	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
20119	WTRMA004060	4.04	AC	350	1970		0	0	SF - Residential	6	8	3	0	17
20121	WTRMA004059	0.74	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
20123	WTRMA004058	139.59	AC	300	1975		1	6	Commercial & industrial	8	8	3	0	25
20133	WTRMA003873	2.97	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
20135	WTRMA003872	7.58	AC	150	1976		0	0	SF - Residential	1	6	3	0	10
20137	WTRMA003871	94.47	AC	250	1966		0	0	Institutional, industrial, SF - residential	10	8	3	0	21
20139	WTRMA003870	5.77	AC	250	1966		0	0	SF - Residential	1	8	3	0	12
20141	WTRMA003850	4.82	AC	150	1976		0	0	Commercial	8	6	3	0	17
20143	WTRMA003849	7.50	AC	150	1976		0	0	Commercial	8	6	3	0	17
20145	WTRMA003848	14.64	CI	250	1960		0	0	Commercial	8	10	10	0	28
20147	WTRMA003847	78.25	CI	250	1960		0	0	Industrial	7	10	10	0	27
20149	WTRMA003846	9.20	CI	250	1960		0	0	Industrial	7	10	10	0	27
20151	WTRMA003845	43.05	CI	250	1960		0	0	Industrial	7	10	10	0	27
20153	WTRMA004227	5.87	AC	150	1978		0	0	Commercial	8	6	3	10	27
20155	WTRMA004226	6.16	AC	150	1978		0	0	Commercial	8	6	3	0	17
20157	WTRMA003773	4.00	PVC	150	2006		0	0	Commercial	8	0	1	0	9
20163	WTRMA004222	2.81	AC	150	1978		0	0	Commercial	8	6	3	10	27
20165	WTRMA004221	258.01	AC	150	1978		0	0	Commercial	8	6	3	0	17
20167	WTRMA004220	13.93	AC	150	1978		0	0	Commercial	8	6	3	0	17
20171	WTRMA004219	6.31	AC	200	1978		0	0	Commercial	8	6	3	0	17
20173	WTRMA004218	6.17	AC	200	1978		0	0	Commercial	8	6	3	0	17
20179	WTRMA004421	150.67	STL	762	1982		0	0	Industrial	12	6	1	0	19
20181	WTRMA004418	155.92	STL	762	1982		0	0	Industrial	12	6	1	0	19
20183	WTRMA004420	45.83	STL	762	1982		0	0	Industrial	12	6	1	0	19
20185	WTRMA004384	435.91	STL	762	1982		0	0	Transmission Line	5	6	1	0	12

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
20187	WTRMA004383	406.51	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20189	WTRMA004381	762.51	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20191	WTRMA004379	130.74	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20193	WTRMA004387	402.40	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20195	WTRMA004374	436.64	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20197	WTRMA004405	195.97	STL	762	1982		0	0	Transmission Line	5	6	1	0	12
20201	WTRMA005404	6.39	PVC	150	2007		0	0	SF - Residential	1	0	1	0	2
20203	WTRMA005401	11.85	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
20205	WTRMA004057	163.63	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
20207	WTRMA004056	13.73	AC	300	1975		0	0	SF - Residential	1	8	3	0	12
20209	WTRMA004055	2.95	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
20211	WTRMA004054	50.73	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
20213	WTRMA004050	1.19	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
20215	WTRMA004053	2.75	CI	150	1973		0	0	SF - Residential	1	8	10	0	19
20217	WTRMA004052	4.69	CI	150	1963	1973	0	0	N/A	0	0	0	0	0
20219	WTRMA004051	54.46	CI	150	1963	1973	0	0	N/A	0	0	0	0	0
20221	WTRMA004049	5.68	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
20223	WTRMA004048	54.47	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
20225	WTRMA004046	1.64	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
20227	WTRMA004047	1.11	CI	150	1952		0	0	SF - Residential	1	12	10	0	23
20229	WTRMA004043	3.93	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
20233	WTRMA003839	1.97	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
20235	WTRMA003840	6.02	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
20237	WTRMA003841	10.76	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
20253	WTRMA004216	13.26	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
20257	WTRMA004213	14.17	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
20259	WTRMA004215	5.90	AC	200	1978		0	0	Institutional	10	6	3	0	19
20271	WTRMA003754	7.05	AC	200	1978		0	0	Institutional	10	6	3	0	19
20273	WTRMA005420	13.66	TBD	200	1978		0	0	Institutional	10	6	1	0	17
20275	WTRMA004210	166.64	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
20279	WTRMA005403	11.82	PVC	150	2007		0	0	SF - Residential	1	0	1	0	2
20281	WTRMA005402	42.79	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
20283	WTRMA005397	12.33	PVC	150	2007		0	0	SF - Residential	1	0	1	0	2
20285	WTRMA005399	12.30	PVC	150	2007		0	0	SF - Residential	1	0	1	0	2
20287	WTRMA005398	41.68	PVC	150	2007		0	0	SF - Residential	1	0	1	0	2
20289	WTRMA005400	45.76	PVC	150	2007		0	0	SF - Residential	1	0	1	0	2
20291	WTRMA005396	94.42	AC	250	1979		0	0	Industrial	7	6	3	5	21
20295	WTRMA005394	139.06	AC	250	1979		0	0	Industrial	7	6	3	5	21
20299	WTRMA005392	139.71	AC	250	1979		0	0	Industrial	7	6	3	0	16
20301	WTRMA005390	1.81	AC	250	1976		0	0	Industrial	7	6	3	0	16
20303	WTRMA005391	11.02	AC	250	1976		0	0	Industrial	7	6	3	0	16
20305	WTRMA005389	1.82	AC	200	1976		0	0	Industrial	7	6	3	0	16
20309	WTRMA005388	140.93	AC	200	1976		0	0	Industrial	7	6	3	0	16
20315	WTRMA004042	9.42	PVC	150	2004		0	0	SF - Residential	1	2	1	20	24
20317	WTRMA004038	1.55	CI	150	1950		0	0	SF - Residential	1	12	10	0	23
20319	WTRMA004037	12.85	CI	150	1950		0	0	SF - Residential	1	12	10	0	23
20325	WTRMA004036	5.79	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20327	WTRMA004035	80.11	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20329	WTRMA004034	13.86	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20331	WTRMA004033	6.37	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20333	WTRMA004032	80.32	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20335	WTRMA003837	1.29	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
20337	WTRMA003832	5.00	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
20339	WTRMA003831	8.57	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
20343	WTRMA003827	2.21	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
20349	WTRMA003823	76.14	PVC	150	1998		0	0	SF - Residential	1	2	1	0	4
20351	WTRMA003822	2.17	PVC	150	1998		0	0	SF - Residential	1	2	1	0	4
20353	WTRMA003825	7.16	PVC	150	1998		0	0	SF - Residential	1	2	1	0	4
20355	WTRMA003826	0.57	PVC	150	1998		0	0	SF - Residential	1	2	1	0	4
20359	WTRMA004209	6.12	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
20361	WTRMA004208	6.40	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
20363	WTRMA004212	65.83	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
20365	WTRMA004211	27.42	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
20371	WTRMA004207	165.94	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
20373	WTRMA004206	6.80	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
20375	WTRMA004205	6.41	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
20381	WTRMA004203	145.15	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20387	WTRMA005385	125.96	AC	200	1976		0	0	Industrial	7	6	3	0	16
20391	WTRMA005382	49.36	AC	200	1976		0	0	Industrial	7	6	3	0	16
20393	WTRMA005381	86.23	AC	200	1976		0	0	Commercial	8	6	3	0	17
20395	WTRMA005380	66.22	AC	200	1976		0	0	Commercial	8	6	3	0	17
20397	WTRMA004901	85.95	AC	150	1978		0	0	Commercial	8	6	3	0	17
20399	WTRMA005373	108.14	CI	150	1978		0	0	SF - Residential	1	6	10	0	17
20401	WTRMA005371	292.10	CI	250	1959		0	0	Industrial	7	10	10	0	27
20403	WTRMA005372	707.45	CI	250	1959	1991	0	0	N/A	0	0	0	0	0
20405	WTRMA005370	438.40	CI	250	1959		0	0	Industrial	7	10	10	0	27
20407	WTRMA005369	0.63	CI	250	1959		0	0	Industrial	7	10	10	0	27
20409	WTRMA005368	145.73	CI	250	1959		0	0	Industrial	7	10	10	0	27
20411	WTRMA005355	0.48	STL	250	1977	1991	0	0	N/A	0	0	0	0	0
20413	WTRMA005354	0.48	STL	250	1977	1991	0	0	N/A	0	0	0	0	0
20415	WTRMA005356	1.00	STL	250	1977	1991	0	0	N/A	0	0	0	0	0
20417	WTRMA004031	13.96	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20419	WTRMA004030	5.90	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20421	WTRMA004029	79.94	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20423	WTRMA004028	13.86	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20431	WTRMA004024	13.71	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
20433	WTRMA004023	64.65	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
20439	WTRMA004020	51.20	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
20441	WTRMA004018	13.61	AC	250	1971		0	0	SF - Residential	1	8	3	0	12
20443	WTRMA003821	15.03	PVC	150	1998		0	0	SF - Residential	1	2	1	0	4
20455	WTRMA003815	6.55	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
20457	WTRMA003809	27.40	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
20459	WTRMA003810	8.55	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
20461	WTRMA003811	12.47	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
20465	WTRMA004201	13.68	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20467	WTRMA004202	147.47	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20473	WTRMA004198	38.79	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
20475	WTRMA004197	9.28	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
20477	WTRMA004200	39.21	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
20479	WTRMA004199	14.75	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
20485	WTRMA004195	29.76	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
20487	WTRMA004194	15.24	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
20489	WTRMA005358	142.22	AC	250	1977	1991	0	0	N/A	0	0	0	0	0
20491	WTRMA005357	1.00	STL	250	1977	1991	0	0	N/A	0	0	0	0	0
20493	WTRMA005359	142.21	AC	250	1977	1991	0	0	N/A	0	0	0	0	0
20495	WTRMA004348	650.85	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20497	WTRMA004347	93.00	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20499	WTRMA004346	7.19	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20501	WTRMA005352	166.02	STL	762	1982		0	0	Industrial	12	6	1	0	19
20503	WTRMA005353	521.73	STL	762	1983		0	0	Industrial	12	6	1	0	19
20505	WTRMA005341	1.35	CI	250	1983		0	0	Industrial	7	6	10	0	23
20507	WTRMA005334	35.30	AC	400	1977		0	0	Industrial	12	6	3	0	21
20509	WTRMA005323	0.80	AC	250	1983		0	0	Industrial	7	6	3	0	16
20511	WTRMA004017	91.32	AC	250	1971		0	0	Institutional	10	8	3	0	21
20513	WTRMA004016	14.22	AC	250	1969		0	0	Institutional	10	8	3	0	21
20515	WTRMA005374	3.47	AC	200	1967		0	0	Industrial	7	8	3	10	28
20517	WTRMA004903	75.53	AC	200	1967		0	0	Industrial	7	8	3	10	28
20519	WTRMA005375	1.51	AC	200	1967		0	0	Industrial	7	8	3	0	18
20521	WTRMA004014	164.32	CI	150	1960	1967	0	0	N/A	0	0	0	0	0
20523	WTRMA004009	13.70	AC	200	1967		0	0	Industrial	7	8	3	0	18
20525	WTRMA004010	152.35	AC	200	1967		0	0	Industrial	7	8	3	0	18
20527	WTRMA004011	10.06	AC	200	1967		0	0	Industrial	7	8	3	0	18
20533	WTRMA004003	13.71	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
20535	WTRMA004004	179.91	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
20539	WTRMA004960	22.71	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
20547	WTRMA003806	19.51	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
20549	WTRMA003805	22.17	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
20551	WTRMA003801	0.68	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
20553	WTRMA003800	14.95	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
20559	WTRMA003799	8.86	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
20563	WTRMA004190	147.97	AC	200	1972		0	0	SF - Residential	1	8	3	0	12
20569	WTRMA004188	10.98	AC	200	1972		0	0	SF - Residential	1	8	3	0	12
20571	WTRMA004189	20.40	AC	200	1972		0	0	SF - Residential	1	8	3	0	12
20573	WTRMA004187	144.07	AC	200	1972		0	0	SF - Residential	1	8	3	0	12
20575	WTRMA004671	13.64	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20577	WTRMA004186	173.15	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
20579	WTRMA004185	7.97	AC	150	1972		0	0	SF - Residential	1	8	3	5	17
20581	WTRMA004184	15.36	AC	150	1969		0	0	Parks, open space and trails	1	8	3	0	12
20583	WTRMA004182	17.08	AC	150	1969		0	0	Institutional, SF - Residential	10	8	3	0	21
20587	WTRMA005330	2.00	STL	400	1983		0	0	Industrial	12	6	1	0	19
20589	WTRMA005320	139.29	STL	610	1983		0	0	SF - Residential	6	6	1	5	18
20591	WTRMA005329	2.79	STL	400	1983		0	0	Industrial	12	6	1	0	19
20593	WTRMA005324	0.80	STL	610	1983		0	0	Industrial	12	6	1	0	19
20595	WTRMA005327	0.63	STL	762	1983		0	0	Industrial	12	6	1	0	19
20597	WTRMA005326	0.63	STL	610	1983		0	0	Industrial	12	6	1	0	19
20599	WTRMA005328	1.80	STL	762	1983		0	0	Industrial	12	6	1	0	19
20601	WTRMA005366	1.25	CI	250	1983		0	0	Industrial	7	6	10	0	23
20603	WTRMA005325	1.25	STL	610	1983		0	0	Industrial	12	6	1	0	19
20605	WTRMA005331	2.25	STL	400	1983		0	0	Industrial	12	6	1	0	19
20607	WTRMA005332	3.89	STL	400	1983		0	0	Industrial	12	6	1	0	19
20609	WTRMA005344	1.64	STL	200	1959		0	0	Industrial	7	10	1	0	18
20611	WTRMA004005	5.43	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
20613	WTRMA004006	86.96	AC	150	1967		0	0	SF - Residential	1	8	3	0	12
20615	WTRMA004007	6.28	AC	150	1967		0	0	SF - Residential	1	8	3	0	12
20617	WTRMA004008	92.31	AC	150	1967		0	0	SF - Residential	1	8	3	0	12
20619	WTRMA004002	0.92	AC	200	1967		0	0	Industrial	7	8	3	0	18
20621	WTRMA004000	98.05	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20623	WTRMA003999	14.32	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20625	WTRMA003998	5.72	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20627	WTRMA003996	6.66	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20629	WTRMA003995	43.15	AC	200	1961		0	0	SF - Residential	1	10	3	0	14
20631	WTRMA003992	151.90	CI	150	1950		1	6	SF - Residential	1	12	10	0	29
20633	WTRMA003991	1.91	CI	150	1950		0	0	SF - Residential	1	12	10	0	23
20637	WTRMA003804	6.64	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
20639	WTRMA003793	9.02	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
20645	WTRMA003795	8.05	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
20647	WTRMA003794	15.19	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
20649	WTRMA003798	99.33	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
20651	WTRMA003792	12.10	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
20653	WTRMA003791	54.77	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
20655	WTRMA003790	5.76	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
20661	WTRMA004178	104.45	AC	200	1969		0	0	Parks, open space and trails	1	8	3	0	12
20663	WTRMA004177	58.85	AC	200	1969		0	0	Parks, open space and trails	1	8	3	0	12
20665	WTRMA004176	37.70	AC	200	1969		0	0	Institutional	10	8	3	0	21
20667	WTRMA004175	80.83	AC	200	1969		0	0	Institutional	10	8	3	0	21
20669	WTRMA004174	112.84	AC	200	1969		0	0	Institutional	10	8	3	0	21
20671	WTRMA004173	194.94	AC	200	1969		0	0	Institutional	10	8	3	0	21
20673	WTRMA004172	6.00	AC	200	1969		0	0	SF - Residential	1	8	3	0	12
20675	WTRMA004169	6.61	AC	200	1969		0	0	SF - Residential	1	8	3	0	12
20677	WTRMA004171	99.68	AC	200	1969		0	0	SF - Residential	1	8	3	0	12
20679	WTRMA004168	6.16	AC	200	1969		0	0	SF - Residential	1	8	3	0	12
20681	WTRMA004170	31.33	AC	200	1969		0	0	SF - Residential	1	8	3	0	12
20683	WTRMA004183	112.01	AC	200	1969		0	0	Parks, open space and trails	1	8	3	0	12

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
20685	WTRMA004181	93.37	AC	200	1969		0	0	Institutional, SF - Residential	10	8	3	0	21
20687	WTRMA005342	0.61	STL	250	1959		0	0	Industrial	7	10	1	0	18
20689	WTRMA005315	2.00	AC	250	1970		0	0	Industrial	7	8	3	0	18
20691	WTRMA005336	34.36	AC	250	1959		0	0	Industrial	7	10	3	0	20
20693	WTRMA005316	2.93	AC	250	1977		0	0	Industrial	7	6	3	0	16
20695	WTRMA005339	1.30	AC	250	1959		0	0	Industrial	7	10	3	0	20
20697	WTRMA005338	1.30	AC	250	1959		0	0	Industrial	7	10	3	0	20
20699	WTRMA005340	1.35	CI	250	1983		0	0	Transmission Line	0	6	10	0	16
20701	WTRMA005367	512.01	CI	250	1959		0	0	Industrial	7	10	10	0	27
20703	WTRMA005312	13.39	AC	250	1970	1977	0	0	N/A	0	0	0	0	0
20705	WTRMA005333	28.36	AC	400	1977		0	0	Industrial	12	6	3	0	21
20707	WTRMA005335	51.55	AC	250	1959		0	0	Industrial	7	10	3	0	20
20711	WTRMA003990	12.36	CI	150	1950		0	0	SF - Residential	1	12	10	0	23
20713	WTRMA003997	82.37	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20715	WTRMA003984	17.62	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20717	WTRMA003983	79.48	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20719	WTRMA003982	5.35	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20723	WTRMA003980	5.76	AC	200	1967		1	6	SF - Residential	1	8	3	0	18
20739	WTRMA003783	5.70	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
20741	WTRMA003784	5.37	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
20753	WTRMA003778	11.88	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
20755	WTRMA004161	188.98	AC	150	1969		0	0	Commercial	8	8	3	5	24
20757	WTRMA004162	6.80	AC	150	1969		0	0	Commercial	8	8	3	0	19
20759	WTRMA004163	11.91	AC	150	1969		0	0	Commercial	8	8	3	0	19
20769	WTRMA004153	1.50	AC	150	1968		0	0	Commercial	8	8	3	0	19
20771	WTRMA004149	101.39	AC	150	1968		0	0	Commercial	8	8	3	0	19
20773	WTRMA004147	6.18	AC	150	1968		0	0	Commercial	8	8	3	0	19
20779	WTRMA004152	195.38	AC	150	1968		0	0	Commercial	8	8	3	0	19
20781	WTRMA005337	17.20	AC	250	1959		0	0	Industrial	7	10	3	0	20
20783	WTRMA005349	33.15	CI	200	1959		0	0	Industrial	7	10	10	0	27
20785	WTRMA005351	33.75	CI	200	1959		0	0	Industrial	7	10	10	0	27
20787	WTRMA005347	0.38	STL	200	1959		0	0	Industrial	7	10	1	0	18
20789	WTRMA005345	1.64	STL	200	1959		0	0	Industrial	7	10	1	0	18
20791	WTRMA005318	6.43	AC	250	1977		0	0	Industrial	7	6	3	0	16
20793	WTRMA005343	7.04	STL	250	1959		0	0	Industrial	7	10	1	0	18
20795	WTRMA005348	5.90	STL	200	1959		0	0	Industrial	7	10	1	0	18
20797	WTRMA005346	6.43	STL	200	1959		0	0	Industrial	7	10	1	0	18
20799	WTRMA005322	3.05	AC	250	1983		0	0	SF - Residential	1	6	3	0	10
20801	WTRMA003977	17.98	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
20803	WTRMA003976	65.71	CI	150	1952		1	6	Industrial	7	12	10	0	35
20805	WTRMA003386	9.08	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
20807	WTRMA005301	3.44	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
20809	WTRMA003975	79.53	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
20811	WTRMA003973	5.93	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
20817	WTRMA003974	14.00	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
20819	WTRMA003969	53.33	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
20821	WTRMA003970	125.56	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
20823	WTRMA003968	39.93	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
20825	WTRMA003965	19.69	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
20831	WTRMA003372	5.77	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
20833	WTRMA003373	6.00	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
20837	WTRMA004426	1.50	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20839	WTRMA004425	5.50	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20841	WTRMA004427	15.91	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20843	WTRMA004422	181.92	STL	762	1982		0	0	Industrial	12	6	1	0	19
20845	WTRMA004355	806.17	PVC	350	1992		0	0	Urban Expansion	6	4	1	0	11
20847	WTRMA004368	594.42	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20849	WTRMA004154	6.10	AC	150	1968		0	0	Commercial	8	8	3	0	19
20857	WTRMA004146	13.56	AC	150	1968		0	0	Commercial	8	8	3	5	24
20863	WTRMA004143	6.38	AC	150	1967		0	0	Commercial	8	8	3	5	24
20865	WTRMA004142	221.81	AC	150	1967		0	0	Commercial	8	8	3	0	19
20867	WTRMA004137	180.29	AC	150	1967		0	0	Commercial	8	8	3	0	19
20873	WTRMA004136	25.89	AC	150	1967		0	0	Commercial	8	8	3	0	19
20875	WTRMA005321	1.60	STL	610	1983		0	0	SF - Residential	6	6	1	5	18
20877	WTRMA005240	33.40	STL	600	1983		0	0	Industrial	12	6	1	0	19
20879	WTRMA005350	1.19	CI	200	1959		0	0	Industrial	7	10	10	0	27
20881	WTRMA005314	2.40	AC	400	1977		0	0	Industrial	12	6	3	0	21
20883	WTRMA005313	35.84	AC	400	1977		0	0	Industrial	12	6	3	0	21
20885	WTRMA005317	3.00	AC	250	1977		0	0	Industrial	7	6	3	0	16
20887	WTRMA005311	84.45	AC	250	1970		0	0	Industrial	7	8	3	0	18
20891	WTRMA005307	256.22	AC	150	1972		0	0	Industrial	7	8	3	0	18
20895	WTRMA005309	19.02	AC	150	1972		0	0	Industrial	7	8	3	0	18
20897	WTRMA005305	21.49	PVC	150	1994		0	0	Industrial	7	4	1	0	12
20899	WTRMA003964	56.24	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
20905	WTRMA003963	6.38	AC	150	1966		0	0	SF - Residential	1	8	3	0	12
20907	WTRMA003962	13.32	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
20909	WTRMA003961	129.33	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
20911	WTRMA003958	20.16	AC	150	1965		0	0	SF - Residential	1	10	3	10	24
20919	WTRMA003956	11.98	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
20921	WTRMA003955	13.69	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
20923	WTRMA003954	6.07	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
20925	WTRMA004367	30.09	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20927	WTRMA004366	868.75	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20929	WTRMA004363	29.49	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20931	WTRMA004362	13.00	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20933	WTRMA004361	77.68	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20935	WTRMA004365	650.73	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20937	WTRMA004364	4.55	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20939	WTRMA004360	54.57	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20941	WTRMA004359	744.55	PVC	350	1992		0	0	Commercial	13	4	1	0	18
20943	WTRMA004358	766.23	PVC	350	1992		0	0	Industrial	12	4	1	5	22
20945	WTRMA004357	311.65	PVC	350	1992		0	0	Industrial	12	4	1	0	17
20947	WTRMA004135	149.01	AC	150	1967		0	0	Commercial	8	8	3	0	19
20949	WTRMA004134	5.83	AC	150	1967		0	0	Commercial	8	8	3	0	19
20951	WTRMA004133	13.64	AC	150	1967		0	0	Commercial	8	8	3	0	19

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
20959	WTRMA004124	22.03	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20961	WTRMA004128	6.43	AC	200	1967		0	0	SF - Residential	1	8	3	10	22
20963	WTRMA004127	73.09	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20965	WTRMA004126	6.40	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20967	WTRMA004125	112.44	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20969	WTRMA004123	205.88	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
20971	WTRMA004122	13.14	AC	200	1967		0	0	SF - Residential	1	8	3	5	17
20973	WTRMA005303	228.34	PVC	150	1994		0	0	Industrial	7	4	1	0	12
20977	WTRMA005300	15.99	AC	150	1970		0	0	Commercial	8	8	3	0	19
20979	WTRMA005299	86.54	AC	150	1970		0	0	Commercial	8	8	3	0	19
20981	WTRMA005297	13.89	AC	150	1970		0	0	Commercial	8	8	3	0	19
20983	WTRMA005296	87.11	AC	150	1970		1	6	Commercial	8	8	3	5	30
20989	WTRMA004077	4.56	AC	250	1974		0	0	Institutional & Commercial	10	8	3	0	21
20991	WTRMA005063	6.93	AC	250	1974		0	0	Institutional & Commercial	10	8	3	0	21
20997	WTRMA004001	42.20	AC	150	1967		0	0	Commercial	8	8	3	0	19
21003	WTRMA003948	2.98	AC	150	1980		0	0	Commercial	8	6	3	0	17
21007	WTRMA003946	6.68	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
21009	WTRMA003945	9.11	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
21015	WTRMA003944	2.54	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
21021	WTRMA003941	125.43	CI	150	1954		2	12	SF - Residential	1	12	10	0	35
21023	WTRMA003938	21.81	CI	150	1954		0	0	SF - Residential	1	12	10	10	33
21025	WTRMA003925	5.19	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
21027	WTRMA003921	70.88	AC	150	1973		0	0	Institutional & SF - residential	10	8	3	0	21
21029	WTRMA004356	553.22	PVC	350	1992		0	0	Industrial	12	4	1	0	17
21031	WTRMA004354	793.70	PVC	350	1992		0	0	Urban Expansion	6	4	1	0	11
21033	WTRMA004351	1.00	PVC	200	1992		0	0	Urban Expansion	1	4	1	0	6
21035	WTRMA004352	15.72	PVC	350	1992		0	0	Urban Expansion	6	4	1	0	11
21037	WTRMA004349	0.75	PVC	200	1992		0	0	Urban Expansion	1	4	1	0	6
21039	WTRMA004353	1.50	PVC	350	1992		0	0	Urban Expansion	6	4	1	0	11
21041	WTRMA004350	844.17	PVC	350	1992		0	0	Urban Expansion	6	4	1	0	11
21045	WTRMA004344	13.87	AC	200	1978	1991	0	0	N/A	0	0	0	0	0
21047	WTRMA004343	87.42	AC	200	1978	1991	0	0	N/A	0	0	0	0	0
21049	WTRMA004334	84.93	AC	150	1970		0	0	Commercial	8	8	3	0	19
21051	WTRMA004335	1.21	AC	150	1970		0	0	Commercial	8	8	3	0	19
21053	WTRMA003508	11.54	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
21055	WTRMA003506	4.74	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
21057	WTRMA004105	94.17	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
21059	WTRMA003500	6.58	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
21061	WTRMA003505	94.14	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
21063	WTRMA003499	11.79	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
21065	WTRMA003498	6.57	AC	150	1968		0	0	SF - Residential	1	8	3	10	22
21067	WTRMA004676	11.80	AC	150	1968		0	0	SF - Residential	1	8	3	10	22
21071	WTRMA004681	11.80	AC	150	1968		0	0	Institutional & SF - Residential	10	8	3	0	21
21073	WTRMA004680	3.20	AC	150	1968		0	0	SF - Residential	1	8	3	0	12
21075	WTRMA003510	5.34	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
21077	WTRMA003513	95.26	AC	200	1968		0	0	SF - Residential	1	8	3	10	22
21079	WTRMA003756	45.72	AC	150	1967		0	0	Commercial	8	8	3	0	19
21081	WTRMA003516	2.00	AC	150	1967		0	0	Commercial	8	8	3	0	19
21083	WTRMA003409	113.51	AC	150	1967		0	0	Commercial	8	8	3	0	19
21085	WTRMA005294	2.00	PVC	100	1992		0	0	Industrial	7	4	1	0	12
21087	WTRMA005295	96.00	PVC	100	1992		0	0	Industrial	7	4	1	0	12
21093	WTRMA005289	30.28	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
21095	WTRMA002812	15.50	PVC	250	2005		0	0	Industrial	7	2	1	0	10
21097	WTRMA003467	44.60	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
21101	WTRMA003549	46.26	AC	400	1979		0	0	Industrial	12	6	3	0	21
21103	WTRMA005288	72.46	CI	150	1964	1990	0	0	N/A	0	0	0	0	0
21105	WTRMA005287	1.42	CI	150	1964	1990	0	0	N/A	0	0	0	0	0
21107	WTRMA003922	81.36	AC	150	1967		0	0	Institutional & SF - residential	10	8	3	0	21
21109	WTRMA003923	1.83	AC	150	1967		0	0	Institutional & SF - residential	10	8	3	0	21
21111	WTRMA003924	4.57	AC	250	1967		0	0	Institutional & SF - residential	10	8	3	0	21
21113	WTRMA002807	0.95	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
21115	WTRMA003937	6.46	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
21121	WTRMA003934	147.89	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
21127	WTRMA003930	144.19	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
21129	WTRMA003933	0.97	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
21131	WTRMA003926	13.74	AC	250	1967		0	0	SF - Residential	1	8	3	0	12
21137	WTRMA004336	13.81	AC	150	1970		0	0	Commercial	8	8	3	0	19
21139	WTRMA004337	87.17	AC	150	1970		0	0	Commercial	8	8	3	0	19
21141	WTRMA004340	14.04	AC	150	1970		0	0	Commercial & SF - Residential	8	8	3	10	29
21143	WTRMA005298	48.25	AC	150	1971		0	0	Commercial	8	8	3	0	19
21145	WTRMA004339	4.62	AC	150	1971		0	0	Commercial	8	8	3	0	19
21147	WTRMA004295	3.47	AC	150	1967		0	0	SF - Residential	1	8	3	0	12
21153	WTRMA004330	17.53	AC	200	1974		0	0	SF - Residential	1	8	3	10	22
21155	WTRMA004327	14.01	AC	200	1974		0	0	SF - Residential	1	8	3	0	12
21157	WTRMA004329	127.28	AC	200	1974		0	0	Institutional	10	8	3	0	21
21159	WTRMA004677	6.10	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
21161	WTRMA004104	6.45	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
21163	WTRMA004678	94.33	AC	200	1968		0	0	Institutional & SF - Residential	10	8	3	0	21
21165	WTRMA004682	6.29	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
21167	WTRMA004683	94.27	AC	200	1968		0	0	SF - Residential	1	8	3	0	12
21169	WTRMA005447	8.67	PVC	250	2008		0	0	Commercial	8	0	1	0	9
21171	WTRMA005446	21.62	PVC	250	2008		0	0	Commercial	8	0	1	0	9
21175	WTRMA005444	0.67	PVC	250	2008		0	0	Commercial	8	0	1	0	9
21177	WTRMA005443	1.04	PVC	250	2008		0	0	Commercial	8	0	1	0	9

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
21179	WTRMA005439	6.92	PVC	300	2008		0	0	SF - Residential	1	0	1	0	2
34980	WTRMA001713	8.51	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
93016	WTRMA005376	108.26	CI	150	1960	1967	0	0	N/A	0	0	0	0	0
93071	WTRMA005645	152.83	CI	150	1954		0	0	Commercial	8	12	10	0	30
93072	WTRMA005646	31.46	CI	150	1954		0	0	Industrial	7	12	10	0	29
93116	WTRMA004926	101.00	CI	150	1960	1979	0	0	N/A	0	0	0	0	0
93196	WTRMA003027	244.10	CI	150	1960	2006	0	0	N/A	0	0	0	0	0
93324	WTRMA005647	1.37	CI	150	1954		0	0	SF - Residential	1	12	10	0	23
93330	WTRMA005377	100.54	CI	150	1954	1995	0	0	N/A	0	0	0	0	0
93340	WTRMA003314	18.59	CI	150	1951	2003	0	0	N/A	0	0	0	0	0
101124	WTRMA004833	71.37	CI	150	1960	2009	0	0	N/A	0	0	0	0	0
103226	WTRMA005650	109.57	CI	150	1954	1995	0	0	N/A	0	0	0	0	0
103230	WTRMA005651	1.38	CI	150	1954	1995	0	0	N/A	0	0	0	0	0
103234	WTRMA005652	138.69	CI	150	1960	2006	0	0	N/A	0	0	0	0	0
103238	WTRMA005653	117.42	CI	150	1951	2003	0	0	N/A	0	0	0	0	0
103242	WTRMA005654	4.95	CI	150	1951	2003	0	0	N/A	0	0	0	0	0
103246	WTRMA005655	70.66	CI	150	1960	1979	0	0	N/A	0	0	0	0	0
103250	WTRMA005656	127.43	CI	150	1960	2009	0	0	N/A	0	0	0	0	0
106570	WTRMA005657	22.19	PVC	250	2009		0	0	Commercial	8	0	1	0	9
106575	WTRMA004828	144.66	CI	150	1955	2009	0	0	N/A	0	0	0	0	0
106586	WTRMA005658	17.01	PVC	250	2009		0	0	Commercial	8	0	1	0	9
106593	WTRMA005659	14.88	PVC	250	2009		0	0	Commercial	8	0	1	0	9
106613	WTRMA005661	2.06	PVC	250	2009		0	0	Commercial	8	0	1	0	9
106655	WTRMA005667	5.00	PVC	250	2009		0	0	Commercial	8	0	1	0	9
106665	WTRMA005668	1.47	PVC	250	2009		0	0	Commercial	8	0	1	0	9
106686	WTRMA005671	19.44	PVC	250	2009		0	0	Commercial	8	0	1	0	9
106690	WTRMA005672	8.71	PVC	150	2009		0	0	Commercial	8	0	1	0	9
106696	WTRMA003020	7.06	PVC	150	2006		0	0	Commercial	8	0	1	0	9
107015	WTRMA005682	1.98	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107022	WTRMA005683	8.92	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107026	WTRMA005684	14.96	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107030	WTRMA005685	4.07	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107037	WTRMA005686	12.92	PVC	200	200		0	0	SF - Residential	1	0	1	0	2
107041	WTRMA005687	6.35	PVC	200	200		0	0	SF - Residential	1	0	1	0	2
107048	WTRMA005688	92.81	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107059	WTRMA005690	159.67	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107070	WTRMA005692	82.50	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107077	WTRMA005693	15.02	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107084	WTRMA005694	14.97	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107092	WTRMA005696	2.64	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107100	WTRMA005698	111.46	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107111	WTRMA005700	8.64	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107115	WTRMA005701	6.07	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107133	WTRMA005704	156.93	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107140	WTRMA005705	2.80	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107148	WTRMA005707	2.47	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107155	WTRMA005708	2.14	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107162	WTRMA005709	12.02	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107166	WTRMA005710	12.12	PVC	200	2009		0	0	SF - Residential	1	0	1	0	2
107170	WTRMA005711	6.84	PVC	200	2009		0	0	SF - Residential	1	0	1	0	2
107181	WTRMA005713	107.23	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107188	WTRMA005714	2.10	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107192	WTRMA005715	36.03	PVC	200	2009		0	0	SF - Residential	1	0	1	0	2
107199	WTRMA005716	19.80	PVC	200	2009		0	0	SF - Residential	1	0	1	0	2
107210	WTRMA005718	9.50	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107214	WTRMA005719	1.42	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
107292	WTRMA005737	30.20	AC	400	1975		0	0	Commercial	13	8	3	0	24
109014	WTRMA005739	92.77	AC	150	1982		0	0	Industrial	7	6	3	0	16
109336	WTRMA005743	11.20	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
109353	WTRMA005744	41.00	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
109953	WTRMA004454	43.24	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
109967	WTRMA005748	8.79	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
110227	WTRMA005749	5.06	PVC	400	2006		0	0	Institutional	15	0	1	0	16
110242	WTRMA005750	1.21	AC	200	1978		0	0	Institutional	10	6	3	0	19
110522	WTRMA005751	2.38	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
110600	WTRMA005755	104.01	PVC	250	2009		0	0	Industrial	7	0	1	0	8
110652	WTRMA005761	35.78	PVC	250	2009		0	0	Industrial	7	0	1	0	8
110662	WTRMA005762	3.20	PVC	250	2009		0	0	Industrial	7	0	1	0	8
110732	WTRMA005767	75.44	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
110740	WTRMA005768	12.70	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
110748	WTRMA005769	15.79	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
110756	WTRMA005770	14.44	PVC	250	2010		0	0	SF - Residential	1	0	1	0	2
110764	WTRMA005771	6.39	PVC	250	2010		0	0	SF - Residential	1	0	1	0	2
110772	WTRMA005772	10.59	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
110780	WTRMA005773	6.38	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
110875	WTRMA005777	11.96	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
110923	WTRMA005783	5.96	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
110963	WTRMA005788	17.52	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
110971	WTRMA005789	11.98	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111059	WTRMA005800	6.57	PVC	50	2010		0	0	SF - Residential	1	0	1	0	2
111067	WTRMA005801	1.50	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111177	WTRMA005805	11.72	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111201	WTRMA005808	9.30	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111209	WTRMA005809	14.10	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111233	WTRMA005812	9.00	PVC	150	2010		0	0	SF - Residential	1	0	1	0	2
111241	WTRMA005813	6.00	PVC	150	2010		0	0	SF - Residential	1	0	1	0	2
111251	WTRMA005814	6.05	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111259	WTRMA005815	2.94	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111275	WTRMA005817	21.01	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111283	WTRMA005818	35.24	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111379	WTRMA005830	110.22	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111387	WTRMA005831	12.23	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111395	WTRMA005832	19.78	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111539	WTRMA005835	7.83	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
111698	WTRMA005844	8.86	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
111714	WTRMA005846	6.13	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
111724	WTRMA005847	43.60	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
111752	WTRMA005850	5.99	PVC	150	2010		0	0	SF - Residential	1	0	1	0	2

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
111760	WTRMA005851	8.82	PVC	150	2010		0	0	SF - Residential	1	0	1	0	2
115665	WTRMA005435	3.39	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115700	WTRMA004472	8.69	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
115701	WTRMA004472	5.66	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
115736	WTRMA005435	0.15	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115743	WTRMA005435	1.77	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115744	WTRMA005435	8.30	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115751	WTRMA005435	1.57	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115759	WTRMA005435	17.40	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115767	WTRMA005435	27.00	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115778	WTRMA005433	8.03	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115786	WTRMA005433	3.91	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115794	WTRMA005433	12.47	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115802	WTRMA005433	12.10	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115809	WTRMA005433	12.34	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115810	WTRMA005433	4.09	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115842	WTRMA004484	0.30	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
115857	WTRMA004484	0.03	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
115995	WTRMA005435	27.04	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
115996	WTRMA005435	23.65	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116090	WTRMA004692	1.97	PVC	400	2008		0	0	SF - Residential	6	0	1	0	7
116091	WTRMA004692	0.47	PVC	400	2008		0	0	SF - Residential	6	0	1	0	7
116126	WTRMA005794	3.65	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
116135	WTRMA005795	20.42	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
116143	WTRMA005795	6.52	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
116150	WTRMA005431	1.17	PVC	400	2008		0	0	SF - Residential	6	0	1	0	7
116271	WTRMA005431	2.15	PVC	400	2008		0	0	SF - Residential	6	0	1	0	7
116272	WTRMA005431	0.02	PVC	400	2008		0	0	SF - Residential	6	0	1	0	7
116326	WTRMA005792	6.97	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116333	WTRMA005790	4.98	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116334	WTRMA005790	31.06	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116350	WTRMA005782	19.50	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116358	WTRMA005782	18.49	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116365	WTRMA005782	25.09	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116366	WTRMA005782	32.07	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116373	WTRMA005776	8.92	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116391	WTRMA005776	18.74	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116399	WTRMA005776	11.62	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116407	WTRMA005776	3.36	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116415	WTRMA005778	3.04	PVC	150	2010		0	0	SF - Residential	1	0	1	0	2
116416	WTRMA005778	3.10	PVC	150	2010		0	0	SF - Residential	1	0	1	0	2
116424	WTRMA005781	22.62	PVC	150	2010		0	0	SF - Residential	1	0	1	0	2
116441	WTRMA005781	3.72	PVC	150	2010		0	0	SF - Residential	1	0	1	0	2
116442	WTRMA005781	2.74	PVC	150	2010		0	0	SF - Residential	1	0	1	0	2
116449	WTRMA005784	6.21	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116450	WTRMA005784	2.30	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116457	WTRMA005787	4.46	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
116468	WTRMA005425	8.58	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116476	WTRMA005425	25.08	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116483	WTRMA005425	9.77	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116484	WTRMA005425	2.76	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116492	WTRMA005424	5.61	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116499	WTRMA005424	2.63	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116500	WTRMA005424	6.02	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116517	WTRMA005430	12.57	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116518	WTRMA005430	30.81	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116525	WTRMA004463	6.12	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116526	WTRMA004463	8.39	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116533	WTRMA004469	18.51	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116534	WTRMA004469	4.62	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116541	WTRMA004476	6.73	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116549	WTRMA004476	4.00	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116557	WTRMA004476	27.46	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116565	WTRMA004476	1.74	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116573	WTRMA004476	30.45	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116594	WTRMA004476	2.53	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116601	WTRMA004473	10.52	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116609	WTRMA004473	25.51	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116635	WTRMA004473	29.31	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116636	WTRMA004473	0.94	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116643	WTRMA004473	30.45	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116652	WTRMA004462	35.81	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116659	WTRMA004473	22.74	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116667	WTRMA004473	0.54	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116681	WTRMA005426	1.77	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116689	WTRMA005426	0.33	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116697	WTRMA005426	0.75	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116705	WTRMA005426	22.44	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116713	WTRMA005426	31.48	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116721	WTRMA005426	31.71	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116722	WTRMA005426	37.66	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
116731	WTRMA004466	4.62	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
116732	WTRMA004466	17.49	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
117258	WTRMA005776	7.31	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117259	WTRMA005776	1.97	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117386	WTRMA004457	14.70	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
117393	WTRMA004457	20.80	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
117394	WTRMA004457	0.28	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
117437	WTRMA004446	16.93	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
117445	WTRMA004446	6.14	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
117446	WTRMA004446	3.63	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
117453	WTRMA004449	8.80	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
117454	WTRMA004449	3.58	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
117461	WTRMA004450	14.67	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
117469	WTRMA004450	1.61	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
117477	WTRMA004450	29.19	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
117485	WTRMA004450	1.81	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
117493	WTRMA004450	27.00	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
117501	WTRMA004450	3.47	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
117502	WTRMA004450	1.68	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
117510	WTRMA005816	1.32	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117518	WTRMA005816	3.42	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117534	WTRMA005816	23.90	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117541	WTRMA005816	3.01	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117542	WTRMA005816	22.45	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117550	WTRMA005802	1.34	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117558	WTRMA005802	1.88	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117582	WTRMA005802	3.95	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117590	WTRMA005802	2.69	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117607	WTRMA005804	8.34	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117608	WTRMA005804	3.26	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117616	WTRMA005806	9.35	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117624	WTRMA005806	4.55	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117632	WTRMA005806	21.36	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117648	WTRMA005807	12.80	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117656	WTRMA005807	1.00	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117664	WTRMA005807	9.09	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117672	WTRMA005807	0.50	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
117938	WTRMA005807	0.02	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
118485	WTRMA003786	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
118522	WTRMA003782	4.04	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118537	WTRMA003782	0.05	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118538	WTRMA003782	0.54	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118549	WTRMA003782	21.10	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118550	WTRMA003782	1.62	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118582	WTRMA003781	6.08	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
118612	WTRMA003781	20.01	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
118623	WTRMA003781	16.74	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
118635	WTRMA003781	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
118665	WTRMA003374	19.08	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
118701	WTRMA003692	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
118702	WTRMA003692	17.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
118794	WTRMA003581	2.34	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118805	WTRMA003581	0.40	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118817	WTRMA003581	1.26	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118818	WTRMA003581	2.47	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118829	WTRMA003581	24.10	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118843	WTRMA003581	0.35	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118844	WTRMA003581	0.50	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118855	WTRMA003581	0.66	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118856	WTRMA003581	5.19	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118900	WTRMA003587	1.01	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118929	WTRMA003587	2.26	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118941	WTRMA003587	1.64	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118942	WTRMA003587	1.25	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118954	WTRMA003587	0.61	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118966	WTRMA003587	0.50	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
118990	WTRMA003586	2.81	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
119014	WTRMA000792	2.99	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
119025	WTRMA003814	6.24	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119050	WTRMA003814	0.68	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119095	WTRMA003814	0.67	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119119	WTRMA003817	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119143	WTRMA003817	18.27	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119144	WTRMA003817	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119156	WTRMA003817	4.40	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119167	WTRMA003817	26.58	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119168	WTRMA003817	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119191	WTRMA003817	28.32	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119192	WTRMA003817	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119204	WTRMA003817	1.33	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119216	WTRMA003817	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119247	WTRMA003583	1.55	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
119248	WTRMA003583	27.15	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
119283	WTRMA003696	0.59	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
119284	WTRMA003696	1.07	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
119307	WTRMA003696	1.16	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
119308	WTRMA003696	0.83	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
119320	WTRMA003695	8.71	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
119332	WTRMA003695	0.50	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
119344	WTRMA003695	20.06	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
119356	WTRMA003695	2.89	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
119397	WTRMA003779	3.65	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
119434	WTRMA003781	18.85	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
119451	WTRMA003374	0.15	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
119452	WTRMA003374	10.30	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
119464	WTRMA003820	1.69	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119475	WTRMA003820	1.89	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119476	WTRMA003820	24.17	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119488	WTRMA003817	0.18	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
119555	WTRMA003786	2.86	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
119556	WTRMA003786	1.54	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
119780	WTRMA000746	22.18	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
119781	WTRMA000746	12.25	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
119821	WTRMA000728	0.50	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
119839	WTRMA000728	0.23	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
119850	WTRMA000725	14.73	PVC	250	2001		0	0	SF - Residential	1	2	1	10	14
119851	WTRMA000725	0.27	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
119863	WTRMA000728	2.42	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
119880	WTRMA000728	12.72	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
119892	WTRMA000728	0.50	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
119893	WTRMA000728	5.92	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
119911	WTRMA000728	0.48	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
119922	WTRMA000774	21.60	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
119940	WTRMA004724	33.54	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
119956	WTRMA004724	1.33	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
119957	WTRMA004724	12.41	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
119972	WTRMA004725	8.63	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
120004	WTRMA004725	13.06	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
120020	WTRMA004725	15.48	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
120264	WTRMA000732	1.46	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
120486	WTRMA000764	0.50	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
120487	WTRMA000764	9.93	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
120498	WTRMA000764	32.83	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
120499	WTRMA000764	0.50	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
120511	WTRMA000764	28.99	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
120522	WTRMA000764	5.98	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
120523	WTRMA000764	0.50	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
120613	WTRMA000773	0.50	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
120624	WTRMA000773	0.50	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
120625	WTRMA000773	10.23	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
120665	WTRMA000773	19.81	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
120677	WTRMA000773	0.50	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
120689	WTRMA000773	20.71	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
120731	WTRMA000780	3.03	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
120743	WTRMA000780	0.58	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
120796	WTRMA003838	0.50	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
120820	WTRMA003844	0.52	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
120833	WTRMA003844	20.05	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
120845	WTRMA005746	3.62	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
120856	WTRMA005746	1.38	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
120857	WTRMA005746	0.31	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
120874	WTRMA003844	43.39	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
120875	WTRMA003844	6.78	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
120899	WTRMA003842	0.60	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
120922	WTRMA003842	6.42	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
120946	WTRMA003842	17.78	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
120958	WTRMA003842	2.75	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
120982	WTRMA003842	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
120983	WTRMA003842	2.75	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
121120	WTRMA000825	0.38	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121121	WTRMA000825	0.11	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121132	WTRMA000825	21.48	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121133	WTRMA000825	1.26	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121172	WTRMA000830	1.06	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121173	WTRMA000830	1.90	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121196	WTRMA000830	23.84	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121197	WTRMA000830	4.55	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121220	WTRMA000830	1.91	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121221	WTRMA000830	0.18	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121236	WTRMA000830	0.82	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121322	WTRMA000810	1.72	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
121334	WTRMA000815	0.57	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
121359	WTRMA000815	5.71	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
121370	WTRMA000817	26.03	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
121383	WTRMA000818	4.56	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121395	WTRMA000818	0.40	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121406	WTRMA000817	4.65	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
121407	WTRMA000817	6.98	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
121419	WTRMA000818	0.88	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121431	WTRMA000818	30.18	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121443	WTRMA000818	0.40	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121455	WTRMA000818	2.60	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121472	WTRMA000821	24.02	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121484	WTRMA000818	15.73	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121496	WTRMA000818	0.40	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121508	WTRMA000821	0.40	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121509	WTRMA000821	15.86	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
121554	WTRMA000815	0.80	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
121555	WTRMA000815	1.26	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
121606	WTRMA004493	5.81	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
121607	WTRMA004493	0.50	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
121618	WTRMA004493	13.67	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
121630	WTRMA004493	0.50	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
121642	WTRMA004493	24.55	PVC	250	2007		0	0	Institutional	10	0	1	0	11
121654	WTRMA004493	0.50	PVC	250	2007		0	0	Institutional	10	0	1	0	11
121666	WTRMA004493	8.55	PVC	250	2007		0	0	Institutional	10	0	1	0	11
121667	WTRMA004493	3.85	PVC	250	2007		0	0	Institutional	10	0	1	0	11
121679	WTRMA004490	7.85	PVC	250	2007		0	0	Institutional	10	0	1	0	11
121691	WTRMA004490	2.61	PVC	250	2007		0	0	Institutional	10	0	1	0	11
121771	WTRMA004723	33.02	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
121798	WTRMA000872	28.16	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
121810	WTRMA000872	0.50	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
121833	WTRMA000872	0.50	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
121834	WTRMA000872	30.49	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
121845	WTRMA000872	15.96	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
121857	WTRMA000872	0.50	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
121858	WTRMA000872	3.00	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
121881	WTRMA000875	34.86	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
121882	WTRMA000875	0.50	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
121893	WTRMA000875	4.47	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
121905	WTRMA000875	0.51	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
121906	WTRMA000875	15.59	PVC	200	2000		0	0	SF - Residential	1	2	1	0	4
121917	WTRMA000879	6.34	PVC	150	2000		0	0	SF - Residential	1	2	1	0	4
121936	WTRMA000879	2.57	PVC	150	2000		0	0	SF - Residential	1	2	1	0	4
121948	WTRMA000879	0.72	PVC	150	2000		0	0	SF - Residential	1	2	1	0	4
122047	WTRMA003830	3.75	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
122053	WTRMA003830	38.49	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
122060	WTRMA003830	0.50	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
122061	WTRMA003830	20.95	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
122082	WTRMA005432	1.63	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
122083	WTRMA005432	20.60	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
122088	WTRMA005432	16.55	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2
122089	WTRMA005432	2.28	PVC	200	2008		0	0	SF - Residential	1	0	1	0	2

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
122094	WTRMA004488	4.11	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
122095	WTRMA004488	1.68	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
122138	WTRMA005802	4.97	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
122146	WTRMA004446	22.54	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
122151	WTRMA004446	44.95	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
122152	WTRMA004446	4.26	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
122169	WTRMA004444	30.76	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
122192	WTRMA004444	27.99	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
122193	WTRMA004444	30.99	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
122205	WTRMA005431	29.96	PVC	400	2008		0	0	SF - Residential	6	0	1	0	7
122206	WTRMA005431	27.80	PVC	400	2008		0	0	SF - Residential	6	0	1	0	7
122218	WTRMA005431	26.44	PVC	400	2008		0	0	SF - Residential	6	0	1	0	7
122230	WTRMA005431	14.14	PVC	400	2008		0	0	SF - Residential	6	0	1	0	7
122231	WTRMA005431	0.33	PVC	400	2008		0	0	SF - Residential	6	0	1	0	7
122237	WTRMA005781	0.29	PVC	150	2010		0	0	SF - Residential	1	0	1	0	2
122238	WTRMA005781	0.27	PVC	150	2010		0	0	SF - Residential	1	0	1	0	2
122381	WTRMA005776	10.41	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
122382	WTRMA005776	23.52	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
122412	WTRMA005787	13.87	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
122413	WTRMA005787	7.55	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
123174	WTRMA001970	5.47	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
123399	WTRMA001974	9.12	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
123506	WTRMA001940	5.12	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
123520	WTRMA001939	1.11	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
123564	WTRMA001902	10.75	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
124506	WTRMA001880	0.59	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
124507	WTRMA001880	15.96	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
124638	WTRMA001888	23.08	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
124678	WTRMA001914	13.73	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
124701	WTRMA001914	30.31	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
124702	WTRMA001914	1.48	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
124724	WTRMA001896	29.68	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
124746	WTRMA001897	1.06	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
124800	WTRMA001942	1.92	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
124823	WTRMA001946	4.38	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
124890	WTRMA001957	10.11	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
124913	WTRMA001953	2.77	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
124914	WTRMA001953	3.15	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
124950	WTRMA001946	18.32	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
124951	WTRMA001946	11.26	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
125004	WTRMA001942	1.48	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
125100	WTRMA001916	4.89	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
125251	WTRMA001937	11.17	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125274	WTRMA001937	4.03	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125297	WTRMA001937	17.94	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125370	WTRMA001932	5.59	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125392	WTRMA001932	20.36	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125393	WTRMA001932	3.06	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125443	WTRMA001931	1.24	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125465	WTRMA001931	14.21	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125529	WTRMA001930	9.76	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125530	WTRMA001930	3.90	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125552	WTRMA001927	7.33	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125553	WTRMA001927	20.64	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125580	WTRMA001926	7.96	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
125841	WTRMA001919	6.20	PVC	400	2002		0	0	SF - Residential	1	2	1	0	4
125849	WTRMA001809	9.60	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
125671	WTRMA001809	3.91	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
125672	WTRMA001809	2.13	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
125694	WTRMA001924	16.24	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
125695	WTRMA001924	1.84	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
125725	WTRMA001921	0.94	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
125841	WTRMA001919	6.20	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
125863	WTRMA001919	4.94	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
125864	WTRMA001919	19.21	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
125885	WTRMA001916	3.72	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
125886	WTRMA001916	3.56	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
125929	WTRMA001916	8.65	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
125968	WTRMA001888	15.10	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126017	WTRMA001888	4.03	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126018	WTRMA001888	4.31	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126089	WTRMA001909	30.00	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126115	WTRMA001909	14.99	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126138	WTRMA001910	14.00	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126191	WTRMA001910	27.99	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126242	WTRMA003814	0.41	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
126243	WTRMA003814	2.79	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
126319	WTRMA003836	0.51	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
126364	WTRMA006551	5.00	PVC	150	1989		0	0	Industrial	7	4	1	0	12
126400	WTRMA001911	6.78	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126401	WTRMA001911	3.85	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126427	WTRMA001896	4.21	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126428	WTRMA001896	0.82	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126450	WTRMA001916	25.66	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
126530	WTRMA001939	5.86	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126553	WTRMA001905	4.31	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126554	WTRMA001905	19.07	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126603	WTRMA001902	4.84	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126627	WTRMA001902	0.44	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126652	WTRMA001902	21.82	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126677	WTRMA001878	19.33	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
126701	WTRMA001868	35.14	PVC	300	2002		0	0	Institutional	10	2	1	0	13
126747	WTRMA001868	24.92	PVC	300	2002		0	0	Institutional	10	2	1	0	13
126798	WTRMA001868	20.87	PVC	300	2002		0	0	Institutional	10	2	1	0	13
126822	WTRMA001865	8.42	PVC	300	2002		0	0	Institutional	10	2	1	0	13
126868	WTRMA001865	29.91	PVC	300	2002		0	0	Institutional	10	2	1	0	13
126922	WTRMA001865	24.35	PVC	300	2002		0	0	Institutional	10	2	1	0	13
126968	WTRMA001865	24.09	PVC	300	2002		0	0	Institutional	10	2	1	0	13

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
127013	WTRMA001865	4.13	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
127037	WTRMA001872	11.54	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
127053	WTRMA004473	1.45	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127059	WTRMA004473	0.38	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127064	WTRMA004473	1.74	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127065	WTRMA004473	0.53	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127070	WTRMA004476	1.44	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127071	WTRMA004476	0.81	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127076	WTRMA004476	11.73	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127077	WTRMA004476	4.28	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127107	WTRMA001969	2.80	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
127108	WTRMA001969	26.04	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
127133	WTRMA001919	24.77	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
127159	WTRMA001871	6.35	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
127226	WTRMA001957	1.46	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
127227	WTRMA001957	23.92	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
127233	WTRMA001970	30.54	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
127234	WTRMA001970	1.13	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
127246	WTRMA005802	18.79	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
127257	WTRMA001946	0.44	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
127313	WTRMA001870	28.60	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
127362	WTRMA004566	27.47	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127416	WTRMA004566	1.95	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127448	WTRMA004562	10.72	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127549	WTRMA004562	23.70	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127550	WTRMA004562	2.72	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127601	WTRMA004559	23.76	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127734	WTRMA004553	7.39	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
127826	WTRMA004543	1.94	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
127871	WTRMA005512	1.11	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
127893	WTRMA005512	2.88	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
127894	WTRMA005512	20.24	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
127954	WTRMA004535	3.04	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
128074	WTRMA004525	25.19	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128118	WTRMA004537	7.55	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
128119	WTRMA004537	24.82	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
128140	WTRMA005513	3.14	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128141	WTRMA005513	13.01	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128165	WTRMA004515	0.58	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128209	WTRMA004515	24.09	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128232	WTRMA004519	14.60	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128308	WTRMA003736	21.91	PVC	250	2007		0	0	Industrial	7	0	1	0	8
128330	WTRMA004852	126.55	CI	150	1950		1	6	SF - Residential	1	12	10	0	29
128331	WTRMA004852	19.96	CI	150	1950		0	0	SF - Residential	1	12	10	0	23
128355	WTRMA000633	132.80	CI	150	1947		1	6	Commercial	8	12	10	0	36
128368	WTRMA000633	0.51	CI	150	1947		0	0	Commercial	8	12	10	0	30
128369	WTRMA000633	15.02	CI	150	1947		0	0	Commercial	8	12	10	0	30
128400	WTRMA004506	3.94	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128446	WTRMA004499	8.76	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128460	WTRMA004499	2.94	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128484	WTRMA004504	7.12	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128529	WTRMA005845	7.15	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
128530	WTRMA005845	3.99	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
128553	WTRMA005843	15.78	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
128576	WTRMA003616	8.60	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
128599	WTRMA001279	5.11	PVC	200	2005		0	0	Multifamily	5	2	1	0	8
128621	WTRMA001279	14.49	PVC	200	2005		0	0	Multifamily	5	2	1	0	8
128622	WTRMA001279	23.06	PVC	200	2005		0	0	Multifamily	5	2	1	0	8
128645	WTRMA005486	2.99	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128660	WTRMA005511	0.88	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128661	WTRMA005511	2.39	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128681	WTRMA004562	9.56	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128702	WTRMA004566	23.26	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128703	WTRMA004566	6.12	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128760	WTRMA004562	29.80	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
128947	WTRMA005486	11.14	PVC	200	2007		0	0	Multifamily	5	0	1	0	6
128968	WTRMA001277	16.95	PVC	200	2005		0	0	Multifamily	5	2	1	5	13
128969	WTRMA001277	14.20	PVC	200	2005		0	0	Multifamily	5	2	1	0	8
128991	WTRMA005478	4.94	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
129049	WTRMA005474	21.05	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
129085	WTRMA005472	5.71	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
129134	WTRMA005472	8.07	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
129191	WTRMA005477	5.98	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
129237	WTRMA001234	11.22	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
129257	WTRMA005477	23.53	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
129258	WTRMA005477	8.06	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
129293	WTRMA005477	27.69	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
129294	WTRMA005477	3.37	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
129327	WTRMA005474	27.51	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
129328	WTRMA005474	3.76	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
129350	WTRMA005474	10.78	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
129351	WTRMA005474	18.54	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
129404	WTRMA005480	4.52	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
129405	WTRMA005480	4.24	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
129420	WTRMA006678	65.52	AC		1977		0	0	N/A	0	0	0	0	0
129429	WTRMA006679	44.18	AC		1977		0	0	N/A	0	0	0	0	0
129438	WTRMA006680	44.19	AC		1977		0	0	N/A	0	0	0	0	0
129447	WTRMA006681	44.19	AC		1977		0	0	N/A	0	0	0	0	0
129456	WTRMA006682	65.52	AC		1977		0	0	N/A	0	0	0	0	0
129461	WTRMA006683	65.52	AC		1977		0	0	N/A	0	0	0	0	0
129466	WTRMA006684	11.06	AC		1977		0	0	N/A	0	0	0	0	0
129475	WTRMA006685	17.93	AC		1977		0	0	N/A	0	0	0	0	0
129482	WTRMA006686	1.84	AC		1977		0	0	N/A	0	0	0	0	0
129489	WTRMA006687	14.02	CI	100	1947	200	0	0	N/A	0	0	0	0	0
129498	WTRMA006688	6.28	CI	150	1948	1955	0	0	N/A	0	0	0	0	0
129507	WTRMA006689	328.55	AC	250	1976	1979	0	0	N/A	0	0	0	0	0
129516	WTRMA006690	35.47	CI	150	1955	1955	0	0	N/A	0	0	0	0	0
129525	WTRMA006691	18.51	CI		1960	1985	0	0	N/A	0	0	0	0	0

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
129548	WTRMA006692	13.78	TRAN	150	1940	1976	0	0	N/A	0	0	0	0	0
129557	WTRMA006693	16.09	AC	150	1976		0	0	Commerical	8	6	3	0	17
129562	WTRMA000690	47.20	CI	150	1947		0	0	Commerical	8	12	10	0	30
129589	WTRMA004079	180.27	AC	250	1974		0	0	Institutional	10	8	3	0	21
129629	WTRMA005577	1.93	PVC	400	1987		0	0	Commerical	13	4	1	0	18
129630	WTRMA005577	8.50	PVC	400	1987		0	0	Parks, open space and trail	6	4	1	0	11
129677	WTRMA006698	0.55	PVC	300	2010		0	0	Parks, open space and trail	1	0	1	0	2
129682	WTRMA006699	148.52	PVC	300	2010		0	0	Commerical	8	0	1	0	9
129692	WTRMA006701	0.86	PVC	300	2010		0	0	Commerical	8	0	1	0	9
129697	WTRMA006702	3.01	PVC	300	2010		0	0	Commerical	8	0	1	0	9
129702	WTRMA006703	18.88	PVC	150	2010		0	0	Commerical	8	0	1	0	9
129709	WTRMA006704	1.00	PVC	150	2010		0	0	Commerical	8	0	1	0	9
129727	WTRMA006707	1.51	PVC	150	2010		0	0	Commerical	8	0	1	0	9
129739	WTRMA006709	2.75	PVC	150	2010		0	0	Commerical	8	0	1	0	9
129743	WTRMA006708	29.23	PVC	150	2010		0	0	Commerical	8	0	1	0	9
129820	WTRMA005481	25.45	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
129850	WTRMA001931	4.92	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
129851	WTRMA001931	25.82	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
129900	WTRMA002275	14.66	AC	150	1978		0	0	SF - Residential	1	6	3	10	20
129921	WTRMA002275	1.00	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
129922	WTRMA002275	1.27	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
129978	WTRMA001239	2.27	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
130042	WTRMA003652	4.75	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
130043	WTRMA003652	32.06	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
130123	WTRMA001967	10.78	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
130155	WTRMA001910	13.34	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130180	WTRMA001916	22.32	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
130181	WTRMA001916	4.11	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
130204	WTRMA001930	29.42	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130226	WTRMA001930	29.53	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130227	WTRMA001930	8.32	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130249	WTRMA001916	2.40	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
130250	WTRMA001916	18.42	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
130273	WTRMA001939	12.60	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130295	WTRMA001902	7.57	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130296	WTRMA001902	22.45	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130319	WTRMA001868	27.42	PVC	300	2002		0	0	Institutional	10	2	1	0	13
130345	WTRMA001865	23.44	PVC	300	2002		0	0	Institutional	10	2	1	0	13
130383	WTRMA001870	22.58	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
130384	WTRMA001870	4.65	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
130407	WTRMA001870	13.30	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
130446	WTRMA001878	1.04	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130469	WTRMA001880	4.81	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130519	WTRMA001880	32.98	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130542	WTRMA001883	20.70	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130543	WTRMA001883	8.50	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130565	WTRMA004473	1.23	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
130566	WTRMA004473	2.43	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
130573	WTRMA005430	20.42	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
130574	WTRMA005430	1.84	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
130579	WTRMA004462	31.15	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
130580	WTRMA004462	31.74	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
130585	WTRMA003833	21.63	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130591	WTRMA003833	0.50	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130597	WTRMA003833	4.45	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130610	WTRMA003833	24.87	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130611	WTRMA003833	0.50	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130616	WTRMA003833	13.28	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130623	WTRMA003833	0.50	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130630	WTRMA003833	10.95	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130631	WTRMA003833	2.09	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130637	WTRMA003836	2.90	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130644	WTRMA003836	23.79	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130650	WTRMA003836	0.50	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130656	WTRMA003836	3.60	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130662	WTRMA003836	0.50	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130663	WTRMA003836	22.26	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130674	WTRMA003836	16.84	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130675	WTRMA003836	3.55	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
130681	WTRMA003656	1.83	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
130682	WTRMA003656	22.18	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
130693	WTRMA001883	12.15	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130743	WTRMA005514	4.64	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
130771	WTRMA004559	0.43	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
130778	WTRMA004554	0.49	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
130783	WTRMA001967	26.78	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
130789	WTRMA001948	3.98	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
130790	WTRMA001948	3.58	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
130796	WTRMA001948	32.97	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
130803	WTRMA001946	7.67	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
130804	WTRMA001946	29.05	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
130809	WTRMA001942	33.09	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
130817	WTRMA001942	1.65	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
130818	WTRMA001942	29.09	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
130826	WTRMA001970	1.95	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
130832	WTRMA001972	30.88	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
130839	WTRMA001916	5.40	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
130840	WTRMA001916	21.51	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
130845	WTRMA001919	5.22	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
130851	WTRMA001919	27.80	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
130852	WTRMA001919	3.19	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
130858	WTRMA001878	33.65	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130866	WTRMA001870	16.10	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
130871	WTRMA001974	13.32	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130872	WTRMA001974	6.41	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
130884	WTRMA005472	55.59	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
130885	WTRMA005472	21.76	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
130890	WTRMA003647	43.03	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
130891	WTRMA003647	40.34	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
130896	WTRMA003374	6.75	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130897	WTRMA003374	36.20	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130903	WTRMA003789	3.18	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130908	WTRMA003789	7.94	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130909	WTRMA003789	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130914	WTRMA003695	13.14	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
130920	WTRMA003695	15.78	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
130926	WTRMA003695	0.50	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
130932	WTRMA003695	25.40	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
130933	WTRMA003695	0.50	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
130939	WTRMA003695	0.17	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
130946	WTRMA003695	0.50	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
130947	WTRMA003695	2.07	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
130952	WTRMA003692	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130953	WTRMA003692	24.15	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130959	WTRMA003691	15.26	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130965	WTRMA003691	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130971	WTRMA003691	24.29	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130978	WTRMA003691	0.56	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130984	WTRMA003691	43.79	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130992	WTRMA003691	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130993	WTRMA003691	10.88	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130998	WTRMA003582	3.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
130999	WTRMA003582	2.56	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131004	WTRMA003586	2.48	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131010	WTRMA003586	29.68	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131016	WTRMA003586	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131017	WTRMA003586	29.61	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131022	WTRMA003587	5.41	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
131029	WTRMA003587	24.65	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
131036	WTRMA003589	25.03	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131044	WTRMA003589	0.54	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131045	WTRMA003589	15.71	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131050	WTRMA003814	16.02	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
131051	WTRMA003814	8.61	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
131056	WTRMA003817	0.93	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
131062	WTRMA003817	4.02	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
131063	WTRMA003817	28.06	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
131068	WTRMA003786	24.96	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131069	WTRMA003786	4.01	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131074	WTRMA003785	12.53	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131075	WTRMA003785	18.14	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131080	WTRMA003781	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131081	WTRMA003781	17.30	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131086	WTRMA003781	12.62	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131087	WTRMA003781	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
131093	WTRMA003779	7.47	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
131099	WTRMA003779	0.50	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
131105	WTRMA003779	0.66	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
131111	WTRMA003779	1.04	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
131116	WTRMA003779	0.70	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
131117	WTRMA003779	8.28	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
131123	WTRMA000744	3.55	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
131129	WTRMA000744	0.32	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
131135	WTRMA000744	13.16	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
131142	WTRMA000744	0.58	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
131150	WTRMA000744	13.41	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
131156	WTRMA000744	0.58	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
131164	WTRMA000744	13.41	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
131171	WTRMA000744	0.58	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
131177	WTRMA000744	13.41	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
131185	WTRMA000744	3.50	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
131192	WTRMA000744	10.49	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
131199	WTRMA000744	1.35	PVC	250	1986		0	0	Institutional	10	4	1	0	15
131200	WTRMA000744	13.99	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
131205	WTRMA000742	2.78	PVC	250	1986		0	0	Institutional	10	4	1	0	15
131206	WTRMA000742	3.53	PVC	250	1986		0	0	Institutional	10	4	1	0	15
131212	WTRMA000739	11.20	PVC	250	1986		0	0	Institutional	10	4	1	5	20
131218	WTRMA000739	17.00	PVC	250	1986		0	0	Institutional	10	4	1	0	15
131226	WTRMA000810	7.28	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
131232	WTRMA000810	23.49	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
131239	WTRMA000810	0.99	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
131246	WTRMA000810	4.00	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
131253	WTRMA000810	10.50	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
131260	WTRMA000810	4.00	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
131267	WTRMA000810	18.70	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
131274	WTRMA000810	4.63	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
131281	WTRMA000810	1.14	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
131286	WTRMA000810	32.79	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
131287	WTRMA000810	3.25	PVC	200	1995		0	0	SF - Residential	1	4	1	0	6
131292	WTRMA000818	31.59	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
131293	WTRMA000818	0.40	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
131305	WTRMA000886	0.50	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
131311	WTRMA000886	0.50	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
131317	WTRMA000886	0.50	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
131318	WTRMA000886	0.32	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
131323	WTRMA000750	44.80	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131329	WTRMA000750	0.68	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131335	WTRMA000750	16.32	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131342	WTRMA000750	9.36	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131347	WTRMA000753	5.78	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131353	WTRMA000753	3.70	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131359	WTRMA000753	13.30	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131365	WTRMA000753	5.33	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131371	WTRMA000753	12.91	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131377	WTRMA000753	3.93	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
131383	WTRMA000753	12.88	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131384	WTRMA000753	3.91	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131389	WTRMA000754	1.87	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131395	WTRMA000754	13.85	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131403	WTRMA000754	23.98	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131409	WTRMA000754	15.51	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131416	WTRMA000754	16.99	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131437	WTRMA000756	8.02	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131438	WTRMA000756	4.30	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131444	WTRMA000757	12.69	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131451	WTRMA000757	16.99	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131452	WTRMA000757	13.56	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131459	WTRMA000758	25.46	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131465	WTRMA000758	13.02	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131471	WTRMA000758	0.50	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131472	WTRMA000758	7.19	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131477	WTRMA000758	2.54	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131483	WTRMA000758	1.10	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131489	WTRMA000758	1.93	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131490	WTRMA000758	6.00	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
131495	WTRMA003838	14.48	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
131496	WTRMA003838	0.50	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
131534	WTRMA001883	26.15	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
131535	WTRMA001883	3.01	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
131557	WTRMA001506	17.53	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
131558	WTRMA001506	10.14	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
131573	WTRMA001502	16.66	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
131606	WTRMA001502	3.57	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
131677	WTRMA001502	2.21	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
131678	WTRMA001502	42.18	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
131731	WTRMA001497	28.84	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
131762	WTRMA001479	3.08	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
131808	WTRMA001478	4.45	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
131845	WTRMA004673	4.34	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
131846	WTRMA004673	2.48	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
131867	WTRMA001478	2.63	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
131935	WTRMA001474	5.76	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
131959	WTRMA001474	5.90	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
132135	WTRMA001474	2.96	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
132182	WTRMA000914	7.57	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132204	WTRMA000911	2.25	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132044	WTRMA000911	27.75	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132066	WTRMA000914	2.12	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132089	WTRMA000914	27.84	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132112	WTRMA000914	4.00	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132135	WTRMA000914	27.68	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132182	WTRMA000914	7.57	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132204	WTRMA000922	11.78	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132362	WTRMA000922	3.36	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132219	WTRMA000917	26.42	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132292	WTRMA000917	1.20	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132293	WTRMA000917	2.19	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132315	WTRMA000917	1.71	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132316	WTRMA000917	2.40	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132339	WTRMA000922	11.78	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132362	WTRMA000914	46.67	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132384	WTRMA000922	10.26	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132399	WTRMA000922	6.34	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132400	WTRMA000922	13.02	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132450	WTRMA000918	0.63	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132464	WTRMA000914	1.43	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132486	WTRMA000914	0.22	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132487	WTRMA000914	46.67	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132509	WTRMA000914	0.44	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132510	WTRMA000914	3.73	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132594	WTRMA000911	3.77	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132595	WTRMA000911	0.42	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132706	WTRMA000903	5.61	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132725	WTRMA006700	1.00	PVC	300	2010		0	0	Commercial	8	0	1	0	9
132738	WTRMA000903	2.88	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132760	WTRMA000903	22.04	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
132809	WTRMA001520	5.92	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
132855	WTRMA001520	4.06	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
132877	WTRMA001520	19.33	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
133018	WTRMA001511	22.09	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
133041	WTRMA001532	2.71	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133102	WTRMA001533	27.96	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133137	WTRMA001533	3.36	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133159	WTRMA001534	0.76	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133160	WTRMA001534	11.20	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133211	WTRMA001539	13.35	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133280	WTRMA001540	4.19	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133305	WTRMA001540	13.93	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133361	WTRMA001540	24.83	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133385	WTRMA001540	10.22	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133386	WTRMA001540	3.67	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133411	WTRMA001540	10.76	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133433	WTRMA001540	2.36	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133456	WTRMA001540	35.92	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133457	WTRMA001540	1.74	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133479	WTRMA001545	1.79	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
133480	WTRMA001545	1.78	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
133502	WTRMA001543	29.04	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133503	WTRMA001543	7.17	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133525	WTRMA001527	0.37	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133549	WTRMA001527	3.79	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133609	WTRMA001527	3.89	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133633	WTRMA001523	3.68	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
133686	WTRMA001528	3.56	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133709	WTRMA001528	3.78	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133732	WTRMA001528	26.98	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133754	WTRMA001528	6.82	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133755	WTRMA001528	4.16	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133800	WTRMA001529	3.95	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133801	WTRMA001529	12.36	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133823	WTRMA001532	0.29	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133824	WTRMA001532	0.97	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
133847	WTRMA001520	22.65	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
133931	WTRMA001509	28.13	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
133959	WTRMA001509	4.03	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
133960	WTRMA001509	28.83	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
133982	WTRMA001509	7.91	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
133983	WTRMA001509	13.41	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134005	WTRMA001514	23.92	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134028	WTRMA001514	4.10	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134029	WTRMA001514	12.62	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134075	WTRMA001511	7.62	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134076	WTRMA001511	19.12	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134098	WTRMA001511	3.60	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134099	WTRMA001511	29.43	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134136	WTRMA001511	0.99	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134137	WTRMA001511	7.23	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134159	WTRMA001512	8.67	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134160	WTRMA001512	2.84	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134182	WTRMA001502	24.14	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134183	WTRMA001502	13.36	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134205	WTRMA001502	9.99	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134206	WTRMA001502	32.91	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134228	WTRMA001499	1.47	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134229	WTRMA001499	1.09	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134251	WTRMA001497	46.76	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134252	WTRMA001497	1.84	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
134318	WTRMA006873	14.62	CU	19	2003		0	0	SF - Residential	1	2	10	0	13
134319	WTRMA006873	14.67	CU	19	2003		0	0	SF - Residential	1	2	10	0	13
134385	WTRMA001496	0.20	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
134386	WTRMA001496	6.94	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
134424	WTRMA001493	0.77	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
134447	WTRMA001493	1.84	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
134470	WTRMA001493	1.84	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
134493	WTRMA001493	28.52	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
134577	WTRMA001493	6.73	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
134601	WTRMA001459	16.42	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
134623	WTRMA001459	23.84	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
134624	WTRMA001459	0.11	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
134656	WTRMA001472	2.16	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
134678	WTRMA001463	11.11	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
134724	WTRMA001463	3.99	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
134753	WTRMA001472	25.72	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
134798	WTRMA001454	16.61	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
134821	WTRMA001453	7.53	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
134844	WTRMA001453	3.68	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
134845	WTRMA001453	0.45	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
134867	WTRMA001449	8.21	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
134890	WTRMA001449	18.27	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
134915	WTRMA001449	3.86	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
134938	WTRMA001449	22.09	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
134962	WTRMA001449	3.67	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
135033	WTRMA001465	26.09	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
135034	WTRMA001465	3.34	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
135056	WTRMA001454	1.83	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
135057	WTRMA001454	1.83	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
135127	WTRMA001465	6.82	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
135128	WTRMA001465	4.39	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
135166	WTRMA004815	10.56	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
135189	WTRMA004815	3.60	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
135212	WTRMA004815	26.11	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
135234	WTRMA004815	2.43	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
135235	WTRMA004815	3.79	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
135257	WTRMA001460	1.53	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
135280	WTRMA001460	3.91	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
135281	WTRMA001460	32.70	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
135311	WTRMA001466	3.21	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
135356	WTRMA001466	1.86	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
135397	WTRMA001443	23.99	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
135398	WTRMA001443	12.84	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
135420	WTRMA001463	7.90	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
135421	WTRMA001463	20.17	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
135443	WTRMA001463	6.09	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
135444	WTRMA001463	29.84	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
135466	WTRMA003807	31.66	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
135489	WTRMA003807	3.10	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
135513	WTRMA003807	3.32	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
135514	WTRMA003807	3.32	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
135568	WTRMA003808	21.84	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
135608	WTRMA003808	3.88	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
135652	WTRMA003808	0.27	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
135653	WTRMA003808	12.83	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
135692	WTRMA003808	3.79	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
135693	WTRMA003808	26.34	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
135715	WTRMA003808	6.03	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
135716	WTRMA003808	0.21	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
135821	WTRMA004961	4.42	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
135890	WTRMA004961	25.71	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
135891	WTRMA004961	3.43	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
136047	WTRMA000739	11.37	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
136071	WTRMA000739	46.43	PVC	250	1986		0	0	Institutional	10	4	1	0	15

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
136125	WTRMA002493	2.66	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
136245	WTRMA002491	2.15	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
136246	WTRMA002491	6.56	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
136301	WTRMA002491	5.82	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
136302	WTRMA002491	5.82	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
136324	WTRMA002491	8.88	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
136325	WTRMA002491	4.99	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
136356	WTRMA002491	3.53	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
136357	WTRMA002491	9.13	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
136379	WTRMA002490	2.70	PVC	200	1991		0	0	SF - Residential	1	4	1	10	16
136380	WTRMA002490	9.89	PVC	200	1991		0	0	SF - Residential	1	4	1	10	16
136404	WTRMA002489	8.74	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
136405	WTRMA002489	14.37	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
136468	WTRMA002487	15.39	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
136483	WTRMA002487	17.32	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
136523	WTRMA002477	8.43	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
136592	WTRMA002484	8.58	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
136593	WTRMA002484	10.58	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
136615	WTRMA002484	13.59	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
136639	WTRMA002484	11.80	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
136640	WTRMA002484	18.59	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
136715	WTRMA003684	2.47	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
136739	WTRMA003684	3.91	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
136764	WTRMA003684	18.88	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
136765	WTRMA003684	19.94	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
137115	WTRMA003692	2.17	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
137116	WTRMA003692	6.68	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
137317	WTRMA003687	2.00	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
137318	WTRMA003687	15.71	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
137340	WTRMA003687	6.29	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
137341	WTRMA003687	7.83	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
137364	WTRMA003688	7.31	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
137409	WTRMA003659	3.38	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137410	WTRMA003659	16.12	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137455	WTRMA003660	3.97	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137550	WTRMA003660	3.85	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137576	WTRMA003661	4.51	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137577	WTRMA003661	7.48	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137600	WTRMA003688	6.10	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
137637	WTRMA003685	5.32	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
137662	WTRMA003685	18.90	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
137663	WTRMA003685	14.11	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
137687	WTRMA003672	16.99	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137710	WTRMA003673	4.45	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137711	WTRMA003673	1.39	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137757	WTRMA003675	3.90	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137779	WTRMA003675	5.73	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137780	WTRMA003675	8.70	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137802	WTRMA003675	8.93	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137803	WTRMA003675	7.63	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
137828	WTRMA003678	39.91	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
137851	WTRMA003678	3.92	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
137874	WTRMA003678	25.23	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
137896	WTRMA003678	4.10	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
137897	WTRMA003678	13.43	PVC	150	2004		0	0	SF - Residential	1	2	1	0	4
137982	WTRMA003672	10.00	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138005	WTRMA003672	3.89	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138006	WTRMA003672	2.84	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138028	WTRMA003662	20.68	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138051	WTRMA003662	4.15	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138052	WTRMA003662	17.87	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138074	WTRMA003660	4.65	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138075	WTRMA003660	13.43	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138097	WTRMA003660	2.90	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138098	WTRMA003660	22.59	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138122	WTRMA003660	3.24	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138123	WTRMA003660	23.82	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138145	WTRMA003660	2.84	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138146	WTRMA003660	22.89	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138172	WTRMA003659	4.72	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138173	WTRMA003659	7.42	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
138252	WTRMA003842	1.61	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
138253	WTRMA003842	7.17	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
138297	WTRMA003844	3.22	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
138298	WTRMA003844	9.53	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
138340	WTRMA004726	30.08	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
138341	WTRMA004726	8.55	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
138425	WTRMA004725	23.77	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
138449	WTRMA004725	1.50	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
138450	WTRMA004725	2.67	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
138536	WTRMA000779	23.61	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
138537	WTRMA000779	0.31	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
138583	WTRMA004382	3.34	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
138605	WTRMA004382	0.54	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
138606	WTRMA004382	9.64	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
138659	WTRMA000800	24.24	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
138682	WTRMA000800	1.27	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
138683	WTRMA000800	1.27	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
138706	WTRMA000800	0.17	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
138707	WTRMA000800	46.53	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
138748	WTRMA000794	12.98	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
138772	WTRMA000794	3.63	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
138796	WTRMA000794	9.15	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
138824	WTRMA000792	20.75	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
138847	WTRMA000792	11.85	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
138848	WTRMA000792	3.87	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
138870	WTRMA000789	33.89	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
138893	WTRMA000789	8.02	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
138939	WTRMA000789	0.50	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
138980	WTRMA000795	24.28	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
138989	WTRMA000795	0.33	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
138990	WTRMA000795	6.49	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139037	WTRMA000791	2.86	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139074	WTRMA000791	0.71	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139097	WTRMA000791	0.63	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139098	WTRMA000791	1.52	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139120	WTRMA000791	6.78	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139143	WTRMA000791	0.60	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139144	WTRMA000791	19.50	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139167	WTRMA000789	3.42	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139190	WTRMA000789	26.73	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139212	WTRMA000789	25.82	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139213	WTRMA000789	4.00	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139236	WTRMA000789	1.40	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139261	WTRMA000789	3.60	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139284	WTRMA000789	24.60	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139326	WTRMA000794	12.79	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139327	WTRMA000794	10.42	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
139350	WTRMA000739	1.33	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
139351	WTRMA000739	29.46	PVC	250	1986		0	0	SF - Residential	1	4	1	0	6
139535	WTRMA000750	1.84	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
139612	WTRMA000737	41.68	PVC	200	1986		0	0	Institutional	10	4	1	0	15
139674	WTRMA000754	3.60	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
139675	WTRMA000754	3.60	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
139725	WTRMA003838	4.98	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
139726	WTRMA003838	9.61	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
139785	WTRMA000783	22.52	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
139786	WTRMA000783	4.06	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
139809	WTRMA000780	3.71	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
139810	WTRMA000780	14.74	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
139857	WTRMA000773	7.80	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
139858	WTRMA000773	4.73	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
140010	WTRMA000773	8.82	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
140011	WTRMA000773	0.50	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
140032	WTRMA000773	3.35	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
140033	WTRMA000773	17.96	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
140115	WTRMA000776	1.61	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
140116	WTRMA000776	11.90	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
140191	WTRMA000763	4.01	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
140192	WTRMA000763	4.01	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
140207	WTRMA005030	3.93	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
140229	WTRMA005030	4.74	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
140230	WTRMA005030	3.91	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
140253	WTRMA005029	22.73	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
140296	WTRMA000765	13.76	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
140318	WTRMA002461	10.27	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
140374	WTRMA002461	3.93	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
140416	WTRMA002461	39.20	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
140479	WTRMA002456	58.74	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
140502	WTRMA002456	20.50	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
140539	WTRMA002659	1.38	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
140562	WTRMA002659	3.22	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
140585	WTRMA002659	15.34	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
140631	WTRMA002659	12.94	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
140655	WTRMA002659	9.75	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
140656	WTRMA002659	0.28	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
140679	WTRMA002660	4.71	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
140702	WTRMA002660	13.70	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
140725	WTRMA002660	16.00	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
140747	WTRMA002660	3.39	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
140748	WTRMA002660	15.30	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
140771	WTRMA002656	6.91	PVC	400	1989		0	0	SF - Residential	6	4	1	0	11
140834	WTRMA002643	1.23	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
140876	WTRMA002643	4.95	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
140915	WTRMA002617	7.28	PVC	150	1989		0	0	SF - Residential	1	4	1	10	16
141016	WTRMA002611	13.58	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
141040	WTRMA002612	1.78	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141062	WTRMA002612	8.09	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141063	WTRMA002612	15.85	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141085	WTRMA002616	5.76	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141110	WTRMA002617	4.99	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141135	WTRMA002617	15.11	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141158	WTRMA002617	15.11	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141183	WTRMA002617	14.62	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141184	WTRMA002617	0.93	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141222	WTRMA002650	5.25	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141245	WTRMA002650	17.55	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141268	WTRMA002650	14.62	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141291	WTRMA002650	15.11	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141313	WTRMA002650	14.35	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141314	WTRMA002650	15.60	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141369	WTRMA002651	11.91	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141370	WTRMA002651	3.13	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141383	WTRMA002651	14.13	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141406	WTRMA002651	14.62	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141428	WTRMA002651	7.60	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141429	WTRMA002651	14.62	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141452	WTRMA002654	6.55	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141474	WTRMA002654	7.25	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141475	WTRMA002654	15.05	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
141515	WTRMA002656	4.90	PVC	400	1989		0	0	SF - Residential	6	4	1	0	11
141536	WTRMA002656	14.59	PVC	400	1989		0	0	SF - Residential	6	4	1	0	11
141583	WTRMA002639	2.39	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
141651	WTRMA002602	6.29	PVC	250	1985		0	0	SF - Residential	1	6	1	5	13
141698	WTRMA002619	8.47	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
141797	WTRMA002597	6.59	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
141843	WTRMA002589	4.28	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
141865	WTRMA002369	2.07	AC	400	1980		0	0	Institutional	15	6	3	0	24
141889	WTRMA002369	1.94	AC	400	1980		0	0	Institutional	15	6	3	0	24
141934	WTRMA002609	5.69	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
141958	WTRMA002609	13.50	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
141997	WTRMA002277	0.80	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
141998	WTRMA002277	4.37	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
142033	WTRMA002277	58.05	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
142075	WTRMA002277	22.48	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
142097	WTRMA002277	5.96	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
142098	WTRMA002277	0.95	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
142134	WTRMA002282	7.92	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
142156	WTRMA002282	15.93	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
142157	WTRMA002282	22.38	AC	150	1978		0	0	SF - Residential	1	6	3	0	10
142205	WTRMA002036	2.21	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142296	WTRMA005509	2.38	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142297	WTRMA005509	2.38	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142358	WTRMA005509	3.50	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142380	WTRMA005509	9.74	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142381	WTRMA005509	3.66	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142396	WTRMA005509	11.78	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142411	WTRMA005509	16.97	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142449	WTRMA005509	11.46	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142450	WTRMA005509	12.90	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142473	WTRMA002036	6.53	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142495	WTRMA002036	9.08	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142496	WTRMA002036	3.93	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142519	WTRMA002036	3.45	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142541	WTRMA002036	18.56	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142542	WTRMA002036	4.17	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142564	WTRMA002036	15.22	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142565	WTRMA002036	7.54	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142588	WTRMA001764	15.90	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
142618	WTRMA001726	3.91	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
142692	WTRMA003688	1.72	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
142715	WTRMA003688	12.22	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
142716	WTRMA003688	3.94	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
142768	WTRMA003660	3.02	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
142769	WTRMA003660	1.09	PVC	250	2004		0	0	SF - Residential	1	2	1	0	4
142834	WTRMA000770	7.91	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142835	WTRMA000770	31.65	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
142872	WTRMA005029	8.67	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
142895	WTRMA005029	3.73	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
142896	WTRMA005029	0.43	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
142998	WTRMA007201	6.93	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
143010	WTRMA007202	12.01	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
143016	WTRMA007202	8.57	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
143017	WTRMA007202	33.33	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
143034	WTRMA007200	8.98	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
143078	WTRMA001752	6.13	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143101	WTRMA001749	12.43	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143123	WTRMA001746	2.25	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143147	WTRMA001720	17.21	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143169	WTRMA001734	6.90	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143170	WTRMA001734	5.45	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143224	WTRMA004950	2.93	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
143225	WTRMA004950	6.55	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
143247	WTRMA000287	66.39	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
143248	WTRMA000287	45.26	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
143271	WTRMA001740	5.46	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143342	WTRMA001762	4.31	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143364	WTRMA001762	2.91	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143365	WTRMA001762	31.16	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143434	WTRMA001754	16.97	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143449	WTRMA001699	17.95	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
143473	WTRMA001701	13.24	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
143502	WTRMA001701	36.53	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
143540	WTRMA001782	59.41	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
143562	WTRMA001782	25.78	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
143563	WTRMA001782	33.72	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
143594	WTRMA001772	30.05	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143616	WTRMA001772	41.25	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143617	WTRMA001772	32.09	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143639	WTRMA001746	8.74	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143640	WTRMA001746	10.29	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143662	WTRMA001735	31.98	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143663	WTRMA001735	13.72	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143716	WTRMA001688	105.52	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
143717	WTRMA001688	14.84	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
143739	WTRMA001685	0.94	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
143762	WTRMA001687	4.02	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
143785	WTRMA001710	3.13	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143808	WTRMA001710	1.27	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143809	WTRMA001710	73.35	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
143831	WTRMA001784	29.18	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
143879	WTRMA001822	30.04	PVC	300	2001		0	0	SF - Residential	1	2	1	0	4
143880	WTRMA001822	14.71	PVC	300	2001		0	0	SF - Residential	1	2	1	0	4
144062	WTRMA001812	1.42	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
144087	WTRMA001812	1.38	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
144088	WTRMA001812	28.57	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
144125	WTRMA001812	1.41	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
144126	WTRMA001812	28.61	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
144163	WTRMA001812	0.66	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
144164	WTRMA001812	27.46	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
144195	WTRMA001815	1.42	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
144218	WTRMA001817	7.86	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
144327	WTRMA001606	7.60	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144350	WTRMA001603	13.62	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
144374	WTRMA001602	3.27	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144397	WTRMA001606	7.89	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144398	WTRMA001606	7.91	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144421	WTRMA001606	7.58	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144444	WTRMA001606	5.74	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144494	WTRMA001619	18.10	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144516	WTRMA001619	6.32	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144632	WTRMA001619	4.29	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144654	WTRMA001619	18.01	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144716	WTRMA001614	7.25	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144762	WTRMA001614	8.96	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144763	WTRMA001614	7.62	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144787	WTRMA001611	1.65	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144810	WTRMA001611	5.73	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144811	WTRMA001611	7.19	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144833	WTRMA001608	0.92	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144834	WTRMA001608	5.25	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144857	WTRMA001609	2.93	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144905	WTRMA001609	13.86	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144906	WTRMA001609	9.49	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
144973	WTRMA004553	0.15	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
144974	WTRMA004553	4.13	PVC	200	2007		0	0	SF - Residential	1	0	1	10	12
145019	WTRMA004535	1.42	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
145020	WTRMA004535	6.27	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
145043	WTRMA004537	34.32	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
145100	WTRMA004537	12.78	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
145101	WTRMA004537	2.73	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
145121	WTRMA004511	11.43	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145269	WTRMA004520	15.49	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145298	WTRMA004518	0.38	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145299	WTRMA004518	1.69	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145321	WTRMA004515	3.55	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145344	WTRMA004515	5.12	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145445	WTRMA004515	23.27	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145483	WTRMA004520	2.80	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145506	WTRMA004520	0.58	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145529	WTRMA004520	25.16	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145552	WTRMA004520	0.53	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145553	WTRMA004520	12.20	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145575	WTRMA004520	14.58	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145598	WTRMA004521	2.44	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145599	WTRMA004521	12.94	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145632	WTRMA005514	18.69	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145633	WTRMA005514	1.92	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
145677	WTRMA001823	6.73	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
145761	WTRMA004744	29.20	PVC	300	2006		0	0	SF - Residential	1	0	1	0	2
145762	WTRMA004744	14.36	PVC	300	2006		0	0	SF - Residential	1	0	1	0	2
145808	WTRMA004751	13.38	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
145809	WTRMA004751	17.06	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
145857	WTRMA004738	24.74	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
145882	WTRMA004735	4.06	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
145929	WTRMA004735	2.35	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
145974	WTRMA004738	0.95	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
145998	WTRMA004738	13.29	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
146044	WTRMA004749	15.28	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
146138	WTRMA001835	6.33	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
146160	WTRMA001836	11.31	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
146161	WTRMA001836	58.70	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
146183	WTRMA001855	30.74	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
146253	WTRMA001857	1.09	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
146320	WTRMA001856	3.87	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
146448	WTRMA001856	12.21	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
146502	WTRMA001855	28.00	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
146553	WTRMA001832	5.76	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
146598	WTRMA001844	23.88	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
146644	WTRMA001844	20.94	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
146668	WTRMA001848	10.44	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
146693	WTRMA001805	1.22	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
146740	WTRMA002265	15.06	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
146863	WTRMA002262	9.18	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
146901	WTRMA002260	6.12	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
146923	WTRMA002259	8.28	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
146946	WTRMA003167	0.19	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
146947	WTRMA003167	11.11	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
146970	WTRMA002265	7.17	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
147015	WTRMA002265	0.83	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
147086	WTRMA002262	8.67	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
147109	WTRMA002242	5.60	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
147179	WTRMA002252	13.10	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147247	WTRMA002252	5.45	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147248	WTRMA002252	14.42	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147270	WTRMA002255	12.28	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147271	WTRMA002255	8.98	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147294	WTRMA002258	13.92	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147295	WTRMA002258	1.92	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147320	WTRMA002259	0.72	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147346	WTRMA002259	14.42	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147376	WTRMA002259	14.42	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147377	WTRMA002259	14.42	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147399	WTRMA002252	9.81	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147400	WTRMA002252	3.71	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147440	WTRMA002257	6.40	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147462	WTRMA002257	1.38	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147463	WTRMA002257	3.57	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
147480	WTRMA007400	11.16	PVC	300	2011		0	0	Institutional	10	0	1	0	11
147481	WTRMA007401	9.64	PVC	300	1987		0	0	Institutional	10	4	1	0	15
147496	WTRMA000205	9.08	PVC	300	2011		0	0	Institutional	10	0	1	0	11
147500	WTRMA007402	2.53	PVC	300	2011		0	0	Institutional	10	0	1	0	11

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
147517	WTRMA007403	49.72	PVC	250	2011		0	0	Institutional	10	0	1	0	11
147525	WTRMA007404	44.39	PVC	250	2011		0	0	Institutional	10	0	1	0	11
147548	WTRMA007407	90.33	PVC	250	2011		0	0	Institutional	10	0	1	0	11
147562	WTRMA000754	13.40	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
147563	WTRMA000754	3.57	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
148325	WTRMA005811	56.78	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
148326	WTRMA005811	18.99	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
148423	WTRMA003616	0.50	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
148570	WTRMA003728	48.80	PVC	250	2007		0	0	Industrial	7	0	1	0	8
148578	WTRMA007417	0.70	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148583	WTRMA007418	57.99	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148628	WTRMA007427	4.24	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148633	WTRMA007428	2.20	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148658	WTRMA007433	2.05	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148663	WTRMA007434	1.46	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148703	WTRMA007432	2.58	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148715	WTRMA007429	3.12	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148716	WTRMA007429	25.23	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148728	WTRMA007426	19.43	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148729	WTRMA007426	2.87	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148741	WTRMA007423	3.19	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148754	WTRMA007423	49.47	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148755	WTRMA007423	4.30	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148767	WTRMA007422	40.03	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148768	WTRMA007422	2.54	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148780	WTRMA007419	3.24	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148781	WTRMA007419	47.65	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148851	WTRMA007432	1.85	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148852	WTRMA007432	13.35	PVC	250	2011		0	0	Industrial	7	0	1	0	8
148864	WTRMA005791	21.96	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
148865	WTRMA005791	2.14	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
148887	WTRMA005791	1.77	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
148911	WTRMA005791	9.80	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
148933	WTRMA005791	15.77	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
148934	WTRMA005791	0.48	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
148996	WTRMA003616	0.50	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149020	WTRMA003616	0.50	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149042	WTRMA003615	1.86	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149043	WTRMA003615	12.77	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149070	WTRMA005795	1.90	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
149082	WTRMA005795	3.49	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
149115	WTRMA005792	27.90	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
149116	WTRMA005792	46.07	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
149154	WTRMA005793	2.72	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
149176	WTRMA005795	9.92	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
149199	WTRMA005795	3.77	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
149200	WTRMA005795	19.36	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
149251	WTRMA003616	15.15	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149274	WTRMA003612	1.36	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149299	WTRMA003612	0.48	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149362	WTRMA003612	12.92	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149389	WTRMA004484	0.52	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
149425	WTRMA004484	8.89	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
149426	WTRMA004484	20.88	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
149477	WTRMA003612	21.58	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149500	WTRMA004581	3.08	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
149553	WTRMA004570	6.33	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
149595	WTRMA003612	1.94	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149664	WTRMA004193	3.79	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149712	WTRMA004192	1.02	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149775	WTRMA004196	6.78	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149798	WTRMA002817	10.90	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149820	WTRMA002817	22.58	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149876	WTRMA004196	4.02	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149898	WTRMA007492	3.84	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
149916	WTRMA003590	1.74	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
149962	WTRMA004193	4.24	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
150008	WTRMA004193	3.94	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
150031	WTRMA004193	6.85	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
150054	WTRMA004193	8.26	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
150077	WTRMA004193	4.09	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
150099	WTRMA004193	13.65	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
150100	WTRMA004193	6.88	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
150122	WTRMA004193	5.68	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
150145	WTRMA004193	3.80	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
150146	WTRMA004193	12.25	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
150169	WTRMA001264	1.26	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150230	WTRMA001263	4.30	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150346	WTRMA001249	26.64	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150347	WTRMA001249	2.15	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150369	WTRMA001246	2.87	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150370	WTRMA001246	12.03	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150393	WTRMA001244	4.53	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150463	WTRMA001240	4.50	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150530	WTRMA003153	39.71	AC	300	1976		0	0	Commercial	8	6	3	0	17
150531	WTRMA003153	1.45	AC	300	1976		0	0	Commercial	8	6	3	0	17
150536	WTRMA003153	1.46	AC	300	1976		0	0	Commercial	8	6	3	0	17
150537	WTRMA003153	110.87	AC	300	1976		0	0	Commercial	8	6	3	0	17
150559	WTRMA007519	40.09	PVC	500	2004		0	0	Commercial	13	0	1	0	14
150588	WTRMA007520	7.84	PVC	500	2004		0	0	Commercial	13	0	1	0	14
150573	WTRMA007521	6.83	PVC	500	2004		0	0	Commercial	13	0	1	0	14
150578	WTRMA007522	2.20	PVC	300	2004		0	0	Commercial	8	0	1	0	9
150587	WTRMA007523	7.69	PVC	500	2004		0	0	Commercial	13	0	1	0	14
150588	WTRMA007523	20.85	PVC	500	2004		0	0	Commercial	13	0	1	0	14
150594	WTRMA007524	45.43	PVC	500	2004		0	0	Commercial	13	0	1	0	14
150599	WTRMA007525	3.20	PVC	500	2004		0	0	Parks, open spaces and trails	6	0	1	0	7

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
150604	WTRMA007526	0.90	PVC	500			0	0	Parks, open spaces and trails	6	0	1	0	7
150611	WTRMA007527	23.90	PVC	500			0	0	Commercial	13	0	1	0	14
150618	WTRMA007528	43.79	PVC	500			0	0	Commercial	13	0	1	0	14
150632	WTRMA007529	2.20	PVC	500			0	0	Parks, open spaces and trails	6	0	1	0	7
150633	WTRMA007529	0.90	PVC	500			0	0	Parks, open spaces and trails	6	0	1	0	7
150638	WTRMA007530	0.29	PVC	300			0	0	Parks, open spaces and trails	1	0	1	0	2
150645	WTRMA007531	0.43	PVC	300			0	0	Parks, open spaces and trails	1	0	1	0	2
150650	WTRMA007532	1.89	PVC	300			0	0	Parks, open spaces and trails	1	0	1	0	2
150659	WTRMA007533	39.31	PVC	300			0	0	Commercial	8	0	1	0	9
150660	WTRMA007533	16.59	PVC	300			0	0	Commercial	8	0	1	0	9
150671	WTRMA007534	2.38	PVC	300			0	0	Commercial	8	0	1	0	9
150686	WTRMA001240	2.05	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150687	WTRMA001240	28.79	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150732	WTRMA001240	3.16	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150733	WTRMA001240	4.20	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150756	WTRMA001240	18.31	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150779	WTRMA001240	4.10	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
150794	WTRMA007540	1.83	AC	250			0	0	Commercial	8	0	3	0	11
150810	WTRMA007542	1.82	AC	250			0	0	Commercial	8	0	3	0	11
150818	WTRMA007541	0.38	AC	250			0	0	Commercial	8	0	3	0	11
150819	WTRMA007541	4.29	AC	250			0	0	Commercial	8	0	3	0	11
150836	WTRMA003146	2.94	AC	250	1970		0	0	Commercial	8	8	3	0	19
150837	WTRMA003146	0.85	AC	250	1970		0	0	Commercial	8	8	3	0	19
150842	WTRMA007543	7.54	STL	300			0	0	Commercial	8	0	1	0	9
150849	WTRMA007544	1.46	STL	300			0	0	Commercial	8	0	1	0	9
150854	WTRMA007545	1.45	STL	300			0	0	Commercial	8	0	1	0	9
150859	WTRMA007546	6.18	STL	300			0	0	Commercial	8	0	1	0	9
150874	WTRMA004637	6.04	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
150875	WTRMA004637	0.64	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151053	WTRMA004626	4.00	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151076	WTRMA004626	3.90	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151123	WTRMA004621	4.00	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151169	WTRMA004621	4.10	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151311	WTRMA002243	12.70	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
151335	WTRMA002243	13.87	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
151447	WTRMA004639	3.61	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151538	WTRMA004639	23.71	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151594	WTRMA004636	4.09	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151639	WTRMA004636	3.01	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151640	WTRMA004636	3.90	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151687	WTRMA004641	4.00	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151710	WTRMA004641	24.05	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151733	WTRMA004641	4.02	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151755	WTRMA004639	0.94	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151756	WTRMA004639	2.86	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151779	WTRMA004639	1.04	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151780	WTRMA004639	22.32	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151802	WTRMA004639	0.94	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151803	WTRMA004639	2.96	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151825	WTRMA004639	0.74	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151826	WTRMA004639	22.42	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151848	WTRMA004639	8.60	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151849	WTRMA004639	12.90	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151894	WTRMA004616	3.90	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151919	WTRMA004617	5.13	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151942	WTRMA004617	4.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151943	WTRMA004617	4.72	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151965	WTRMA004621	1.39	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151988	WTRMA004621	4.05	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
151989	WTRMA004621	14.43	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152011	WTRMA004621	5.07	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152034	WTRMA004621	3.80	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152035	WTRMA004621	11.01	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152104	WTRMA004621	6.12	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152160	WTRMA004641	14.88	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152161	WTRMA004641	12.00	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152183	WTRMA004621	10.29	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152184	WTRMA004621	3.95	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152206	WTRMA004621	3.42	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152252	WTRMA004626	37.26	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152275	WTRMA004626	2.92	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152276	WTRMA004626	1.08	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152298	WTRMA004626	15.30	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152299	WTRMA004626	4.47	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152338	WTRMA004626	18.32	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152385	WTRMA004629	11.42	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152468	WTRMA004495	2.26	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152491	WTRMA004495	23.60	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152514	WTRMA004495	20.56	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152529	WTRMA004495	3.55	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152530	WTRMA004495	10.42	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152560	WTRMA002283	3.06	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152561	WTRMA002283	11.22	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152584	WTRMA002284	1.56	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152629	WTRMA002284	16.69	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152630	WTRMA002284	3.69	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152652	WTRMA004628	3.98	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152653	WTRMA004628	7.15	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152690	WTRMA004633	1.73	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
152691	WTRMA004633	0.67	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
152752	WTRMA004501	3.98	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
152774	WTRMA004504	4.03	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
152775	WTRMA004504	15.64	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
152820	WTRMA004505	1.01	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
152821	WTRMA004505	8.70	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
152866	WTRMA004506	4.10	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
152867	WTRMA004506	9.11	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
152951	WTRMA003612	3.82	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
152974	WTRMA003612	19.60	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
153050	WTRMA004214	47.40	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
153073	WTRMA003755	23.31	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
153156	WTRMA003596	18.43	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
153157	WTRMA003596	19.53	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
153179	WTRMA003595	4.67	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
153202	WTRMA004494	12.66	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
153203	WTRMA004494	88.38	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
153246	WTRMA004641	3.49	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
153247	WTRMA004641	20.21	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
153270	WTRMA004616	20.05	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
153367	WTRMA002249	13.31	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
153389	WTRMA002249	1.79	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
153390	WTRMA002249	12.20	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
153412	WTRMA002249	3.49	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
153479	WTRMA001084	63.59	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
153480	WTRMA001084	62.32	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
153500	WTRMA001249	1.16	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
153501	WTRMA001249	3.04	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
153560	WTRMA001210	12.67	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153583	WTRMA001210	4.47	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153584	WTRMA001210	13.09	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153632	WTRMA001203	3.79	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
153655	WTRMA001203	12.50	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
153677	WTRMA001203	8.78	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
153701	WTRMA001203	0.86	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
153723	WTRMA001206	12.95	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153792	WTRMA001212	4.70	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153814	WTRMA001212	15.44	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153837	WTRMA001212	4.30	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153838	WTRMA001212	5.51	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153883	WTRMA001212	3.87	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153884	WTRMA001212	8.69	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153907	WTRMA001217	2.41	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153929	WTRMA001217	22.00	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153930	WTRMA001217	4.20	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
153952	WTRMA001191	2.69	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
153998	WTRMA001203	11.15	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154021	WTRMA001203	0.41	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154022	WTRMA001203	23.68	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154114	WTRMA001204	3.80	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154137	WTRMA001204	24.36	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154160	WTRMA001204	2.91	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154161	WTRMA001204	5.95	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154213	WTRMA001198	1.41	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154236	WTRMA001194	0.63	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154260	WTRMA001194	14.21	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154282	WTRMA001194	1.08	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154306	WTRMA001194	20.71	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154328	WTRMA001194	14.79	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154329	WTRMA001194	3.50	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154352	WTRMA001192	0.48	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154369	WTRMA002517	32.42	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
154370	WTRMA002517	12.83	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
154377	WTRMA003327	10.48	AC	200	1984		0	0	Parks, open space, and trails	1	6	3	0	10
154378	WTRMA003327	125.88	AC	200	1984		0	0	Parks, open space, and trails	1	6	3	0	10
154391	WTRMA004217	35.86	AC	200	1978		0	0	Commercial	8	6	3	0	17
154413	WTRMA004217	118.49	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
154436	WTRMA004217	24.58	AC	200	1978		0	0	Commercial	8	6	3	0	17
154437	WTRMA004217	71.97	AC	200	1978		0	0	Commercial	8	6	3	0	17
154457	WTRMA001240	4.11	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
154458	WTRMA001240	23.67	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
154503	WTRMA001192	8.17	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154504	WTRMA001192	4.02	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
154525	WTRMA001254	14.68	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
154546	WTRMA001249	0.97	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
154569	WTRMA001265	11.06	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
154705	WTRMA001258	20.88	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
154794	WTRMA001254	4.88	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
154795	WTRMA001254	6.01	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
154890	WTRMA001254	3.90	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
154913	WTRMA001254	24.28	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
154938	WTRMA001254	3.40	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
154939	WTRMA001254	2.31	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155007	WTRMA001254	22.16	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155036	WTRMA001254	4.09	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155037	WTRMA001254	10.13	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155060	WTRMA001255	0.45	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155082	WTRMA001255	3.65	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155115	WTRMA001255	23.67	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155138	WTRMA001255	4.20	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155139	WTRMA001255	17.04	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155161	WTRMA001255	6.68	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155208	WTRMA001255	4.67	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155209	WTRMA001255	1.43	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155240	WTRMA001260	14.75	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
155259	WTRMA001263	14.75	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155274	WTRMA001263	4.00	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155275	WTRMA001263	9.90	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155297	WTRMA001263	9.11	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155298	WTRMA001263	16.90	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155320	WTRMA005486	2.04	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
155321	WTRMA005486	28.03	PVC	200	2007		0	0	Multifamily	5	0	1	0	6
155354	WTRMA005486	2.00	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
155355	WTRMA005486	25.79	PVC	200	2007		0	0	Multifamily	5	0	1	0	6
155391	WTRMA001265	5.02	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155420	WTRMA001265	24.67	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155459	WTRMA001249	3.32	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155481	WTRMA001249	0.78	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155482	WTRMA001249	3.42	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155504	WTRMA001249	0.15	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155527	WTRMA001255	13.66	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
155551	WTRMA001553	0.52	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155573	WTRMA001548	6.81	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155574	WTRMA001548	83.30	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155596	WTRMA001553	39.85	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155597	WTRMA001553	27.70	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155619	WTRMA001559	98.39	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155642	WTRMA001563	2.16	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155643	WTRMA001563	8.66	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155665	WTRMA001564	40.13	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155688	WTRMA001564	19.89	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155689	WTRMA001564	23.75	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155711	WTRMA001568	19.73	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155734	WTRMA001568	24.99	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155735	WTRMA001568	14.65	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
155788	WTRMA001593	2.42	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
155810	WTRMA001590	3.05	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
155857	WTRMA001590	17.39	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
155879	WTRMA001593	10.91	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
155880	WTRMA001593	18.29	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
156054	WTRMA003632	18.69	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
156055	WTRMA003632	13.05	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
156077	WTRMA003631	11.16	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
156078	WTRMA003631	31.34	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
156100	WTRMA003616	5.76	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
156101	WTRMA003616	2.24	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
156124	WTRMA003616	20.44	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
156146	WTRMA003616	24.28	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
156147	WTRMA003616	0.28	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
156169	WTRMA003616	15.84	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
156170	WTRMA003616	1.19	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
156192	WTRMA003620	13.13	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
156215	WTRMA003627	19.38	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
156216	WTRMA003627	7.12	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
156238	WTRMA002284	5.27	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
156239	WTRMA002284	17.41	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
156282	WTRMA001249	24.65	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
156283	WTRMA001249	2.74	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
156329	WTRMA001614	17.58	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
156869	WTRMA005795	14.69	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
156870	WTRMA005795	5.15	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
156902	WTRMA005794	5.50	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
156903	WTRMA005794	6.11	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
156933	WTRMA005793	15.88	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
157093	WTRMA005793	3.77	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
157094	WTRMA005793	11.02	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
157254	WTRMA004484	8.27	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
157261	WTRMA004484	0.44	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
157452	WTRMA005816	3.52	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
157453	WTRMA005816	26.26	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
157708	WTRMA007834	1.85	AC	200	1984		0	0	Parks, open space, and trails	1	6	3	0	10
157716	WTRMA007835	26.82	AC		1984		0	0	Parks, open space, and trails	1	6	3	0	10
157765	WTRMA007836	2.71	HDPE	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157774	WTRMA007837	10.08	HDPE	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157775	WTRMA007837	0.48	HDPE	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157781	WTRMA007838	1.17	HDPE	50	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157788	WTRMA007839	0.94	HDPE	50	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157793	WTRMA007840	5.02	HDPE	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157798	WTRMA007841	4.88	HDPE	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157803	WTRMA003336	0.16	AC	50	1984		0	0	Parks, open space, and trails	1	6	3	0	10
157804	WTRMA003336	132.20	AC	50	1984		0	0	Parks, open space, and trails	1	6	3	0	10
157812	WTRMA007842	1.55	HDPE	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157817	WTRMA007843	0.65	HDPE	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
157822	WTRMA007844	73.06	HDPE	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157827	WTRMA007845	9.54	HDPE	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157832	WTRMA007846	4.48	HDPE	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157841	WTRMA007847	0.83	PVC	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157842	WTRMA007847	4.30	PVC	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157848	WTRMA007848	1.00	PVC	150	2012		0	0	Parks, open space, and trails	1	0	1	0	2
157858	WTRMA007850	0.07	HDPE		2012		0	0	Parks, open space, and trails	1	0	1	0	2
157863	WTRMA007851	0.07	HDPE		2012		0	0	Parks, open space, and trails	1	0	1	0	2
158159	WTRMA004484	15.14	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
158160	WTRMA004484	3.52	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
158182	WTRMA004484	9.81	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
158183	WTRMA004484	8.48	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
158205	WTRMA004479	17.50	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
158206	WTRMA004479	19.00	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
158253	WTRMA007874	40.99	PVC	200	2012		0	0	SF - Residential	1	0	1	0	2
158258	WTRMA007875	1.95	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158285	WTRMA007878	18.85	PVC	200	2012		0	0	SF - Residential	1	0	1	0	2
158290	WTRMA007879	4.04	PVC	200	2012		0	0	SF - Residential	1	0	1	0	2
158295	WTRMA007880	1.95	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158300	WTRMA007881	12.17	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158363	WTRMA007884	105.28	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158373	WTRMA007886	43.53	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158378	WTRMA007887	6.01	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158385	WTRMA007888	5.36	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158395	WTRMA007883	32.11	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158413	WTRMA007885	7.50	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158414	WTRMA007902	1.00	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158426	WTRMA007893	11.99	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158450	WTRMA007894	31.71	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158451	WTRMA007894	49.37	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158458	WTRMA007897	11.99	PVC	200	2012		0	0	SF - Residential	1	0	1	0	2
158473	WTRMA007900	117.94	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158478	WTRMA007901	90.69	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158483	WTRMA007902	6.00	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158488	WTRMA007903	3.90	PVC	300	2012		0	0	SF - Residential	1	0	1	0	2
158631	WTRMA007905	15.50	PVC	200	2012		0	0	SF - Residential	1	0	1	0	2
158680	WTRMA007910	6.06	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158712	WTRMA007916	10.93	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158717	WTRMA007917	7.14	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158764	WTRMA007926	10.12	PVC	200	2012		0	0	SF - Residential	1	0	1	0	2
158804	WTRMA007911	28.35	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158805	WTRMA007911	0.74	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158812	WTRMA007911	8.13	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158822	WTRMA007918	14.72	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158842	WTRMA007925	14.99	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158910	WTRMA007908	18.13	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158918	WTRMA007908	1.77	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158926	WTRMA007908	29.34	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158934	WTRMA007908	1.63	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158935	WTRMA007908	17.26	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158942	WTRMA007909	11.13	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158943	WTRMA007909	0.67	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158960	WTRMA007915	1.71	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158968	WTRMA007915	32.91	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158976	WTRMA007915	1.68	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158977	WTRMA007915	5.71	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158984	WTRMA007915	22.87	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158992	WTRMA007915	1.80	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
158993	WTRMA007915	6.02	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159000	WTRMA007922	4.63	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159001	WTRMA007922	0.46	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159016	WTRMA007925	1.77	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159024	WTRMA007925	16.59	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159025	WTRMA007925	5.66	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159032	WTRMA007918	2.18	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159033	WTRMA007918	10.56	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159040	WTRMA007918	0.82	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159049	WTRMA007918	0.32	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159058	WTRMA007911	1.67	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159059	WTRMA007911	1.18	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159094	WTRMA007915	0.94	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159095	WTRMA007915	28.49	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159184	WTRMA007925	1.32	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159185	WTRMA007925	21.64	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
159393	WTRMA007904	8.31	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
159394	WTRMA007904	1.28	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
159422	WTRMA000890	15.70	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
159435	WTRMA000890	41.77	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
159436	WTRMA000890	0.49	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
159445	WTRMA000898	35.34	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
159452	WTRMA000898	20.67	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
159453	WTRMA000898	0.50	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
159482	WTRMA000900	17.76	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
159483	WTRMA000900	0.50	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
159532	WTRMA005833	12.67	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
159533	WTRMA005833	25.86	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
159554	WTRMA001897	1.92	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
159555	WTRMA001897	0.99	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
159634	WTRMA001946	36.00	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
159635	WTRMA001946	1.18	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
159736	WTRMA001969	1.47	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
159737	WTRMA001969	33.84	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
159934	WTRMA001962	29.01	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
159935	WTRMA001962	16.95	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
159946	WTRMA001948	1.02	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
159968	WTRMA001962	19.05	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
159969	WTRMA001962	6.20	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
159991	WTRMA001967	10.96	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
160084	WTRMA001948	21.28	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
160098	WTRMA001948	19.00	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
160099	WTRMA001948	10.50	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
160152	WTRMA005839	35.65	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
160173	WTRMA005839	1.33	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
160174	WTRMA005839	3.88	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
160205	WTRMA005836	28.01	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
160219	WTRMA005834	2.10	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
160220	WTRMA005834	2.14	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
160258	WTRMA001970	25.76	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
160303	WTRMA001972	10.43	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
160391	WTRMA002856	6.44	PVC	400	1989		0	0	SF - Residential	6	4	1	0	11
160405	WTRMA002856	4.61	PVC	400	1989		0	0	SF - Residential	6	4	1	0	11
160406	WTRMA002856	11.25	PVC	400	1989		0	0	SF - Residential	6	4	1	0	11
160420	WTRMA002856	3.38	PVC	400	1989		0	0	SF - Residential	6	4	1	0	11
160421	WTRMA002856	12.88	PVC	400	1989		0	0	SF - Residential	6	4	1	0	11
160435	WTRMA002855	4.52	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
160436	WTRMA002855	9.45	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
160460	WTRMA002843	5.14	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160512	WTRMA002817	13.69	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
160513	WTRMA002817	14.63	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
160527	WTRMA002816	15.11	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
160528	WTRMA002816	9.63	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
160542	WTRMA002845	0.35	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160543	WTRMA002845	3.34	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160557	WTRMA002845	1.90	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160558	WTRMA002845	7.80	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160581	WTRMA002819	8.54	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160582	WTRMA002819	4.42	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160611	WTRMA002809	13.93	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160626	WTRMA002809	14.33	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160627	WTRMA002809	1.49	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160642	WTRMA002811	7.56	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160656	WTRMA002811	15.41	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160657	WTRMA002811	15.02	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160686	WTRMA002802	14.87	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160687	WTRMA002802	3.66	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160701	WTRMA002804	2.76	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160702	WTRMA002804	15.18	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160716	WTRMA002809	14.72	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160717	WTRMA002809	16.09	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160746	WTRMA002802	7.04	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160747	WTRMA002802	4.95	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160762	WTRMA002802	12.36	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160777	WTRMA002802	0.37	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160792	WTRMA002802	16.35	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160821	WTRMA002802	12.13	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160822	WTRMA002802	0.87	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160836	WTRMA002802	12.44	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160837	WTRMA002802	2.25	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160852	WTRMA002802	7.89	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160866	WTRMA002802	14.12	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160867	WTRMA002802	16.46	PVC	250	1985		0	0	SF - Residential	1	6	1	0	8
160881	WTRMA002819	6.17	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160882	WTRMA002819	9.02	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160896	WTRMA002819	7.97	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160911	WTRMA002819	6.14	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160927	WTRMA002819	8.28	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160950	WTRMA002822	1.98	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160965	WTRMA002822	8.46	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160980	WTRMA002822	1.61	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
160995	WTRMA002822	10.78	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
161035	WTRMA002822	8.73	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
161049	WTRMA002822	4.09	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
161088	WTRMA002822	12.53	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
161099	WTRMA002822	0.98	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
161103	WTRMA002824	3.60	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
161104	WTRMA002824	1.44	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
161118	WTRMA002826	8.75	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161119	WTRMA002826	3.66	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161133	WTRMA002829	5.68	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161148	WTRMA002829	12.16	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161163	WTRMA002829	12.92	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161164	WTRMA002829	4.77	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161193	WTRMA002832	7.74	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161194	WTRMA002832	1.29	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161208	WTRMA002832	13.38	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161223	WTRMA002832	0.57	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161247	WTRMA002832	13.16	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161286	WTRMA002833	1.71	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161287	WTRMA002833	3.70	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161301	WTRMA002835	10.93	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
161316	WTRMA002835	13.69	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
161317	WTRMA002835	40.70	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
161340	WTRMA002869	6.06	AC	400	1980		0	0	Institutional	15	6	3	0	24
161355	WTRMA002588	6.33	PVC	400	1985		0	0	Institutional	15	6	1	0	22
161356	WTRMA002588	3.05	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
161371	WTRMA002589	6.88	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161385	WTRMA002589	5.59	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161386	WTRMA002589	5.87	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161401	WTRMA002589	6.34	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161416	WTRMA002589	7.26	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161431	WTRMA002589	5.84	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161446	WTRMA002589	6.27	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161460	WTRMA002589	1.96	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161461	WTRMA002589	5.30	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161476	WTRMA002590	4.52	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161491	WTRMA002590	7.86	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161538	WTRMA002590	5.24	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161539	WTRMA002590	6.70	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
161587	WTRMA002596	5.90	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
161632	WTRMA002596	7.33	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
161647	WTRMA002596	5.42	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
161661	WTRMA002596	0.43	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
161662	WTRMA002596	5.76	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
161676	WTRMA002597	5.60	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
161691	WTRMA002597	16.06	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
161692	WTRMA002597	10.57	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
161706	WTRMA002597	3.41	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
161707	WTRMA002597	34.87	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
161721	WTRMA002659	13.52	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
161722	WTRMA002659	14.75	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
161736	WTRMA001496	0.83	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
161737	WTRMA001496	1.30	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
161785	WTRMA001812	23.57	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
161833	WTRMA001649	6.42	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
161834	WTRMA001649	3.12	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
161849	WTRMA001653	4.14	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
161864	WTRMA001653	27.40	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
161886	WTRMA001653	21.76	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
161945	WTRMA001654	17.12	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
161967	WTRMA001654	17.63	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
161989	WTRMA001654	16.11	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
161990	WTRMA001654	5.50	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162004	WTRMA001657	11.63	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162005	WTRMA001657	4.25	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162026	WTRMA001658	2.26	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162027	WTRMA001658	3.66	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162041	WTRMA001659	3.61	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162095	WTRMA001659	1.47	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162116	WTRMA001653	6.41	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162131	WTRMA001654	1.58	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162132	WTRMA001654	15.38	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162375	WTRMA001659	25.22	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162376	WTRMA001659	32.35	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162412	WTRMA001648	10.11	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162413	WTRMA001648	0.93	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162434	WTRMA001647	28.24	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162435	WTRMA001647	8.17	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162462	WTRMA001624	1.04	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
162463	WTRMA001624	5.48	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
162479	WTRMA001624	3.13	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
162480	WTRMA001624	7.70	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
162495	WTRMA001624	14.27	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
162509	WTRMA001619	0.78	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
162510	WTRMA001619	18.24	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
162533	WTRMA001619	0.82	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
162548	WTRMA001616	3.60	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
162549	WTRMA001616	4.05	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
162563	WTRMA001615	1.12	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
162633	WTRMA001663	0.14	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162634	WTRMA001663	4.49	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162764	WTRMA001659	3.99	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162778	WTRMA001662	0.75	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162779	WTRMA001662	3.34	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
162801	WTRMA001659	29.24	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163044	WTRMA001672	3.63	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163104	WTRMA001672	25.68	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163126	WTRMA001672	7.30	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163148	WTRMA001672	25.68	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163178	WTRMA001672	7.29	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163245	WTRMA001672	5.03	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163444	WTRMA001672	7.30	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163465	WTRMA001672	2.07	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163466	WTRMA001672	21.34	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163514	WTRMA001672	25.70	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163515	WTRMA001672	5.27	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163525	WTRMA001672	15.34	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163526	WTRMA001672	2.93	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163537	WTRMA001642	1.20	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163577	WTRMA001642	5.03	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163613	WTRMA001642	24.15	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163614	WTRMA001642	4.83	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163652	WTRMA001642	22.00	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163673	WTRMA001641	4.29	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163688	WTRMA001638	3.90	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163797	WTRMA001642	3.61	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163798	WTRMA001642	8.57	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163803	WTRMA001642	26.35	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163804	WTRMA001642	4.53	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163809	WTRMA001641	0.22	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163810	WTRMA001641	4.64	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163815	WTRMA001638	22.58	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163816	WTRMA001638	4.33	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163821	WTRMA001638	13.26	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
163822	WTRMA001638	17.72	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163827	WTRMA001638	9.46	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
163828	WTRMA001638	32.56	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164034	WTRMA001609	15.26	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164040	WTRMA001609	14.11	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164049	WTRMA001609	15.40	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164064	WTRMA001614	5.55	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164096	WTRMA001614	8.20	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164097	WTRMA001614	7.89	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164111	WTRMA001614	8.58	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164112	WTRMA001614	8.62	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164127	WTRMA001614	8.99	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164141	WTRMA001614	16.29	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164142	WTRMA001614	7.96	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164151	WTRMA001614	8.71	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164152	WTRMA001614	7.71	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164166	WTRMA001614	8.54	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164167	WTRMA001614	8.00	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
164198	WTRMA001675	6.11	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164199	WTRMA001675	3.78	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164213	WTRMA001675	5.38	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164229	WTRMA001675	13.85	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164267	WTRMA005507	15.33	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164312	WTRMA005507	2.27	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164313	WTRMA005507	1.10	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164437	WTRMA001675	22.38	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164438	WTRMA001675	6.71	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164451	WTRMA001637	7.25	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164499	WTRMA001637	0.83	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164500	WTRMA001637	1.14	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164516	WTRMA001637	0.43	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164517	WTRMA001637	0.78	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
164672	WTRMA002382	8.17	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
164673	WTRMA002382	5.52	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
164687	WTRMA002382	10.37	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
164688	WTRMA002382	5.92	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
164702	WTRMA002382	10.07	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
164703	WTRMA002382	8.62	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
164717	WTRMA002382	4.37	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
164718	WTRMA002382	7.28	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
164733	WTRMA002392	19.01	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
164748	WTRMA002392	14.19	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
164772	WTRMA002379	14.19	AC	350	1980		0	0	Institutional	15	6	3	0	24
164787	WTRMA002379	16.39	AC	350	1980		0	0	Institutional	15	6	3	0	24
164802	WTRMA002379	16.10	AC	350	1980		0	0	Institutional	15	6	3	0	24
164817	WTRMA002379	16.39	AC	350	1980		0	0	Institutional	15	6	3	0	24
164832	WTRMA002392	16.89	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
164847	WTRMA002392	15.75	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
164861	WTRMA002392	4.58	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
164862	WTRMA002392	8.71	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
164925	WTRMA002397	12.29	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
164964	WTRMA002397	0.30	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165003	WTRMA002397	15.00	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165074	WTRMA002397	6.46	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165089	WTRMA002397	0.30	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165090	WTRMA002397	16.60	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165105	WTRMA002394	8.93	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165129	WTRMA002393	6.50	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165151	WTRMA002393	16.30	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165166	WTRMA002393	0.70	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165181	WTRMA002393	14.49	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165238	WTRMA002393	1.20	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165253	WTRMA002393	12.50	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165291	WTRMA002393	1.71	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165292	WTRMA002393	0.95	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165307	WTRMA002379	15.49	AC	350	1980		0	0	Institutional	15	6	3	0	24
165321	WTRMA002379	15.49	AC	350	1980		0	0	Institutional	15	6	3	0	24
165335	WTRMA002379	15.89	AC	350	1980		0	0	Institutional	15	6	3	0	24
165348	WTRMA002379	11.18	AC	350	1980		0	0	Institutional	15	6	3	0	24
165349	WTRMA002379	14.89	AC	350	1980		0	0	Institutional	15	6	3	0	24
165362	WTRMA002390	12.32	AC	150	1980		0	0	Institutional	10	6	3	0	19
165376	WTRMA002390	10.23	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165388	WTRMA002390	2.73	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165404	WTRMA002390	11.51	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165418	WTRMA002390	21.66	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165440	WTRMA002390	17.66	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165441	WTRMA002390	13.18	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165446	WTRMA002393	13.89	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165447	WTRMA002393	9.17	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165453	WTRMA002393	15.50	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165461	WTRMA002393	0.41	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165468	WTRMA002397	8.85	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165469	WTRMA002397	7.49	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165484	WTRMA002386	5.77	AC	300	1980		0	0	Commercial	8	6	3	0	17
165485	WTRMA002386	7.90	AC	300	1980		0	0	Commercial	8	6	3	0	17
165497	WTRMA002387	16.09	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
165511	WTRMA002387	23.25	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
165525	WTRMA002387	10.89	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
165526	WTRMA002387	5.42	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
165539	WTRMA002401	10.48	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
165553	WTRMA002401	13.39	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
165567	WTRMA002401	17.79	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
165581	WTRMA002401	12.70	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
165595	WTRMA002401	17.79	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
165609	WTRMA002401	9.89	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
165610	WTRMA002401	11.68	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
165637	WTRMA002409	8.35	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165638	WTRMA002409	1.41	AC	150	1980		0	0	SF - Residential	1	6	3	0	10

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
165652	WTRMA002409	1.20	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165674	WTRMA002409	1.63	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165687	WTRMA002409	1.69	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165688	WTRMA002409	3.17	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165702	WTRMA002444	12.30	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165716	WTRMA002444	14.63	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165730	WTRMA002444	14.34	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165744	WTRMA002444	15.58	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165757	WTRMA002444	21.58	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165758	WTRMA002444	20.27	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165769	WTRMA002449	8.74	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165793	WTRMA005069	3.49	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165807	WTRMA005069	13.99	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165821	WTRMA005069	13.39	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165835	WTRMA005069	13.40	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165836	WTRMA005069	4.00	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165849	WTRMA005302	3.00	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165863	WTRMA005302	3.88	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165864	WTRMA005302	5.23	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165877	WTRMA005319	13.24	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165891	WTRMA005319	0.70	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165905	WTRMA005319	1.59	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165933	WTRMA005319	1.15	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165934	WTRMA005319	2.09	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165948	WTRMA005319	4.24	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165961	WTRMA005319	0.96	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165962	WTRMA005319	2.31	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165976	WTRMA002445	14.80	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
165997	WTRMA002445	3.93	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166011	WTRMA002446	0.05	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166012	WTRMA002446	11.66	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166026	WTRMA002447	15.54	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166039	WTRMA002447	33.81	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166040	WTRMA002447	13.99	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166047	WTRMA002445	15.09	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166048	WTRMA002445	13.59	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166059	WTRMA002462	7.63	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166081	WTRMA002462	3.16	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166082	WTRMA002462	0.97	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166109	WTRMA002465	7.77	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166110	WTRMA002465	1.61	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166123	WTRMA002465	1.13	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166124	WTRMA002465	8.10	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166153	WTRMA002456	19.18	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166167	WTRMA002456	0.36	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166168	WTRMA002456	20.18	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166182	WTRMA002456	0.50	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166248	WTRMA002456	20.59	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166261	WTRMA002456	7.32	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166262	WTRMA002456	18.00	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166270	WTRMA002456	16.22	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166271	WTRMA002456	4.28	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166276	WTRMA002456	17.17	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166282	WTRMA002456	1.68	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166283	WTRMA002456	19.00	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166288	WTRMA002462	1.26	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166289	WTRMA002462	4.81	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166314	WTRMA002491	1.06	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
166315	WTRMA002491	0.74	PVC	200	1991		0	0	SF - Residential	1	4	1	0	6
166328	WTRMA002487	6.83	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
166329	WTRMA002487	17.00	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
166342	WTRMA002468	13.98	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
166343	WTRMA002468	4.82	PVC	300	1986		0	0	SF - Residential	1	4	1	0	6
166356	WTRMA002461	18.22	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166357	WTRMA002461	7.01	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
166443	WTRMA008393	8.97	PVC	200	2011	2012	0	0	N/A	0	0	0	0	0
166447	WTRMA008394	6.22	PVC	250	2011	2012	0	0	N/A	0	0	0	0	0
166451	WTRMA008395	11.79	PVC	250	2011	2012	0	0	N/A	0	0	0	0	0
166478	WTRMA008387	3.14	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
166485	WTRMA008392	3.18	PVC	200	2011	2012	0	0	N/A	0	0	0	0	0
166493	WTRMA008390	44.15	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166509	WTRMA008390	1.06	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166510	WTRMA008390	0.68	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166517	WTRMA008390	1.02	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166525	WTRMA008390	22.00	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166533	WTRMA008390	1.62	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166541	WTRMA008390	20.36	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166549	WTRMA008390	4.58	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166550	WTRMA008390	0.49	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166582	WTRMA008388	13.83	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166590	WTRMA008389	13.54	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166597	WTRMA008389	41.75	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166598	WTRMA008389	2.50	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166605	WTRMA008388	26.36	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166606	WTRMA008388	2.07	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
166861	WTRMA001409	42.92	PVC	400	2005		0	0	Industrial	5	2	1	0	8
166862	WTRMA001409	48.04	PVC	400	2005		0	0	Industrial	5	2	1	0	8
166875	WTRMA001405	10.85	PVC	400	2005		0	0	Industrial	5	2	1	0	8
166889	WTRMA001405	53.84	PVC	400	2005		0	0	Industrial	5	2	1	0	8
166890	WTRMA001405	52.26	PVC	400	2005		0	0	Industrial	5	2	1	0	8
166912	WTRMA001415	19.83	PVC	400	2004		0	0	Industrial	12	2	1	0	15
166925	WTRMA001415	63.01	PVC	400	2004		0	0	Industrial	12	2	1	0	15
166926	WTRMA001415	34.00	PVC	400	2004		0	0	Industrial	12	2	1	0	15
166939	WTRMA001401	83.30	PVC	400	2005		0	0	Industrial	5	2	1	0	8
166940	WTRMA001401	25.70	PVC	400	2005		0	0	Industrial	5	2	1	0	8
166953	WTRMA001419	92.21	PVC	400	2004		0	0	Industrial	12	2	1	0	15
166967	WTRMA001419	1.97	PVC	400	2004		0	0	Industrial	12	2	1	0	15
166968	WTRMA001419	22.45	PVC	400	2004		0	0	Industrial	12	2	1	0	15

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
166981	WTRMA001423	22.14	PVC	400	2004		0	0	Industrial	12	2	1	0	15
166995	WTRMA001423	48.76	PVC	400	2004		0	0	Industrial	12	2	1	0	15
166996	WTRMA001423	47.05	PVC	400	2004		0	0	Industrial	12	2	1	0	15
167031	WTRMA001431	81.74	PVC	400	2004		0	0	Industrial	12	2	1	0	15
167045	WTRMA001435	3.33	PVC	400	2004		0	0	Industrial	12	2	1	0	15
167046	WTRMA001435	39.26	PVC	400	2004		0	0	Industrial	12	2	1	0	15
167059	WTRMA001435	31.79	PVC	400	2004		0	0	Industrial	12	2	1	0	15
167060	WTRMA001435	42.21	PVC	400	2004		0	0	Industrial	12	2	1	0	15
167073	WTRMA001358	31.18	PVC	400	1997		0	0	Industrial	12	2	1	0	15
167074	WTRMA001358	25.06	PVC	400	1997		0	0	Industrial	12	2	1	0	15
167093	WTRMA001360	31.63	PVC	250	1997		0	0	Industrial	7	2	1	0	10
167107	WTRMA001375	23.62	PVC	250	2000		0	0	Industrial	7	2	1	0	10
167108	WTRMA001375	19.79	PVC	250	2000		1	6	Industrial	7	2	1	0	16
167128	WTRMA001367	25.71	PVC	400	2000		0	0	Industrial	12	2	1	0	15
167142	WTRMA001367	27.32	PVC	400	2000		0	0	Industrial	12	2	1	0	15
167156	WTRMA001377	19.36	PVC	400	2004		0	0	Industrial	12	2	1	0	15
167170	WTRMA001377	33.28	PVC	400	2004		0	0	Industrial	12	2	1	0	15
167184	WTRMA001380	33.37	PVC	400	2004		0	0	Industrial	12	2	1	0	15
167198	WTRMA001380	0.30	PVC	400	2004		0	0	Industrial	12	2	1	0	15
167211	WTRMA001387	42.58	PVC	250	2004		0	0	Industrial	7	2	1	0	10
167212	WTRMA001387	53.96	PVC	250	2004		0	0	Industrial	7	2	1	0	10
167225	WTRMA001390	9.79	PVC	250	2004		0	0	Industrial	7	2	1	0	10
167226	WTRMA001390	38.16	PVC	250	2004		0	0	Industrial	7	2	1	0	10
167233	WTRMA001427	2.89	PVC	400	2004		0	0	Industrial	12	2	1	0	15
167234	WTRMA001427	62.16	PVC	400	2004		0	0	Industrial	12	2	1	0	15
167257	WTRMA001391	0.30	PVC	250	2004		0	0	Industrial	7	2	1	0	10
167258	WTRMA001391	55.18	PVC	250	2004		0	0	Industrial	7	2	1	0	10
167273	WTRMA001352	13.35	PVC	400	1997		0	0	Industrial	12	2	1	0	15
167274	WTRMA001352	106.62	PVC	400	1997		0	0	Industrial	12	2	1	0	15
167287	WTRMA001348	23.07	PVC	400	1997		0	0	Industrial	12	2	1	0	15
167307	WTRMA001344	2.38	PVC	400	1997		0	0	Industrial	12	2	1	0	15
167308	WTRMA001344	111.59	PVC	400	1997		0	0	Industrial	12	2	1	0	15
167322	WTRMA001335	34.34	PVC	400	1989		0	0	Industrial	12	4	1	0	17
167336	WTRMA001335	21.31	PVC	400	1989		0	0	Industrial	12	4	1	0	17
167349	WTRMA001335	23.97	PVC	400	1989		0	0	Industrial	12	4	1	0	17
167350	WTRMA001335	45.30	PVC	400	1989		1	6	Industrial	12	4	1	0	23
167363	WTRMA001337	6.17	PVC	150	1990		0	0	Industrial	7	4	1	0	12
167364	WTRMA001337	54.22	PVC	150	1990		0	0	Industrial	7	4	1	0	12
167383	WTRMA004922	26.76	PVC	150	2003		0	0	Institutional	10	2	1	0	13
167384	WTRMA004922	72.43	PVC	150	2003		0	0	Institutional	10	2	1	0	13
167411	WTRMA000086	2.28	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167412	WTRMA000086	5.48	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167426	WTRMA000086	13.47	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167482	WTRMA000086	1.27	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167496	WTRMA000086	14.46	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167553	WTRMA000086	12.93	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167567	WTRMA000086	15.45	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167568	WTRMA000086	0.90	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167576	WTRMA000086	17.36	AC	150	1982	1974	0	0	SF - Residential	1	6	3	0	10
167577	WTRMA000086	13.09	AC	150	1982	1974	0	0	SF - Residential	1	6	3	0	10
167583	WTRMA000086	19.00	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167589	WTRMA000086	14.17	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167590	WTRMA000086	0.87	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167595	WTRMA000086	13.36	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167596	WTRMA000086	1.32	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
167606	WTRMA003550	1.85	CI	150	1954	1974	0	0	N/A	0	0	0	0	0
167620	WTRMA003550	6.01	CI	150	1954	1974	0	0	N/A	0	0	0	0	0
167650	WTRMA003540	2.49	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
167664	WTRMA003540	11.10	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
167677	WTRMA003550	120.16	CI	150	1954	1974	0	0	N/A	0	0	0	0	0
167678	WTRMA003550	41.74	CI	150	1954	1974	0	0	N/A	0	0	0	0	0
167728	WTRMA003540	7.53	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
167741	WTRMA003540	47.32	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
167742	WTRMA003540	14.80	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
167769	WTRMA00351	10.63	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167770	WTRMA00351	9.00	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167805	WTRMA00351	2.61	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167819	WTRMA00351	4.32	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167833	WTRMA00351	9.24	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167847	WTRMA00351	1.80	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167869	WTRMA00352	7.60	AC	400	1975		0	0	SF - Residential	6	8	3	5	22
167883	WTRMA00352	7.82	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167884	WTRMA00352	33.82	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167897	WTRMA00377	1.61	PVC	300	1995		0	0	SF - Residential	1	4	1	0	6
167898	WTRMA00377	2.39	PVC	300	1995		0	0	SF - Residential	1	4	1	0	6
167912	WTRMA00328	189.18	AC	200	1967		0	0	Industrial	7	8	3	0	18
167932	WTRMA00351	9.83	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167940	WTRMA003540	13.25	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
167941	WTRMA003540	9.57	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
167954	WTRMA003540	18.93	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
167955	WTRMA003540	14.06	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
167964	WTRMA003540	13.00	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
167965	WTRMA003540	14.90	AC	150	1974		0	0	SF - Residential	1	8	3	0	12
167974	WTRMA00351	15.92	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167975	WTRMA00351	0.59	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167980	WTRMA00351	15.69	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167981	WTRMA00351	12.31	AC	400	1975		0	0	SF - Residential	6	8	3	0	17
167995	WTRMA005758	0.75	PVC	250	2009		0	0	Industrial	7	0	1	0	8
167996	WTRMA005758	2.42	PVC	250	2009		0	0	Industrial	7	0	1	0	8
168007	WTRMA005757	54.51	PVC	250	2009		0	0	Industrial	7	0	1	0	8
168021	WTRMA005757	9.85	PVC	250	2009		0	0	Industrial	7	0	1	0	8
168037	WTRMA005766	13.41	PVC	250	2009		0	0	Industrial	7	0	1	0	8
168038	WTRMA005766	3.31	PVC	250	2009		0	0	Industrial	7	0	1	0	8
168049	WTRMA005757	10.50	PVC	250	2009		0	0	Industrial	7	0	1	0	8
168050	WTRMA005757	5.75	PVC	250	2009		0	0	Industrial	7	0	1	0	8
168065	WTRMA005753	63.36	PVC	250	2009		0	0	Industrial	7	0	1	0	8
168085	WTRMA005753	10.00	PVC	250	2009		0	0	Industrial	7	0	1	0	8
168086	WTRMA005753	21.77	PVC	250	2009		0	0	Industrial	7	0	1	0	8

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
168167	WTRMA000047	9.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168181	WTRMA000047	15.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168182	WTRMA000047	13.06	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168195	WTRMA000043	9.52	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168209	WTRMA000043	18.99	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168223	WTRMA000043	7.00	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168259	WTRMA000043	7.82	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168273	WTRMA000043	12.99	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168287	WTRMA000043	16.98	AC	150	1982		1	6	SF - Residential	1	6	3	0	16
168310	WTRMA000043	9.96	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168323	WTRMA000039	10.06	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168351	WTRMA000039	6.97	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168387	WTRMA000039	23.00	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168401	WTRMA000039	12.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168402	WTRMA000039	13.44	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168415	WTRMA000039	16.55	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168429	WTRMA000039	21.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168443	WTRMA000039	9.00	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168457	WTRMA000039	19.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168471	WTRMA000039	7.00	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168472	WTRMA000039	9.95	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168485	WTRMA000031	3.11	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168499	WTRMA000031	5.72	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168513	WTRMA000031	11.47	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168527	WTRMA000031	5.45	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168541	WTRMA000031	5.99	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168555	WTRMA000031	6.05	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168605	WTRMA000031	1.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168606	WTRMA000031	3.02	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168619	WTRMA000031	12.93	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168633	WTRMA000031	9.96	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168669	WTRMA000031	9.02	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168683	WTRMA000031	7.20	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168714	WTRMA000031	25.06	AC	150	1982		1	6	SF - Residential	1	6	3	0	16
168727	WTRMA000051	21.20	AC	400	1982		0	0	Commercial	13	6	3	0	22
168728	WTRMA000051	73.18	AC	400	1982		0	0	SF - Residential	6	6	3	0	15
168741	WTRMA000079	93.30	CI	200	1960	1985	0	0	N/A	0	0	0	0	0
168742	WTRMA000079	3.98	CI	200	1960	1985	0	0	N/A	0	0	0	0	0
168754	WTRMA000007	7.26	AC	400	1982		0	0	Commercial	13	6	3	0	22
168770	WTRMA000007	5.40	AC	400	1982		0	0	Commercial	13	6	3	0	22
168784	WTRMA000007	22.91	AC	400	1982		0	0	Commercial	13	6	3	0	22
168818	WTRMA000007	22.47	AC	400	1982		0	0	Commercial	13	6	3	0	22
168832	WTRMA000007	10.50	AC	400	1982		0	0	Commercial	13	6	3	0	22
168846	WTRMA000007	20.99	AC	400	1982		0	0	Commercial	13	6	3	0	22
168884	WTRMA000007	9.51	AC	400	1982		0	0	Commercial	13	6	3	0	22
168905	WTRMA000007	8.46	AC	400	1982		0	0	Commercial	13	6	3	0	22
168906	WTRMA000007	9.96	AC	400	1982		0	0	Commercial	13	6	3	0	22
168919	WTRMA000021	6.62	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168955	WTRMA000021	10.46	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168969	WTRMA000021	5.44	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
168983	WTRMA000021	18.78	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169041	WTRMA000021	32.09	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169042	WTRMA000021	2.07	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169055	WTRMA000024	3.63	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169069	WTRMA000024	20.19	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169083	WTRMA000024	19.68	AC	150	1982		0	0	Institutional	10	6	3	0	19
169097	WTRMA000024	10.90	AC	150	1982		0	0	Institutional	10	6	3	0	19
169112	WTRMA000010	9.06	AC	400	1982		0	0	Commercial	13	6	3	0	22
169126	WTRMA000010	13.49	AC	400	1982		0	0	Commercial	13	6	3	0	22
169140	WTRMA000010	16.49	AC	400	1982		0	0	Commercial	13	6	3	0	22
169154	WTRMA000010	7.60	AC	400	1982		0	0	Commercial	13	6	3	0	22
169168	WTRMA000010	20.87	AC	400	1982		0	0	Commercial	13	6	3	0	22
169182	WTRMA000010	12.19	AC	400	1982		0	0	Commercial	13	6	3	0	22
169210	WTRMA000010	9.60	AC	400	1982		0	0	Commercial	13	6	3	0	22
169224	WTRMA000010	30.38	AC	400	1982		0	0	Commercial	13	6	3	0	22
169238	WTRMA000010	11.00	AC	400	1982		0	0	Commercial	13	6	3	0	22
169251	WTRMA000024	22.91	AC	150	1982		0	0	Institutional	10	6	3	0	19
169265	WTRMA000024	6.84	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169279	WTRMA000024	15.80	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169293	WTRMA000024	15.75	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169307	WTRMA000024	21.01	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169321	WTRMA000024	14.01	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169335	WTRMA000024	17.85	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169336	WTRMA000024	12.42	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169349	WTRMA000010	17.55	AC	400	1982		0	0	Commercial & SF - residential	13	6	3	5	27
169350	WTRMA000010	5.47	AC	400	1982		0	0	Commercial	13	6	3	0	22
169371	WTRMA000013	2.27	AC	400	1982		0	0	Commercial	13	6	3	0	22
169421	WTRMA000013	2.97	AC	400	1982		0	0	Commercial	13	6	3	0	22
169435	WTRMA000013	12.60	AC	400	1982		0	0	Commercial	13	6	3	0	22
169449	WTRMA000013	10.38	AC	400	1982		0	0	Commercial	13	6	3	0	22
169463	WTRMA000013	5.59	AC	400	1982		0	0	Commercial	13	6	3	0	22
169491	WTRMA000013	5.35	AC	400	1982		0	0	Commercial	13	6	3	0	22
169541	WTRMA000027	7.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169555	WTRMA000027	7.54	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169599	WTRMA000027	7.32	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169613	WTRMA000027	8.26	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169641	WTRMA000027	5.39	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169642	WTRMA000027	4.73	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169655	WTRMA000027	3.52	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169677	WTRMA000027	23.29	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169691	WTRMA000027	1.41	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169692	WTRMA000027	13.78	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169705	WTRMA000025	15.05	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169706	WTRMA000025	4.83	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169713	WTRMA000013	6.90	AC	400	1982		0	0	Commercial	13	6	3	0	22
169714	WTRMA000013	25.41	AC	400	1982		0	0	Commercial	13	6	3	0	22
169719	WTRMA000010	9.76	AC	400	1982		0	0	Commercial	13	6	3	0	22

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
169720	WTRMA000010	18.51	AC	400	1982		0	0	Commercial	13	6	3	0	22
169725	WTRMA000007	9.59	AC	400	1982		0	0	Commercial	13	6	3	0	22
169726	WTRMA000007	5.88	AC	400	1982		0	0	Commercial	13	6	3	0	22
169731	WTRMA000007	26.98	AC	400	1982		0	0	Commercial	13	6	3	0	22
169732	WTRMA000007	12.37	AC	400	1982		0	0	Commercial	13	6	3	0	22
169737	WTRMA000027	10.26	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169773	WTRMA000027	6.12	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169774	WTRMA000027	8.07	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169781	WTRMA000027	4.29	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169787	WTRMA000027	3.18	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169788	WTRMA000027	7.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169793	WTRMA000021	16.68	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169794	WTRMA000021	12.70	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169799	WTRMA000021	18.51	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169800	WTRMA000021	23.77	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169805	WTRMA000021	2.72	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169806	WTRMA000021	21.50	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169811	WTRMA000047	21.51	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169812	WTRMA000047	16.46	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169817	WTRMA000047	10.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169824	WTRMA000047	15.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169825	WTRMA000047	29.99	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169830	WTRMA000043	41.95	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169831	WTRMA000043	9.99	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169836	WTRMA000043	24.98	AC	150	1982		1	6	SF - Residential	1	6	3	0	16
169837	WTRMA000043	19.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169842	WTRMA000039	6.08	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169843	WTRMA000039	5.86	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169855	WTRMA000369	43.13	AC	400	1975		0	0	Commercial	13	8	3	0	24
169869	WTRMA000369	0.68	AC	400	1975		0	0	Commercial	13	8	3	0	24
169883	WTRMA000369	14.36	AC	400	1975		0	0	Commercial	13	8	3	0	24
169896	WTRMA000369	15.70	AC	400	1975		0	0	Commercial	13	8	3	0	24
169897	WTRMA000369	11.39	AC	400	1975		0	0	Commercial	13	8	3	0	24
169910	WTRMA000013	6.84	AC	400	1982		0	0	Commercial	13	6	3	0	22
169924	WTRMA000013	30.19	AC	400	1982		0	0	Commercial	13	6	3	0	22
169925	WTRMA000013	16.54	AC	400	1982		0	0	Commercial	13	6	3	0	22
169961	WTRMA000027	14.34	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169975	WTRMA000027	2.43	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
169989	WTRMA000027	6.18	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
170003	WTRMA000027	8.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
170016	WTRMA000027	9.15	AC	150	1982		0	0	Commercial	8	6	3	0	17
170030	WTRMA000027	1.28	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
170031	WTRMA000027	6.88	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
170045	WTRMA000208	0.91	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170057	WTRMA000208	7.41	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170071	WTRMA000208	1.41	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170087	WTRMA000208	5.76	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170101	WTRMA000208	9.53	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170115	WTRMA000208	5.36	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170157	WTRMA000208	4.79	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170199	WTRMA000208	9.18	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170213	WTRMA000208	9.01	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170226	WTRMA000208	2.34	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170227	WTRMA000208	17.22	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170248	WTRMA000208	4.21	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170249	WTRMA000208	6.24	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170260	WTRMA000208	2.36	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170261	WTRMA000208	12.57	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170274	WTRMA000208	9.58	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170275	WTRMA000208	0.34	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170290	WTRMA000885	62.07	CI	150	1947		0	0	Commercial	8	12	10	0	30
170291	WTRMA000885	23.66	CI	150	1947		0	0	Commercial	8	12	10	0	30
170304	WTRMA000690	16.04	CI	150	1947		1	6	Commercial	8	12	10	0	36
170305	WTRMA000690	5.88	CI	150	1947		1	6	Commercial	8	12	10	0	36
170318	WTRMA000047	0.56	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
170332	WTRMA000047	11.48	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
170346	WTRMA000047	16.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
170347	WTRMA000047	10.99	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
170358	WTRMA000683	50.43	CI	150	1947		4	24	Commercial	8	12	10	0	54
170359	WTRMA000683	128.92	CI	150	1947		2	12	Commercial	8	12	10	0	42
170368	WTRMA000208	50.59	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170369	WTRMA000208	20.50	PVC	150	1988		0	0	Commercial	8	4	1	0	13
170381	WTRMA002042	79.44	PVC	300	1997		0	0	Industrial	7	2	1	0	10
170394	WTRMA002042	47.49	PVC	300	1997		0	0	Industrial	7	2	1	0	10
170395	WTRMA002042	23.31	PVC	300	1997		0	0	Industrial	7	2	1	0	10
170415	WTRMA005445	35.17	PVC	250	2008		0	0	Commercial	8	0	1	0	9
170429	WTRMA005445	19.91	PVC	250	2008		0	0	Commercial	8	0	1	0	9
170442	WTRMA005445	4.49	PVC	250	2008		0	0	Commercial	8	0	1	0	9
170443	WTRMA005445	82.43	PVC	250	2008		1	6	Commercial	8	0	1	0	15
170456	WTRMA000210	19.50	PVC	250	1988		0	0	Commercial	8	4	1	0	13
170487	WTRMA000210	20.00	PVC	250	1988		0	0	Commercial	8	4	1	0	13
170500	WTRMA000643	15.15	CI	150	1947		0	0	Commercial	8	12	10	0	30
170501	WTRMA000643	3.59	CI	150	1947		0	0	Commercial	8	12	10	0	30
170512	WTRMA000645	26.84	CI	150	1947		0	0	Institutional	10	12	10	0	32
170513	WTRMA000645	50.91	CI	150	1947		1	6	Institutional	10	12	10	0	38
170543	WTRMA000210	25.07	PVC	250	1988		0	0	Commercial	8	4	1	0	13
170556	WTRMA000579	54.71	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
170557	WTRMA000579	28.83	TRAN	150	1940		0	0	Commercial	8	14	1	0	23
170564	WTRMA000210	24.03	PVC	250	1988		0	0	Commercial	8	4	1	0	13
170574	WTRMA000210	5.83	PVC	250	1988		0	0	Commercial	8	4	1	0	13
170575	WTRMA000210	50.21	PVC	250	1988		1	6	Commercial	8	4	1	0	19
170587	WTRMA003981	45.10	AC	200	1967		0	0	SF - Residential	1	8	3	0	12
170588	WTRMA003981	6.07	AC	200	1967		0	0	SF - Residential	1	8	3	0	17
170601	WTRMA002802	25.54	PVC	150	1975		0	0	SF - Residential	1	8	1	0	10
170615	WTRMA002804	151.07	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
170616	WTRMA002804	58.03	PVC	150	1989		0	0	SF - Residential	1	4	1	0	6
170627	WTRMA000257	9.27	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6
170643	WTRMA000257	18.68	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
170657	WTRMA000257	37.18	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6
170671	WTRMA000257	22.76	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6
170685	WTRMA000257	11.39	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6
170699	WTRMA000257	21.46	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6
170713	WTRMA000257	2.95	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6
170727	WTRMA000257	10.29	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6
170728	WTRMA000257	14.87	PVC	150	1990		0	0	SF - Residential	1	4	1	0	6
170741	WTRMA0003034	6.31	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
170755	WTRMA0003034	68.44	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
170756	WTRMA0003034	26.49	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
170769	WTRMA0003039	1.08	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
170781	WTRMA0003039	27.56	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
170811	WTRMA0003046	19.50	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
170825	WTRMA0003046	52.98	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
170839	WTRMA0003046	20.99	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
170840	WTRMA0003046	36.67	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
170867	WTRMA000220	1.49	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
170868	WTRMA000220	8.40	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
170882	WTRMA000220	17.66	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
170896	WTRMA000220	0.04	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
170910	WTRMA000220	9.70	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
170924	WTRMA000220	3.56	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
170938	WTRMA000220	13.10	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
170982	WTRMA000220	9.34	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171011	WTRMA000220	8.13	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171025	WTRMA000220	1.81	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171039	WTRMA000223	12.47	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171053	WTRMA000223	3.66	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171089	WTRMA000223	18.10	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171104	WTRMA000223	7.23	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171117	WTRMA000223	9.27	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171131	WTRMA000223	18.13	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171132	WTRMA000223	9.71	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171148	WTRMA000220	12.44	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171153	WTRMA000220	15.36	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171154	WTRMA000220	3.04	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171160	WTRMA000220	7.35	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171165	WTRMA000220	13.85	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171166	WTRMA000220	2.61	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171171	WTRMA000223	12.90	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171172	WTRMA000223	13.09	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
171183	WTRMA0003039	40.15	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
171184	WTRMA0003039	4.07	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
171205	WTRMA000177	33.71	PVC	200	1984		0	0	SF - Residential	1	6	1	0	8
171206	WTRMA000177	40.23	PVC	200	1984		0	0	SF - Residential	1	6	1	0	8
171219	WTRMA000176	1.73	PVC	200	1984		0	0	SF - Residential	1	6	1	0	8
171220	WTRMA000176	23.84	PVC	200	1984		0	0	SF - Residential	1	6	1	0	8
171231	WTRMA000503	82.63	AC	250	1975		0	0	Commercial	8	8	3	0	19
171232	WTRMA000503	2.50	AC	250	1975		0	0	Commercial	8	8	3	0	19
171253	WTRMA000232	44.44	PVC	250	1989		0	0	Commercial	8	4	1	0	13
171254	WTRMA000232	24.26	PVC	250	1989		0	0	SF - Residential	1	4	1	0	6
171267	WTRMA005535	4.81	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
171268	WTRMA005535	18.95	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
171281	WTRMA0002078	57.30	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
171295	WTRMA0002078	86.16	AC	250	1977		0	0	SF - Residential	1	6	3	10	20
171296	WTRMA0002078	10.86	AC	250	1977		0	0	SF - Residential	1	6	3	0	10
171309	WTRMA000159	0.26	PVC	150	1984		0	0	SF - Residential	1	6	1	0	8
171310	WTRMA000159	14.34	PVC	150	1984		0	0	SF - Residential	1	6	1	0	8
171324	WTRMA000158	7.09	PVC	150	1984		0	0	SF - Residential	1	6	1	0	8
171351	WTRMA000158	9.36	PVC	150	1984		0	0	SF - Residential	1	6	1	0	8
171352	WTRMA000158	11.63	PVC	150	1984		0	0	SF - Residential	1	6	1	0	8
171366	WTRMA000158	5.05	PVC	150	1984		0	0	SF - Residential	1	6	1	0	8
171380	WTRMA000158	1.94	PVC	150	1984		0	0	SF - Residential	1	6	1	0	8
171394	WTRMA000158	14.88	PVC	150	1984		0	0	SF - Residential	1	6	1	0	8
171407	WTRMA000158	23.90	PVC	150	1984		0	0	SF - Residential	1	6	1	0	8
171408	WTRMA000158	11.65	PVC	150	1984		0	0	SF - Residential	1	6	1	0	8
171421	WTRMA004338	9.28	CI	150	1948		0	0	Commercial & SF - Residential	8	12	10	10	40
171422	WTRMA004338	6.54	CI	150	1948		0	0	Commercial & SF - Residential	8	12	10	10	40
171435	WTRMA000721	3.97	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
171449	WTRMA000721	14.22	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
171463	WTRMA000721	13.45	CI	150	1948		1	6	SF - Residential	1	12	10	0	29
171477	WTRMA000721	13.85	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
171491	WTRMA000721	13.13	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
171505	WTRMA000721	13.78	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
171519	WTRMA000721	13.41	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
171520	WTRMA000721	1.23	CI	150	1948		0	0	SF - Residential	1	12	10	0	23
171533	WTRMA000273	5.48	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171632	WTRMA000273	8.09	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171645	WTRMA000273	6.00	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171646	WTRMA000273	4.29	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171659	WTRMA000273	8.97	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171660	WTRMA000273	4.04	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171681	WTRMA000273	8.62	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171682	WTRMA000273	5.98	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171695	WTRMA000273	9.83	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171696	WTRMA000273	3.59	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171718	WTRMA000273	5.29	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171740	WTRMA000265	49.80	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171837	WTRMA000265	5.92	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171849	WTRMA000265	11.82	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171850	WTRMA000265	9.60	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171881	WTRMA000265	4.24	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171882	WTRMA000265	5.68	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171903	WTRMA000265	15.05	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171904	WTRMA000265	5.93	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
171917	WTRMA000265	9.65	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171918	WTRMA000265	9.36	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171940	WTRMA000265	4.35	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171947	WTRMA000273	9.21	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171948	WTRMA000273	4.71	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171953	WTRMA000273	3.56	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171954	WTRMA000273	3.67	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171959	WTRMA000273	8.72	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171960	WTRMA000273	5.02	PVC	250	1990		0	0	Commercial	8	4	1	0	13
171965	WTRMA000265	2.07	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171966	WTRMA000265	11.57	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171971	WTRMA000265	10.49	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171972	WTRMA000265	3.44	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171977	WTRMA000265	10.48	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171978	WTRMA000265	8.93	PVC	200	1990		0	0	SF - Residential	1	4	1	0	6
171987	WTRMA003305	15.03	PVC	250	2003		0	0	Commercial	8	2	1	0	11
171988	WTRMA003305	102.55	PVC	250	2003		0	0	Commercial	8	2	1	0	11
172025	WTRMA000124	5.00	AC	200	1982		0	0	Industrial	7	6	3	0	16
172026	WTRMA000124	92.88	AC	200	1982		0	0	Industrial	7	6	3	0	16
172038	WTRMA000180	1.55	PVC	200	1985		0	0	Commercial	8	6	1	0	15
172052	WTRMA000180	141.11	PVC	200	1985		0	0	Commercial	8	6	1	0	15
172053	WTRMA000180	23.37	PVC	200	1985		0	0	Commercial	8	6	1	0	15
172066	WTRMA000190	12.50	PVC	200	1985		0	0	Commercial	8	6	1	0	15
172067	WTRMA000190	90.06	PVC	200	1985		0	0	Commercial	8	6	1	0	15
172089	WTRMA005669	20.70	PVC	250	2009		0	0	Commercial	8	0	1	0	9
172103	WTRMA005669	5.60	PVC	250	2009		0	0	Commercial	8	0	1	0	9
172125	WTRMA005670	17.52	PVC	250	2009		0	0	Commercial	8	0	1	0	9
172137	WTRMA005669	54.17	PVC	250	2009		0	0	Commercial	8	0	1	0	9
172151	WTRMA005171	19.18	PVC	150	2006		0	0	Parks, open space and trails	1	0	1	0	2
172152	WTRMA005171	3.31	PVC	150	2006		0	0	Parks, open space and trails	1	0	1	0	2
172165	WTRMA005172	8.69	PVC	150	2006		0	0	Parks, open space and trails	1	0	1	0	2
172166	WTRMA005172	22.22	PVC	150	2006		0	0	Parks, open space and trails	1	0	1	0	2
172179	WTRMA005161	22.50	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172193	WTRMA005161	9.09	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172207	WTRMA005161	10.17	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172221	WTRMA005161	9.23	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172244	WTRMA005161	13.65	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172257	WTRMA005160	3.51	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172258	WTRMA005160	9.57	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172271	WTRMA005163	0.99	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172293	WTRMA005163	19.78	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172307	WTRMA005163	6.67	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172343	WTRMA005163	10.95	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172371	WTRMA005163	9.60	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172385	WTRMA005163	12.63	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172413	WTRMA005163	10.81	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172427	WTRMA005163	11.74	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172428	WTRMA005163	4.90	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172442	WTRMA005164	5.36	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172456	WTRMA005164	12.46	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172470	WTRMA005164	8.33	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172483	WTRMA005164	1.49	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172497	WTRMA005164	8.26	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172498	WTRMA005164	2.24	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172519	WTRMA005163	1.85	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172520	WTRMA005163	8.61	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
172533	WTRMA005163	10.73	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172534	WTRMA005163	0.58	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172548	WTRMA005163	2.65	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172556	WTRMA005161	13.14	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172557	WTRMA005161	11.56	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172565	WTRMA005163	9.76	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172566	WTRMA005163	7.54	PE	50	2006		0	0	Parks, open space and trails	1	0	1	0	2
172592	WTRMA001590	0.30	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172606	WTRMA001590	0.51	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172607	WTRMA001590	1.12	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172629	WTRMA001590	10.33	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172650	WTRMA001590	3.42	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172651	WTRMA001590	4.57	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172664	WTRMA001590	4.61	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172665	WTRMA001590	2.25	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172679	WTRMA001594	2.66	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172692	WTRMA001594	3.37	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172693	WTRMA001594	0.30	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172707	WTRMA001595	1.65	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172719	WTRMA001595	0.30	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172748	WTRMA001595	9.36	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172749	WTRMA001595	0.30	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172762	WTRMA001595	7.35	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172763	WTRMA001595	16.88	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
172776	WTRMA003228	64.28	AC	400	1983		0	0	Institutional	15	6	3	0	24
172777	WTRMA003228	32.61	AC	400	1983		0	0	Institutional	15	6	3	0	24
172790	WTRMA003222	9.59	AC	400	1983		0	0	Institutional	15	6	3	0	24
172791	WTRMA003222	72.64	AC	400	1983		0	0	Institutional	15	6	3	0	24
172804	WTRMA003219	5.60	AC	400	1983		0	0	Institutional	15	6	3	0	24
172805	WTRMA003219	11.46	AC	400	1983		0	0	Institutional	15	6	3	0	24
172819	WTRMA001282	1.51	PVC	400	1985		0	0	Institutional	15	6	1	0	22
172832	WTRMA001282	6.50	PVC	400	1985		0	0	Institutional	15	6	1	0	22
172833	WTRMA001282	12.99	PVC	400	1985		0	0	Institutional	15	6	1	0	22
172846	WTRMA001285	7.59	PVC	400	1985		0	0	Institutional	15	6	1	0	22
172860	WTRMA001285	15.13	PVC	400	1985		0	0	Institutional	15	6	1	0	22
172874	WTRMA001285	14.47	PVC	400	1985		0	0	Institutional	15	6	1	0	22
172888	WTRMA001285	14.46	PVC	400	1985		0	0	Institutional	15	6	1	0	22
172924	WTRMA001285	14.47	PVC	400	1985		0	0	Institutional	15	6	1	0	22
172925	WTRMA001285	4.93	PVC	400	1985		0	0	Institutional	15	6	1	0	22
172938	WTRMA001288	5.54	PVC	400	1985		0	0	Institutional	15	6	1	0	22
172939	WTRMA001288	7.58	PVC	400	1985		0	0	Institutional	15	6	1	0	22
172953	WTRMA001291	6.29	PVC	400	1985		0	0	Institutional	15	6	1	0	22
172989	WTRMA001291	12.98	PVC	400	1985		0	0	Institutional	15	6	1	0	22
173003	WTRMA001291	12.99	PVC	400	1985		0	0	Institutional	15	6	1	0	22
173017	WTRMA001291	12.97	PVC	400	1985		0	0	Institutional	15	6	1	0	22
173030	WTRMA001291	4.60	PVC	400	1985		0	0	Institutional	15	6	1	0	22
173031	WTRMA001291	12.98	PVC	400	1985		0	0	Institutional	15	6	1	0	22
173044	WTRMA001294	1.81	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
173045	WTRMA001294	1.88	PVC	400	1985		0	0	Institutional	15	6	1	0	22
173053	WTRMA001291	12.96	PVC	400	1985		0	0	Institutional	15	6	1	0	22
173054	WTRMA001291	13.01	PVC	400	1985		0	0	Institutional	15	6	1	0	22
173061	WTRMA001285	14.43	PVC	400	1985		0	0	Institutional	15	6	1	0	22
173062	WTRMA001285	14.50	PVC	400	1985		0	0	Institutional	15	6	1	0	22
173074	WTRMA000146	96.47	AC	200	1982		0	0	Industrial	7	6	3	5	21
173075	WTRMA000146	12.70	AC	200	1982		0	0	Industrial	7	6	3	0	16
173088	WTRMA005565	24.70	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
173089	WTRMA005565	17.91	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
173110	WTRMA001220	17.01	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
173132	WTRMA001220	5.35	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
173154	WTRMA001220	1.46	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
173155	WTRMA001220	1.09	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
173177	WTRMA001221	8.17	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
173189	WTRMA001221	0.30	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
173205	WTRMA005562	13.47	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
173224	WTRMA005564	6.58	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
173225	WTRMA005564	38.90	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
173241	WTRMA005563	7.80	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
173263	WTRMA005563	12.47	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
173276	WTRMA005563	18.66	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
173277	WTRMA005563	0.30	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
173302	WTRMA005561	7.44	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
173303	WTRMA005561	0.32	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
173318	WTRMA005562	15.87	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
173319	WTRMA005562	19.51	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
173341	WTRMA005561	11.77	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
173354	WTRMA005561	9.62	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
173355	WTRMA005561	0.30	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
173368	WTRMA001221	2.91	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
173369	WTRMA001221	22.43	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
173382	WTRMA001255	2.16	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173383	WTRMA001255	26.02	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173396	WTRMA001258	1.92	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173397	WTRMA001258	1.53	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173410	WTRMA001251	10.19	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173411	WTRMA001251	3.67	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173424	WTRMA001239	0.12	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173425	WTRMA001239	3.62	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173446	WTRMA001240	21.65	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
173447	WTRMA001240	1.97	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173460	WTRMA001243	6.64	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173461	WTRMA001243	4.00	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173474	WTRMA001244	17.83	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173488	WTRMA001244	0.31	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173489	WTRMA001244	7.03	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173502	WTRMA001244	0.13	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173503	WTRMA001244	11.01	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173517	WTRMA001244	17.81	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173529	WTRMA001244	0.30	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173544	WTRMA001244	5.07	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173545	WTRMA001244	5.32	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173558	WTRMA001249	25.96	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173559	WTRMA001249	2.06	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
173586	WTRMA001058	1.22	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173587	WTRMA001058	1.06	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173601	WTRMA001058	2.17	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173615	WTRMA001058	13.73	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173628	WTRMA001058	7.39	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173629	WTRMA001058	13.42	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173643	WTRMA001057	0.99	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173657	WTRMA001057	4.33	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173668	WTRMA001057	8.01	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173669	WTRMA001057	16.19	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173684	WTRMA001054	2.89	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173698	WTRMA001054	5.19	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173712	WTRMA001054	16.99	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173713	WTRMA001054	16.71	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173726	WTRMA001053	2.00	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173727	WTRMA001053	4.50	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173740	WTRMA001052	5.79	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173741	WTRMA001052	7.68	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173755	WTRMA001051	14.51	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173769	WTRMA001051	10.05	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173783	WTRMA001051	15.18	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173796	WTRMA001051	13.23	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173797	WTRMA001051	15.01	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173810	WTRMA001050	4.80	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173811	WTRMA001050	1.70	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173825	WTRMA001049	10.90	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173839	WTRMA001049	15.18	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173852	WTRMA001049	4.24	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173853	WTRMA001049	15.16	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173867	WTRMA001048	11.99	AC	150	1983		0	0	SF - Residential	1	6	3	0	10
173880	WTRMA001048	6.26	AC	150	1983		0	0	SF - Residential	1	6	3	0	10
173881	WTRMA001048	16.00	AC	150	1983		0	0	SF - Residential	1	6	3	0	10
173895	WTRMA001022	11.29	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173909	WTRMA001022	1.60	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173923	WTRMA001022	11.46	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173937	WTRMA001022	5.00	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173959	WTRMA001022	24.24	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173981	WTRMA001022	15.90	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173994	WTRMA001022	10.70	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
173995	WTRMA001022	0.19	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174009	WTRMA001019	4.78	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174023	WTRMA001019	5.33	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174037	WTRMA001019	17.77	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174051	WTRMA001019	4.19	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174065	WTRMA001019	15.37	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174078	WTRMA001019	25.99	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174079	WTRMA001019	12.64	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174121	WTRMA001010	4.90	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174134	WTRMA001010	8.76	AC	150	1984		0	0	SF - Residential	1	6	3	10	20
174148	WTRMA001010	0.68	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174162	WTRMA001010	5.85	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174163	WTRMA001010	1.82	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174190	WTRMA001044	18.10	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
174204	WTRMA001047	8.43	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
174205	WTRMA001047	2.69	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
174219	WTRMA001044	5.21	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
174232	WTRMA001036	2.54	AC	200	1980		0	0	SF - Residential	1	6	3	5	15
174246	WTRMA001036	10.50	AC	200	1980		0	0	SF - Residential	1	6	3	5	15
174260	WTRMA001036	3.47	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
174261	WTRMA001036	70.17	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
174275	WTRMA001013	2.46	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174289	WTRMA001013	2.20	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174333	WTRMA001013	0.05	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174347	WTRMA001013	11.70	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174361	WTRMA001013	2.01	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174375	WTRMA001013	12.53	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174389	WTRMA001013	9.60	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174402	WTRMA001013	2.46	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174425	WTRMA001013	0.75	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174439	WTRMA001013	0.99	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174453	WTRMA001013	0.76	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174466	WTRMA001013	0.40	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174467	WTRMA001013	0.40	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174476	WTRMA001013	12.02	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174483	WTRMA001013	0.43	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174484	WTRMA001013	9.79	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
174503	WTRMA008973	3.00	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174523	WTRMA008978	14.13	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174528	WTRMA008974	6.62	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174529	WTRMA008974	2.44	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174535	WTRMA008977	1.64	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174547	WTRMA004520	0.65	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174548	WTRMA004520	12.64	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174550	WTRMA008977	3.02	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
174568	WTRMA004521	16.64	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174569	WTRMA004521	8.47	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174582	WTRMA004520	0.60	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174583	WTRMA004520	10.78	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174596	WTRMA004519	0.42	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174597	WTRMA004519	9.45	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174610	WTRMA004515	19.02	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174624	WTRMA004515	15.22	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174638	WTRMA004515	0.43	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174639	WTRMA004515	4.02	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174658	WTRMA005514	24.89	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174659	WTRMA005514	0.58	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174673	WTRMA004515	24.88	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174693	WTRMA005514	8.17	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174707	WTRMA005514	0.56	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174720	WTRMA005514	4.84	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174721	WTRMA005514	20.19	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174741	WTRMA004525	10.26	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174754	WTRMA004525	9.63	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174755	WTRMA004525	0.66	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174804	WTRMA004511	0.01	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174832	WTRMA004511	12.80	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174833	WTRMA004511	19.98	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
174922	WTRMA004527	50.41	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
174923	WTRMA004527	26.30	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
174939	WTRMA008977	28.74	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174953	WTRMA008977	0.83	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174954	WTRMA008977	0.84	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174960	WTRMA008977	1.21	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174967	WTRMA008977	30.04	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174981	WTRMA008977	1.77	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174982	WTRMA008977	12.79	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174988	WTRMA008387	3.34	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174989	WTRMA008387	0.99	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174995	WTRMA008387	0.65	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
174996	WTRMA008387	1.03	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
175002	WTRMA008387	26.81	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
175003	WTRMA008387	0.19	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
175008	WTRMA004511	3.97	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175009	WTRMA004511	12.61	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175014	WTRMA004515	9.33	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175015	WTRMA004515	16.18	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175032	WTRMA004542	7.21	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175033	WTRMA004542	15.49	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175046	WTRMA004542	11.43	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175047	WTRMA004542	13.25	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175060	WTRMA004543	3.48	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175074	WTRMA004544	25.35	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175075	WTRMA004544	0.81	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175088	WTRMA004544	24.77	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175089	WTRMA004544	3.42	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175102	WTRMA004547	2.96	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175116	WTRMA004547	14.27	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175130	WTRMA004547	10.62	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175131	WTRMA004547	2.46	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175151	WTRMA004549	19.58	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175170	WTRMA004549	1.12	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175184	WTRMA004549	21.43	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175185	WTRMA004549	5.39	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
175199	WTRMA004573	15.45	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175213	WTRMA004573	14.36	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175233	WTRMA004573	11.44	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175253	WTRMA004573	19.67	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175273	WTRMA004573	10.26	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175287	WTRMA004573	20.25	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175321	WTRMA004573	5.70	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175348	WTRMA004570	5.75	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175349	WTRMA004570	7.11	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175368	WTRMA004570	2.53	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175369	WTRMA004570	21.93	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175414	WTRMA004570	0.50	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175415	WTRMA004570	25.89	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175434	WTRMA004570	1.13	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175435	WTRMA004570	23.32	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175448	WTRMA004552	26.05	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175471	WTRMA004552	23.89	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175492	WTRMA004559	12.60	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175493	WTRMA004559	23.25	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175506	WTRMA004554	9.46	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175507	WTRMA004554	11.75	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175521	WTRMA004554	22.70	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175534	WTRMA004554	6.98	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175535	WTRMA004554	0.35	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175549	WTRMA004568	1.06	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175569	WTRMA004568	13.77	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175643	WTRMA004568	2.42	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175663	WTRMA004568	27.04	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175683	WTRMA004568	3.95	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175697	WTRMA004568	8.82	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175710	WTRMA004568	0.94	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175711	WTRMA004568	17.33	PVC	200	2007		0	0	SF - Residential	1	0	1	10	12
175736	WTRMA004562	21.76	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175737	WTRMA004562	10.53	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175750	WTRMA004562	14.87	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175751	WTRMA004562	0.74	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175770	WTRMA004562	4.40	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175784	WTRMA004562	16.88	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175785	WTRMA004562	4.58	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
175804	WTRMA004559	0.66	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175805	WTRMA004559	2.36	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175824	WTRMA004559	19.62	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175825	WTRMA004559	7.39	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
175853	WTRMA004751	1.66	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
175866	WTRMA004751	3.08	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
175867	WTRMA004751	6.33	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
175916	WTRMA004584	3.14	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
175930	WTRMA004584	1.96	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
175965	WTRMA004584	18.21	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
176006	WTRMA004586	0.99	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
176007	WTRMA004586	3.62	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
176027	WTRMA004586	20.81	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
176080	WTRMA004586	2.03	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
176081	WTRMA004586	18.57	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
176099	WTRMA004581	19.53	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
176108	WTRMA004581	14.92	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
176121	WTRMA004568	29.19	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
176122	WTRMA004568	3.12	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
176129	WTRMA008977	1.69	PVC	200	2011	2012	0	0	N/A	0	0	0	0	0
176130	WTRMA008977	0.22	PVC	200	2011	2012	0	0	N/A	0	0	0	0	0
176137	WTRMA008392	0.16	PVC	200	2011	2012	0	0	N/A	0	0	0	0	0
176138	WTRMA008392	27.70	PVC	200	2011	2012	0	0	N/A	0	0	0	0	0
176197	WTRMA001791	11.93	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176225	WTRMA001791	24.04	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176226	WTRMA001791	4.45	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176245	WTRMA001791	19.65	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176259	WTRMA001791	26.89	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176260	WTRMA001791	4.87	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176279	WTRMA001788	19.12	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176299	WTRMA001786	1.47	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176313	WTRMA001788	24.68	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176314	WTRMA001788	4.38	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176328	WTRMA001805	8.23	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
176341	WTRMA001805	11.39	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
176342	WTRMA001805	24.78	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
176467	WTRMA001784	13.66	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176468	WTRMA001784	53.47	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176481	WTRMA001786	62.80	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176482	WTRMA001786	14.26	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
176510	WTRMA001800	23.66	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176524	WTRMA001800	18.11	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176560	WTRMA001800	9.82	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176574	WTRMA001800	23.72	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176621	WTRMA001800	5.12	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176636	WTRMA001797	1.63	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176656	WTRMA001797	3.43	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176677	WTRMA001797	13.16	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176705	WTRMA001794	5.12	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176706	WTRMA001794	1.01	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176962	WTRMA001808	11.96	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176973	WTRMA001800	6.44	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176979	WTRMA001800	22.55	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176980	WTRMA001800	8.44	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
176991	WTRMA002262	12.68	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
176992	WTRMA002262	5.82	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177004	WTRMA002262	7.97	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177005	WTRMA002262	2.43	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177025	WTRMA002261	9.47	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177026	WTRMA002261	2.29	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177039	WTRMA002265	4.93	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177053	WTRMA002265	2.09	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177054	WTRMA002265	13.56	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177068	WTRMA002265	1.09	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177081	WTRMA002265	14.40	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177082	WTRMA002265	0.59	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177095	WTRMA002265	14.91	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177096	WTRMA002265	0.02	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177109	WTRMA002265	14.16	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177110	WTRMA002265	1.43	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177123	WTRMA002265	13.56	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177124	WTRMA002265	2.11	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
177137	WTRMA002252	9.82	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
177138	WTRMA002252	2.89	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
177151	WTRMA002242	9.58	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177165	WTRMA002242	18.79	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177166	WTRMA002242	9.29	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177179	WTRMA002243	4.56	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177180	WTRMA002243	1.15	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177191	WTRMA002243	2.85	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177192	WTRMA002243	1.74	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177208	WTRMA002249	7.52	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177221	WTRMA002249	15.51	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177222	WTRMA002249	15.50	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177236	WTRMA002249	0.85	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177250	WTRMA002249	13.35	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177264	WTRMA002249	1.69	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177278	WTRMA002249	11.01	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177311	WTRMA002249	1.29	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177312	WTRMA002249	1.11	PVC	200	1992		0	0	SF - Residential	1	4	1	0	6
177326	WTRMA002162	22.20	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177339	WTRMA002162	14.23	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177340	WTRMA002162	14.89	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177353	WTRMA002161	6.59	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177354	WTRMA002161	0.35	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177367	WTRMA002160	8.46	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177381	WTRMA002160	15.39	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177395	WTRMA002160	14.69	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
177396	WTRMA002160	11.32	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177410	WTRMA002157	3.78	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177424	WTRMA002157	13.83	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177438	WTRMA002157	13.80	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177451	WTRMA002157	14.63	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177452	WTRMA002157	13.99	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177466	WTRMA002155	7.78	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177480	WTRMA002155	15.79	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177502	WTRMA002073	9.39	AC	200	1977		0	0	SF - Residential	1	6	3	0	10
177516	WTRMA002073	15.27	AC	200	1977		0	0	SF - Residential	1	6	3	0	10
177529	WTRMA002073	39.29	AC	200	1977		0	0	Institutional	10	6	3	0	19
177530	WTRMA002073	15.84	AC	200	1977		0	0	SF - Residential	1	6	3	0	10
177543	WTRMA002164	19.94	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177557	WTRMA002164	12.51	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177571	WTRMA002164	12.75	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177603	WTRMA002164	13.43	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177623	WTRMA002164	12.96	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177643	WTRMA002164	11.98	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177657	WTRMA002164	7.41	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177701	WTRMA002164	1.14	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177716	WTRMA002164	5.14	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177721	WTRMA002164	1.12	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177722	WTRMA002164	1.22	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177727	WTRMA002155	7.94	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177728	WTRMA002155	15.51	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177740	WTRMA002095	11.86	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
177753	WTRMA002095	9.36	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
177754	WTRMA002095	15.48	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
177768	WTRMA002127	6.58	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177782	WTRMA002127	16.59	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177795	WTRMA002127	3.49	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177796	WTRMA002127	16.80	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
177810	WTRMA002128	13.55	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177824	WTRMA002128	15.59	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177838	WTRMA002128	17.19	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177852	WTRMA002128	16.60	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177865	WTRMA002128	4.77	PVC	150	1985		0	0	SF - Residential	1	6	1	5	13
177866	WTRMA002128	16.69	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177879	WTRMA002132	8.39	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177880	WTRMA002132	5.38	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177894	WTRMA002133	8.10	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177908	WTRMA002133	16.59	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177922	WTRMA002133	15.99	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177936	WTRMA002133	15.12	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177949	WTRMA002133	3.68	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177950	WTRMA002133	8.08	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177977	WTRMA002141	18.69	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
177978	WTRMA002141	8.57	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178029	WTRMA002141	0.69	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178051	WTRMA002141	2.62	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178052	WTRMA002141	1.76	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178074	WTRMA002141	16.67	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178087	WTRMA002143	10.50	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178129	WTRMA002143	17.89	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178143	WTRMA002146	5.18	PVC	150	1985		0	0	SF - Residential	1	6	1	5	13
178173	WTRMA002143	16.94	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178174	WTRMA002143	0.80	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178187	WTRMA002143	1.40	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178188	WTRMA002143	11.02	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178245	WTRMA002146	7.40	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178246	WTRMA002146	12.49	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178259	WTRMA002146	5.70	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178295	WTRMA002146	12.14	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178309	WTRMA002146	14.43	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178310	WTRMA002146	4.58	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178324	WTRMA002152	2.14	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178338	WTRMA002152	11.98	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178352	WTRMA002152	18.45	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178365	WTRMA002152	9.73	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178366	WTRMA002152	18.69	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178379	WTRMA002153	3.11	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178380	WTRMA002153	10.81	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178393	WTRMA002154	7.59	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178407	WTRMA002154	8.57	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178433	WTRMA002154	17.42	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178434	WTRMA002154	0.64	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178449	WTRMA002154	16.09	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178477	WTRMA002154	4.08	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178478	WTRMA002154	12.98	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178491	WTRMA002154	5.91	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178505	WTRMA002154	17.94	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178519	WTRMA002154	15.92	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178533	WTRMA002154	14.72	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178547	WTRMA002154	5.49	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178548	WTRMA002154	0.54	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178562	WTRMA002139	4.86	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178576	WTRMA002139	13.54	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178603	WTRMA002139	11.23	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178604	WTRMA002139	4.12	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178645	WTRMA002135	20.89	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178646	WTRMA002135	3.19	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178668	WTRMA002139	9.11	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178681	WTRMA002139	7.81	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178696	WTRMA002139	8.36	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178733	WTRMA002135	2.59	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178734	WTRMA002135	13.46	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178748	WTRMA002134	6.44	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178762	WTRMA002134	13.79	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
178775	WTRMA002134	8.34	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178776	WTRMA002134	13.14	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178783	WTRMA002146	12.39	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178784	WTRMA002146	4.52	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178790	WTRMA002146	9.39	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178795	WTRMA002141	1.94	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178801	WTRMA002141	12.90	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178802	WTRMA002141	2.40	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178808	WTRMA002135	1.62	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
178819	WTRMA001624	6.30	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178820	WTRMA001624	4.67	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178833	WTRMA001603	7.24	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178834	WTRMA001603	0.47	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178847	WTRMA001606	7.91	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178861	WTRMA001606	7.05	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178862	WTRMA001606	8.34	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178875	WTRMA001606	6.67	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178876	WTRMA001606	9.14	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178889	WTRMA001606	9.62	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178903	WTRMA001606	5.69	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178925	WTRMA001606	9.88	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178940	WTRMA001606	41.15	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178947	WTRMA001606	5.14	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178948	WTRMA001606	10.92	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
178959	WTRMA001686	5.66	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
178960	WTRMA001686	6.77	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
178987	WTRMA001817	25.99	PVC	400	2001		0	0	Institutional	15	2	1	0	18
179007	WTRMA001817	25.99	PVC	400	2001		0	0	Institutional	15	2	1	0	18
179035	WTRMA001817	26.99	PVC	400	2001		0	0	Institutional	15	2	1	0	18
179036	WTRMA001817	10.00	PVC	400	2001		0	0	Institutional	15	2	1	0	18
179049	WTRMA004148	22.59	AC	150	1968		0	0	Commercial	8	8	3	0	19
179050	WTRMA004148	77.82	AC	150	1968		1	6	Commercial	8	8	3	0	25
179063	WTRMA005406	48.64	AC	250	1970		0	0	SF - Residential	1	8	3	0	12
179064	WTRMA005406	140.15	AC	250	1970		0	0	SF - Residential	1	8	3	0	12
179077	WTRMA002347	42.47	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
179078	WTRMA002347	95.69	AC	150	1973		0	0	SF - Residential	1	8	3	0	12
179091	WTRMA004315	102.20	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
179105	WTRMA004315	1.75	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
179106	WTRMA004315	40.23	AC	150	1972		0	0	SF - Residential	1	8	3	0	12
179127	WTRMA002640	15.75	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
179128	WTRMA002640	1.94	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
179141	WTRMA002640	1.54	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
179142	WTRMA002640	4.92	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
179166	WTRMA000903	2.04	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
179167	WTRMA000903	7.49	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
179180	WTRMA000903	0.50	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
179181	WTRMA000903	27.65	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
179202	WTRMA000903	0.50	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
179203	WTRMA000903	26.96	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
179210	WTRMA000903	18.12	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
179211	WTRMA000903	3.04	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
179223	WTRMA001493	21.99	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179237	WTRMA001493	1.75	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179238	WTRMA001493	4.36	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179249	WTRMA001454	38.20	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
179250	WTRMA001454	4.90	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
179266	WTRMA001540	0.77	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179279	WTRMA001540	1.24	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179280	WTRMA001540	1.30	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179294	WTRMA001540	2.07	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179307	WTRMA001540	0.30	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179308	WTRMA001540	25.69	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179321	WTRMA001533	35.53	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179322	WTRMA001533	10.05	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179335	WTRMA001539	3.90	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179349	WTRMA001539	3.70	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179350	WTRMA001539	2.43	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179384	WTRMA001527	5.51	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179403	WTRMA001527	1.91	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179404	WTRMA001527	23.96	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179431	WTRMA001527	29.06	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179432	WTRMA001527	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179446	WTRMA001527	25.94	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179459	WTRMA001527	4.06	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179460	WTRMA001527	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179474	WTRMA001527	2.07	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179487	WTRMA001527	9.99	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179488	WTRMA001527	0.42	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179502	WTRMA001526	17.32	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179515	WTRMA001523	20.11	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179516	WTRMA001523	7.76	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179529	WTRMA001523	4.42	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179530	WTRMA001523	0.41	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179544	WTRMA001528	2.26	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179558	WTRMA001528	2.29	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179571	WTRMA001528	3.76	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179572	WTRMA001528	10.75	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
179586	WTRMA001520	22.75	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
179599	WTRMA001520	4.85	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
179600	WTRMA001520	0.50	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
179613	WTRMA001520	1.37	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
179614	WTRMA001520	1.93	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
179627	WTRMA001509	19.10	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
179628	WTRMA001509	2.21	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
179649	WTRMA001465	5.66	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179650	WTRMA001465	11.93	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179663	WTRMA001465	24.78	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179677	WTRMA001465	0.25	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
179678	WTRMA001465	2.34	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179691	WTRMA001465	12.26	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179692	WTRMA001465	1.95	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179713	WTRMA001447	6.80	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
179714	WTRMA001447	6.06	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
179725	WTRMA001442	17.45	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
179726	WTRMA001442	23.62	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
179742	WTRMA001466	16.33	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
179775	WTRMA001466	5.18	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
179776	WTRMA001466	0.60	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
179789	WTRMA001466	2.90	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
179790	WTRMA001466	23.07	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
179803	WTRMA001472	0.81	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179804	WTRMA001472	0.90	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179817	WTRMA001472	19.39	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179818	WTRMA001472	10.21	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179831	WTRMA001472	8.13	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179832	WTRMA001472	9.55	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179845	WTRMA001475	39.44	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179859	WTRMA001475	8.24	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179860	WTRMA001475	3.38	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179873	WTRMA001478	20.04	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179874	WTRMA001478	4.34	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179887	WTRMA001478	12.41	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179901	WTRMA001478	0.40	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179902	WTRMA001478	17.56	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179915	WTRMA001480	1.87	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179916	WTRMA001480	10.17	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179929	WTRMA001479	2.89	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179930	WTRMA001479	0.19	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179943	WTRMA001480	12.85	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179957	WTRMA001480	2.09	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179958	WTRMA001480	25.82	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179966	WTRMA001493	2.01	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179971	WTRMA001493	29.04	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179972	WTRMA001493	31.00	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
179983	WTRMA000900	20.49	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
179997	WTRMA000900	0.50	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
179998	WTRMA000900	10.91	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
180012	WTRMA000889	36.60	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
180049	WTRMA002604	15.75	PVC	250	1985		0	0	SF - Residential	1	6	3	0	8
180050	WTRMA002604	27.50	PVC	250	1985		0	0	SF - Residential	1	6	3	0	8
180057	WTRMA002487	16.17	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
180091	WTRMA002429	6.37	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180105	WTRMA002429	9.03	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180149	WTRMA002429	10.80	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180210	WTRMA002429	2.30	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180223	WTRMA002429	17.57	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180237	WTRMA002429	24.25	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180238	WTRMA002429	18.48	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180251	WTRMA002432	5.59	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180252	WTRMA002432	7.55	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180271	WTRMA002433	1.19	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180272	WTRMA002433	10.91	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180285	WTRMA002431	7.64	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180300	WTRMA002431	1.05	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180314	WTRMA002431	2.77	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180327	WTRMA002431	1.42	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180328	WTRMA002431	1.52	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180341	WTRMA002438	0.48	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180353	WTRMA002438	11.40	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180354	WTRMA002438	18.52	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180370	WTRMA002442	11.73	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180384	WTRMA002442	17.00	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180397	WTRMA002442	0.92	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180398	WTRMA002442	17.79	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180438	WTRMA005521	1.30	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180460	WTRMA005521	3.29	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180473	WTRMA005521	5.88	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180474	WTRMA005521	6.93	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180489	WTRMA005521	6.64	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180490	WTRMA005521	10.43	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180503	WTRMA002439	8.63	AC	150	1980		0	0	SF - Residential	1	6	3	5	15
180539	WTRMA002439	16.20	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180540	WTRMA002439	12.62	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180584	WTRMA002363	11.96	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180611	WTRMA002363	0.34	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180612	WTRMA002363	17.32	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180626	WTRMA002363	16.52	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180653	WTRMA002363	0.83	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180654	WTRMA002363	3.04	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180667	WTRMA002407	6.57	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
180726	WTRMA002407	5.02	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
180739	WTRMA002407	13.25	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
180775	WTRMA002407	3.55	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
180776	WTRMA002407	26.12	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
180790	WTRMA002407	16.65	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
180803	WTRMA002407	6.54	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
180853	WTRMA002399	9.07	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
180854	WTRMA002399	7.46	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
180868	WTRMA002399	16.67	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
180882	WTRMA002399	0.39	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
180909	WTRMA002399	0.77	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
180910	WTRMA002399	19.09	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
180923	WTRMA002399	18.12	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
180924	WTRMA002399	29.96	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
180979	WTRMA002412	4.77	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
180980	WTRMA002412	1.68	AC	150	1980		0	0	SF - Residential	1	6	3	0	10

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
181002	WTRMA002417	36.98	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181016	WTRMA002417	19.29	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181030	WTRMA002417	7.91	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181043	WTRMA002417	13.59	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181044	WTRMA002417	11.90	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181071	WTRMA002418	7.50	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181072	WTRMA002418	0.71	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181107	WTRMA002418	11.10	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181108	WTRMA002418	7.78	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181121	WTRMA002419	8.15	AC	300	1981		0	0	SF - Residential	1	6	3	0	10
181149	WTRMA002419	6.72	AC	300	1981		0	0	SF - Residential	1	6	3	0	10
181150	WTRMA002419	14.12	AC	300	1981		0	0	SF - Residential	1	6	3	0	10
181163	WTRMA002419	9.04	AC	300	1981		0	0	SF - Residential	1	6	3	0	10
181164	WTRMA002419	16.20	AC	300	1981		0	0	SF - Residential	1	6	3	0	10
181175	WTRMA003978	6.76	AC	200	1981	1988	0	0	N/A	0	0	0	0	0
181176	WTRMA003978	8.80	AC	200	1981	1988	0	0	N/A	0	0	0	0	0
181199	WTRMA002422	6.40	AC	200	1981		0	0	SF - Residential	1	6	3	0	10
181200	WTRMA002422	14.81	AC	200	1981		0	0	SF - Residential	1	6	3	0	10
181213	WTRMA002477	19.40	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
181227	WTRMA002477	13.05	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
181241	WTRMA002477	6.40	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
181255	WTRMA002477	18.89	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
181256	WTRMA002477	9.54	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
181313	WTRMA005527	3.36	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
181314	WTRMA005527	7.67	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
181333	WTRMA002482	8.95	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
181347	WTRMA002482	15.49	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
181348	WTRMA002482	14.14	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
181361	WTRMA002482	13.02	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
181362	WTRMA002482	4.83	PVC	150	1988		0	0	SF - Residential	1	4	1	0	6
181375	WTRMA002493	1.73	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
181376	WTRMA002493	2.26	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
181389	WTRMA002493	1.20	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
181390	WTRMA002493	0.89	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
181403	WTRMA002493	1.66	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
181404	WTRMA002493	0.24	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
181417	WTRMA002487	31.71	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
181418	WTRMA002487	23.46	PVC	150	1991		0	0	SF - Residential	1	4	1	0	6
181425	WTRMA002363	3.15	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181426	WTRMA002363	11.44	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181431	WTRMA002429	6.78	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181432	WTRMA002429	6.00	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181438	WTRMA002429	8.00	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181444	WTRMA002429	9.30	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181445	WTRMA002429	6.60	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181450	WTRMA002429	5.50	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181456	WTRMA002429	12.20	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181462	WTRMA002429	3.30	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181468	WTRMA002429	9.10	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181469	WTRMA002429	6.30	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181480	WTRMA005521	6.81	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181481	WTRMA005521	1.75	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181486	WTRMA002439	21.93	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181487	WTRMA002439	13.10	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181492	WTRMA002407	15.60	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181493	WTRMA002407	17.57	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181498	WTRMA002407	2.63	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181499	WTRMA002407	14.97	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181504	WTRMA002407	12.25	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181505	WTRMA002407	8.13	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
181510	WTRMA002399	15.58	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
181511	WTRMA002399	16.09	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
181516	WTRMA002412	2.32	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181517	WTRMA002412	11.52	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181522	WTRMA002412	0.64	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181523	WTRMA002412	0.58	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
181533	WTRMA003655	28.66	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
181534	WTRMA003655	2.92	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
181545	WTRMA003644	12.95	PVC	400	2005		0	0	Commercial	13	2	1	0	16
181546	WTRMA003644	44.14	PVC	400	2005		0	0	Commercial	13	2	1	0	16
181564	WTRMA001010	10.52	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
181565	WTRMA001010	3.99	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
181578	WTRMA001010	13.99	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
181579	WTRMA001010	4.20	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
181592	WTRMA001011	9.98	AC	150	1984		0	0	SF - Residential	1	6	3	5	15
181593	WTRMA001011	3.50	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
181606	WTRMA001012	12.91	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
181642	WTRMA001012	15.17	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
181656	WTRMA001012	11.76	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
181657	WTRMA001012	2.67	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
181670	WTRMA001044	8.70	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
181684	WTRMA001044	23.30	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
181706	WTRMA001044	21.68	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
181720	WTRMA001044	0.70	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
181749	WTRMA001044	14.30	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
181762	WTRMA001249	4.26	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
181763	WTRMA001249	21.22	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
181774	WTRMA001250	3.44	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
181775	WTRMA001250	2.25	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
181790	WTRMA001268	3.05	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
181791	WTRMA001268	10.82	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
181804	WTRMA001265	2.14	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
181805	WTRMA001265	3.44	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
181818	WTRMA001264	2.61	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
181819	WTRMA001264	2.25	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
181833	WTRMA001260	21.10	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
181846	WTRMA001260	1.23	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
181847	WTRMA001260	0.34	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
181860	WTRMA001234	2.71	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
181861	WTRMA001234	0.44	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
181874	WTRMA001234	0.58	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
181888	WTRMA001234	25.68	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
181902	WTRMA001234	0.30	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
181903	WTRMA001234	7.20	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
181916	WTRMA005478	2.18	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
181917	WTRMA005478	10.85	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
181936	WTRMA005481	3.57	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
181962	WTRMA005481	26.18	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
181963	WTRMA005481	5.29	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
181982	WTRMA005481	23.97	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
181983	WTRMA005481	4.63	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
182010	WTRMA001226	6.33	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
182024	WTRMA001226	0.30	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
182046	WTRMA001226	4.60	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
182047	WTRMA001226	8.38	PVC	400	2003		0	0	SF - Residential	6	2	1	0	9
182054	WTRMA001012	3.29	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
182055	WTRMA001012	13.80	AC	150	1984		0	0	SF - Residential	1	6	3	0	10
182067	WTRMA001002	6.78	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182080	WTRMA001002	7.17	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182081	WTRMA001002	0.52	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182095	WTRMA001003	6.73	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182123	WTRMA001003	6.12	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182151	WTRMA001003	3.77	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182165	WTRMA001003	9.42	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182179	WTRMA001003	9.40	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182192	WTRMA001003	5.59	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182193	WTRMA001003	0.51	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182206	WTRMA000987	20.29	PVC	150	1985		0	0	SF - Residential	1	4	1	0	6
182207	WTRMA000987	10.66	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182220	WTRMA000986	1.54	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182221	WTRMA000986	11.62	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182235	WTRMA000985	9.69	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182271	WTRMA001006	12.05	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182284	WTRMA001006	2.42	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182285	WTRMA001006	5.26	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182298	WTRMA001006	0.95	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182299	WTRMA001006	4.98	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182313	WTRMA001000	4.06	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182327	WTRMA001000	6.38	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182363	WTRMA001000	11.92	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182377	WTRMA001000	10.87	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182391	WTRMA001000	12.37	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182404	WTRMA001000	3.55	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182405	WTRMA001000	10.90	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
182426	WTRMA000984	1.68	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182427	WTRMA000984	11.81	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182438	WTRMA005559	8.58	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182439	WTRMA005559	7.49	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182455	WTRMA000989	7.56	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182469	WTRMA000989	16.83	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182483	WTRMA000989	4.96	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182497	WTRMA000989	4.44	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182511	WTRMA000989	0.33	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182524	WTRMA000989	6.29	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182525	WTRMA000989	1.54	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182550	WTRMA005557	0.27	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182551	WTRMA005557	20.18	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182571	WTRMA000983	9.83	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182585	WTRMA000983	15.70	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182605	WTRMA000983	14.82	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182624	WTRMA000983	7.11	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182625	WTRMA000983	15.07	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182645	WTRMA000980	8.19	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182665	WTRMA000980	14.69	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182685	WTRMA000980	14.53	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182705	WTRMA000980	11.81	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182732	WTRMA000980	9.67	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182733	WTRMA000980	3.33	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182746	WTRMA000980	3.89	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182747	WTRMA000980	4.35	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182760	WTRMA000979	5.46	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182761	WTRMA000979	8.04	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182775	WTRMA000978	6.37	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182789	WTRMA000978	10.74	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182809	WTRMA000978	12.95	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182829	WTRMA000978	14.05	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182849	WTRMA000978	15.32	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182868	WTRMA000978	3.00	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182869	WTRMA000978	13.32	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182888	WTRMA000972	13.72	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182917	WTRMA000969	10.29	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
182953	WTRMA000969	13.03	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
182966	WTRMA000969	8.04	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
182967	WTRMA000969	7.26	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
182981	WTRMA000972	3.21	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182994	WTRMA000972	13.55	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
182995	WTRMA000972	12.59	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183042	WTRMA000966	4.24	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183064	WTRMA000969	1.27	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183065	WTRMA000969	6.67	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183114	WTRMA000966	6.84	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183115	WTRMA000966	6.92	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183128	WTRMA000966	12.08	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
183148	WTRMA000966	13.62	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183149	WTRMA000966	3.12	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183168	WTRMA004957	52.77	AC	250	1980		0	0	Institutional	10	6	3	0	19
183182	WTRMA004957	13.39	AC	250	1980		0	0	Institutional	10	6	3	0	19
183183	WTRMA004957	6.83	AC	250	1980		0	0	Institutional	10	6	3	0	19
183210	WTRMA000993	6.29	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183211	WTRMA000993	12.38	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183244	WTRMA000993	12.62	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183245	WTRMA000993	3.46	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183264	WTRMA000996	6.57	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183299	WTRMA000996	3.34	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183313	WTRMA000997	1.93	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183327	WTRMA000997	7.19	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183341	WTRMA000997	14.08	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183355	WTRMA000997	13.00	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183369	WTRMA000997	11.80	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183382	WTRMA000997	6.61	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183383	WTRMA000997	12.10	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183396	WTRMA000998	5.17	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183397	WTRMA000998	8.31	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183455	WTRMA001007	11.06	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183469	WTRMA001007	5.75	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183497	WTRMA001007	0.96	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183510	WTRMA001007	11.64	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183511	WTRMA001007	1.25	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183524	WTRMA001007	1.01	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183525	WTRMA001007	0.29	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183533	WTRMA000985	19.49	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183538	WTRMA000985	7.58	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183539	WTRMA000985	10.27	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183544	WTRMA001003	5.62	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183545	WTRMA001003	2.05	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183550	WTRMA001000	11.22	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183551	WTRMA001000	11.41	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183556	WTRMA001007	14.18	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183557	WTRMA001007	21.39	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183563	WTRMA000996	11.66	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183568	WTRMA000996	9.66	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183569	WTRMA000996	13.32	PVC	150	1986		0	0	SF - Residential	1	4	1	0	6
183574	WTRMA000969	12.39	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183575	WTRMA000969	14.32	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183580	WTRMA000969	7.64	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183581	WTRMA000969	13.08	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183586	WTRMA000966	3.70	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183592	WTRMA000966	8.90	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183593	WTRMA000966	6.12	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
183618	WTRMA001178	1.00	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183619	WTRMA001178	3.97	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183631	WTRMA001178	1.00	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183655	WTRMA001178	3.63	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183669	WTRMA001178	8.41	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183683	WTRMA001178	6.48	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183697	WTRMA001178	6.86	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183711	WTRMA001178	9.13	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183725	WTRMA001178	4.88	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183739	WTRMA001181	12.88	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183753	WTRMA001178	1.71	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183767	WTRMA001178	16.38	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183780	WTRMA001178	8.49	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183781	WTRMA001178	0.61	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183794	WTRMA001181	2.84	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183836	WTRMA001181	1.35	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183837	WTRMA001181	3.00	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183850	WTRMA001181	5.67	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183851	WTRMA001181	3.07	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183864	WTRMA001181	4.25	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183878	WTRMA001181	7.27	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183892	WTRMA001181	3.95	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183906	WTRMA001181	11.43	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183929	WTRMA001181	9.89	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
183950	WTRMA001174	11.86	AC	150	1981		0	0	SF - Residential	1	6	3	0	10
183964	WTRMA001174	1.14	AC	150	1981		0	0	SF - Residential	1	6	3	0	10
183978	WTRMA001174	16.30	AC	150	1981		0	0	SF - Residential	1	6	3	0	10
183979	WTRMA001174	9.67	AC	150	1981		0	0	SF - Residential	1	6	3	0	10
184001	WTRMA001186	4.16	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184021	WTRMA001186	14.15	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184040	WTRMA001186	7.85	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184041	WTRMA001186	15.27	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184060	WTRMA005549	5.57	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184074	WTRMA005549	5.59	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184075	WTRMA005549	2.32	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184089	WTRMA001183	7.03	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184103	WTRMA001183	3.55	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184147	WTRMA001183	0.79	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184169	WTRMA001183	11.71	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184217	WTRMA001183	14.12	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184230	WTRMA001183	1.00	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184231	WTRMA001183	1.00	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184255	WTRMA001191	1.81	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184269	WTRMA001191	2.02	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184282	WTRMA001191	15.71	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184304	WTRMA001191	2.48	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184305	WTRMA001191	1.62	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184318	WTRMA001212	2.25	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
184319	WTRMA001212	16.69	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
184339	WTRMA001212	6.59	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
184350	WTRMA001212	8.95	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
184351	WTRMA001212	0.30	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
184366	WTRMA001204	0.18	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184367	WTRMA001204	16.61	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184380	WTRMA001198	1.75	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184381	WTRMA001198	3.84	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184394	WTRMA001194	19.62	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184395	WTRMA001194	4.11	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184408	WTRMA001194	1.07	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184409	WTRMA001194	2.93	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184422	WTRMA001206	36.00	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
184436	WTRMA001206	16.33	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
184467	WTRMA001206	2.84	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
184480	WTRMA001211	5.92	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
184494	WTRMA001211	0.30	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
184495	WTRMA001211	4.87	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
184509	WTRMA001203	2.52	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184523	WTRMA001203	10.91	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184537	WTRMA001203	0.30	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184550	WTRMA001203	1.96	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184551	WTRMA001203	17.59	PVC	150	2001		0	0	SF - Residential	1	2	1	0	4
184565	WTRMA001176	34.54	AC	150	1981		1	6	SF - Residential	1	6	3	0	16
184586	WTRMA001176	15.78	AC	150	1981		0	0	SF - Residential	1	6	3	0	10
184587	WTRMA001176	2.63	AC	150	1981		0	0	SF - Residential	1	6	3	0	10
184598	WTRMA000923	28.68	PVC	200	1997		0	0	Institutional	10	2	1	0	13
184599	WTRMA000923	10.51	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184612	WTRMA000925	25.37	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184626	WTRMA000925	46.13	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184627	WTRMA000925	11.71	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184642	WTRMA000927	24.00	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184643	WTRMA000927	29.98	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184657	WTRMA000937	27.39	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184710	WTRMA000937	2.70	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184711	WTRMA000937	12.15	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184725	WTRMA000932	25.53	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184779	WTRMA000932	15.59	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184799	WTRMA000932	11.41	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184832	WTRMA000932	6.02	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184846	WTRMA001178	1.23	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
184847	WTRMA001178	1.00	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
184852	WTRMA001181	2.57	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
184853	WTRMA001181	13.99	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
184859	WTRMA001183	10.59	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184864	WTRMA001183	12.65	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184865	WTRMA001183	1.41	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184870	WTRMA001183	9.72	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184871	WTRMA001183	2.87	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184876	WTRMA001183	12.40	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184877	WTRMA001183	11.99	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184882	WTRMA001191	3.36	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184883	WTRMA001191	14.64	PVC	150	1987		0	0	SF - Residential	1	4	1	0	6
184888	WTRMA001206	3.86	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
184889	WTRMA001206	21.00	PVC	150	2002		0	0	SF - Residential	1	2	1	0	4
184894	WTRMA000932	17.40	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184895	WTRMA000932	9.59	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184900	WTRMA000932	5.41	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184901	WTRMA000932	21.58	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
184912	WTRMA004638	3.70	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
184913	WTRMA004638	8.04	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
184926	WTRMA004636	23.22	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
184927	WTRMA004636	1.85	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
184940	WTRMA004636	18.27	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
184941	WTRMA004636	5.12	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
184966	WTRMA004616	7.55	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
184967	WTRMA004616	12.59	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
184980	WTRMA004616	25.87	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
184981	WTRMA004616	3.07	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
185000	WTRMA003599	15.15	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
185001	WTRMA003599	21.68	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
185022	WTRMA003595	19.15	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
185023	WTRMA003595	12.89	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
185037	WTRMA003593	15.46	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
185110	WTRMA003593	7.95	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
185124	WTRMA003593	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
185125	WTRMA003593	21.61	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
185139	WTRMA004214	2.36	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
185153	WTRMA004214	26.27	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
185167	WTRMA004214	0.50	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
185181	WTRMA004214	26.26	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
185195	WTRMA004214	0.50	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
185209	WTRMA004214	26.26	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
185223	WTRMA004214	0.50	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
185237	WTRMA004214	26.26	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
185251	WTRMA004214	0.50	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
185265	WTRMA004214	44.75	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
185279	WTRMA004214	0.50	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
185293	WTRMA004214	27.22	AC	200	1978		0	0	Institutional	10	6	3	0	19
185306	WTRMA004214	29.13	AC	200	1978		0	0	Institutional	10	6	3	0	19
185307	WTRMA004214	0.50	AC	200	1978		0	0	Institutional	10	6	3	0	19
185320	WTRMA003602	3.74	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
185334	WTRMA003602	2.26	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
185335	WTRMA003602	38.76	PVC	250	2006		0	0	SF - Residential	1	0	1	0	2
185348	WTRMA004196	4.51	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
185362	WTRMA004192	11.44	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
185363	WTRMA004192	2.64	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
185376	WTRMA004193	2.31	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
185377	WTRMA004193	11.41	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
185390	WTRMA004193	12.97	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
185391	WTRMA004193	2.67	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
185404	WTRMA004193	2.19	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
185405	WTRMA004193	15.38	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
185418	WTRMA004193	5.85	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
185432	WTRMA004193	0.50	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
185433	WTRMA004193	13.23	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
185446	WTRMA003590	12.65	PVC	400	2006		0	0	Institutional	15	0	1	0	16
185447	WTRMA003590	26.81	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
185466	WTRMA003755	201.93	AC	200	1978		0	0	Institutional	10	6	3	0	19
185467	WTRMA003755	2.45	AC	200	1978		0	0	SF - Residential	1	6	3	0	10
185480	WTRMA003770	22.87	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185481	WTRMA003770	7.04	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185494	WTRMA003770	1.39	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185495	WTRMA003770	0.80	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185508	WTRMA003766	4.33	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185531	WTRMA003766	2.82	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185544	WTRMA004691	1.19	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185558	WTRMA004691	5.62	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185572	WTRMA004691	8.77	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185600	WTRMA004691	0.80	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185672	WTRMA004691	23.94	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185736	WTRMA004691	0.49	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185764	WTRMA004691	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185765	WTRMA004691	1.77	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185828	WTRMA004688	3.29	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185829	WTRMA004688	0.25	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185858	WTRMA004688	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185909	WTRMA004688	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185923	WTRMA004688	21.91	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185936	WTRMA004688	2.89	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185937	WTRMA004688	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
185950	WTRMA004688	21.91	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186006	WTRMA004688	3.16	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186007	WTRMA004688	19.81	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186043	WTRMA004688	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186050	WTRMA004688	22.15	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186051	WTRMA004688	0.49	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186056	WTRMA004688	0.49	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186057	WTRMA004688	2.89	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186062	WTRMA004688	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186063	WTRMA004688	2.88	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186068	WTRMA004688	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186069	WTRMA004688	21.91	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186075	WTRMA004691	0.24	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186076	WTRMA004691	3.61	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186081	WTRMA004691	23.03	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186082	WTRMA004691	0.26	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186087	WTRMA004691	0.55	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186093	WTRMA004691	0.50	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186094	WTRMA004691	24.75	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186099	WTRMA004691	0.34	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186100	WTRMA004691	25.30	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186105	WTRMA004691	0.34	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186106	WTRMA004691	0.16	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186111	WTRMA003766	0.49	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186112	WTRMA003766	4.09	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
186123	WTRMA003593	3.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186124	WTRMA003593	11.87	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186137	WTRMA003593	2.93	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186145	WTRMA003593	3.54	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186146	WTRMA003593	0.63	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186153	WTRMA003593	3.78	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186161	WTRMA003593	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186162	WTRMA003593	3.77	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186168	WTRMA003593	19.61	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186169	WTRMA003593	0.50	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186180	WTRMA003632	4.47	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
186181	WTRMA003632	4.38	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
186194	WTRMA003632	3.37	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
186195	WTRMA003632	3.74	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
186208	WTRMA003628	13.54	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186209	WTRMA003628	24.82	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186222	WTRMA004628	13.39	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186223	WTRMA004628	15.62	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186237	WTRMA004632	11.31	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186250	WTRMA004632	24.91	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186251	WTRMA004632	16.95	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186270	WTRMA004629	25.40	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186271	WTRMA004629	0.34	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186290	WTRMA004626	14.60	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186291	WTRMA004626	6.07	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186324	WTRMA004621	1.30	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186325	WTRMA004621	1.22	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186338	WTRMA004626	2.26	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186339	WTRMA004626	6.32	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186352	WTRMA004621	2.13	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186353	WTRMA004621	26.64	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186366	WTRMA004621	2.28	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186367	WTRMA004621	18.10	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186380	WTRMA004621	14.92	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186381	WTRMA004621	1.28	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186395	WTRMA004621	1.48	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186408	WTRMA004621	11.74	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186409	WTRMA004621	10.67	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186436	WTRMA003616	1.33	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186451	WTRMA003616	2.26	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186465	WTRMA003616	3.81	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
186478	WTRMA003616	25.20	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186479	WTRMA003616	0.50	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186492	WTRMA003620	0.07	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186493	WTRMA003620	25.98	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
186506	WTRMA004499	9.08	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186507	WTRMA004499	7.73	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186526	WTRMA004501	0.25	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186527	WTRMA004501	23.63	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186540	WTRMA004501	3.71	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186541	WTRMA004501	1.83	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186554	WTRMA004504	14.03	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186582	WTRMA004504	5.96	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186583	WTRMA004504	9.61	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186598	WTRMA004504	2.19	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186612	WTRMA004504	23.60	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186613	WTRMA004504	2.11	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186626	WTRMA004506	5.99	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186627	WTRMA004506	9.11	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186640	WTRMA003612	2.98	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186641	WTRMA003612	17.16	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186654	WTRMA003612	9.64	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186655	WTRMA003612	2.20	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186683	WTRMA002817	2.25	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186696	WTRMA002817	2.14	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186697	WTRMA002817	0.60	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186711	WTRMA004196	11.97	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186732	WTRMA004196	12.04	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186733	WTRMA004196	2.17	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186747	WTRMA004196	9.40	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186760	WTRMA004196	9.52	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186761	WTRMA004196	0.50	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
186768	WTRMA004504	2.67	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186774	WTRMA004504	7.49	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186775	WTRMA004504	13.78	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
186803	WTRMA009920	6.39	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
186811	WTRMA009922	11.84	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186815	WTRMA009923	6.20	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
186819	WTRMA009924	12.33	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186831	WTRMA009927	38.83	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
186862	WTRMA009925	28.86	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186883	WTRMA009925	0.36	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186889	WTRMA009925	1.44	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186890	WTRMA009925	5.96	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186897	WTRMA009925	0.34	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186904	WTRMA009925	0.27	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186905	WTRMA009925	1.41	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186912	WTRMA009928	13.51	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186920	WTRMA009925	13.69	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186921	WTRMA009925	0.69	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186937	WTRMA009921	33.03	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
186953	WTRMA009921	8.65	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
186960	WTRMA009921	4.54	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
186961	WTRMA009921	18.99	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
186976	WTRMA009928	32.45	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
186977	WTRMA009928	0.15	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
187116	WTRMA009921	1.56	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
187117	WTRMA009921	29.79	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
187147	WTRMA009939	26.54	PVC	200	2012		0	0	SF - Residential	1	0	1	0	2
187159	WTRMA009942	0.71	PVC	200	2012		0	0	SF - Residential	1	0	1	0	2
187163	WTRMA009943	0.71	PVC	150	2011		0	0	SF - Residential	1	0	1	0	2
187197	WTRMA009944	25.48	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
187198	WTRMA009944	16.53	PVC	250	2011		0	0	SF - Residential	1	0	1	0	2
187213	WTRMA009947	12.92	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
187225	WTRMA009950	1.56	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
187229	WTRMA009951	13.60	PVC	300	2011		0	0	Commercial	8	0	1	0	9
187237	WTRMA009953	6.47	PVC	300	2011		0	0	Commercial	8	0	1	0	9
187241	WTRMA009954	5.66	PVC	300	2011		0	0	Commercial	8	0	1	0	9
187257	WTRMA009958	0.83	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
187261	WTRMA009959	1.03	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
187289	WTRMA009960	15.73	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
187293	WTRMA009961	0.94	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
187301	WTRMA009963	20.47	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
187305	WTRMA009964	178.40	PVC	200	2010		1	6	SF - Residential	1	0	1	0	8
187309	WTRMA009965	6.37	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
187314	WTRMA009966	2.93	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
187320	WTRMA009967	12.81	PVC	200	2011		0	0	SF - Residential	1	0	1	5	7
187324	WTRMA009968	1.20	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
187328	WTRMA009969	146.15	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
187448	WTRMA009977	45.00	PVC	250	2012		0	0	Industrial	7	0	1	0	8
187452	WTRMA009978	45.00	PVC	250	2012		0	0	Industrial	7	0	1	0	8
187458	WTRMA005584	1.87	PVC	300	1989		0	0	Industrial	7	4	1	0	12
187459	WTRMA005584	14.31	PVC	300	1989		0	0	Industrial	7	4	1	0	12
187504	WTRMA009974	5.09	PVC	250	2012		0	0	Industrial	7	0	1	0	8
187528	WTRMA009988	0.97	PVC	250	2013		0	0	Industrial	7	0	1	0	8
187532	WTRMA009989	49.90	PVC	250	2012		0	0	Industrial	7	0	1	0	8
187540	WTRMA009975	33.40	PVC	250	2012		0	0	Industrial	7	0	1	0	8
187541	WTRMA009975	11.67	PVC	250	2012		0	0	Industrial	7	0	1	0	8
187560	WTRMA000111	55.91	AC	200	1982		0	0	Industrial	7	6	3	0	16
187561	WTRMA000111	27.22	AC	200	1982		0	0	Industrial	7	6	3	0	16
187686	WTRMA009993	51.11	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187694	WTRMA009995	49.80	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187708	WTRMA009998	2.74	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187730	WTRMA010003	43.36	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187758	WTRMA010010	4.84	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187772	WTRMA000131	7.59	AC	200	1982		0	0	Industrial	7	6	3	0	16
187773	WTRMA000131	3.40	AC	200	1982		0	0	Industrial	7	6	3	0	16
187792	WTRMA010013	10.26	PVC	200	2012		0	0	Industrial	7	0	1	0	8
187796	WTRMA010014	64.53	PVC	200	2012		0	0	Industrial	7	0	1	0	8

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
187810	WTRMA010017	10.57	PVC	200	2012		0	0	Industrial	7	0	1	0	8
187826	WTRMA010021	70.39	PVC	200	2012		0	0	Commercial	8	0	1	0	9
187830	WTRMA010022	0.65	PVC	200	2012		0	0	Industrial	7	0	1	0	8
187834	WTRMA010023	13.03	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187838	WTRMA010024	22.36	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187889	WTRMA009990	37.61	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187901	WTRMA009994	2.74	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187902	WTRMA009994	21.35	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187919	WTRMA010002	29.80	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187937	WTRMA010002	6.53	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187938	WTRMA010002	9.98	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187955	WTRMA010004	2.85	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187956	WTRMA010004	52.03	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187973	WTRMA010011	33.80	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187974	WTRMA010011	3.59	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187991	WTRMA010009	10.55	PVC	300	2012		0	0	Industrial	7	0	1	0	8
187992	WTRMA010009	15.39	PVC	300	2012		0	0	Industrial	7	0	1	0	8
188004	WTRMA010018	58.32	PVC	200	2012		0	0	Commercial	8	0	1	0	9
188025	WTRMA010018	14.01	PVC	200	2012		0	0	Industrial	7	0	1	0	8
188026	WTRMA010018	6.39	PVC	200	2012		0	0	Industrial	7	0	1	0	8
188043	WTRMA009999	2.77	PVC	300	2012		0	0	Industrial	7	0	1	0	8
188061	WTRMA009999	8.58	PVC	300	2012		0	0	Industrial	7	0	1	0	8
188062	WTRMA009999	24.53	PVC	300	2012		0	0	Industrial	7	0	1	0	8
188080	WTRMA010012	4.56	PVC	300	2012		0	0	Industrial	7	0	1	0	8
188081	WTRMA010012	60.27	PVC	300	2012		0	0	Industrial	7	0	1	0	8
188110	WTRMA010042	71.40	PVC	300	2012		0	0	Industrial	7	0	1	0	8
188130	WTRMA009990	27.39	PVC	300	2012		0	0	Industrial	7	0	1	0	8
188135	WTRMA010043	1.31	PVC	300	2012		0	0	Industrial	7	0	1	0	8
188143	WTRMA001496	0.37	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
188147	WTRMA001496	18.37	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
188151	WTRMA001496	0.15	PVC	150	2003		0	0	SF - Residential	1	2	1	0	4
188233	WTRMA010047	14.64					0	0	SF - Residential	1	0	0	0	1
188326	WTRMA001528	0.00	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
188327	WTRMA001528	18.72	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
366521	WTRMA010048	5.31	PVC	400	2012		0	0	Industrial	12	0	1	0	13
366543	WTRMA010053	45.78	PVC	400	2012		0	0	Industrial	12	0	1	0	13
366547	WTRMA010054	26.31	PVC	400	2012		0	0	Industrial	12	0	1	0	13
366551	WTRMA010055	6.03	PVC	400	2012		0	0	Industrial	12	0	1	0	13
366555	WTRMA010056	87.03	PVC	400	2012		0	0	Industrial	12	0	1	0	13
366563	WTRMA010058	79.28	PVC	400	2012		0	0	Industrial	12	0	1	0	13
366567	WTRMA010059	6.00	PVC	300	2012		0	0	Industrial	7	0	1	0	8
366571	WTRMA010060	5.11	PVC	300	2012		0	0	Industrial	7	0	1	0	8
366667	WTRMA010061	5.00	PVC	300	2012		0	0	Industrial	7	0	1	0	8
366717	WTRMA010068	6.00	PVC	200	2012		0	0	Industrial	7	0	1	0	8
366721	WTRMA010069	9.13	PVC	200	2012		0	0	Industrial	7	0	1	0	8
366743	WTRMA010072	9.12	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366747	WTRMA010073	6.00	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366753	WTRMA010050	15.49	PVC	400	2012		0	0	Industrial	12	0	1	0	13
366754	WTRMA010050	18.90	PVC	400	2012		0	0	Industrial	12	0	1	0	13
366761	WTRMA010074	26.86	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366771	WTRMA010075	26.31	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366823	WTRMA010075	22.25	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366843	WTRMA010075	10.63	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366851	WTRMA010075	7.00	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366860	WTRMA010075	6.00	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366861	WTRMA010075	65.88	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366868	WTRMA010075	84.30	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366869	WTRMA010075	6.15	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366956	WTRMA010027	38.74	PVC	300	2012		0	0	Industrial	7	0	1	0	8
366957	WTRMA010027	6.62	PVC	300	2012		0	0	Industrial	7	0	1	0	8
366962	WTRMA010086	6.00	AC	200	2012		0	0	Industrial	7	0	3	0	10
366966	WTRMA010087	6.80	AC	200	2012		0	0	Industrial	7	0	3	0	10
366972	WTRMA009979	8.33	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366973	WTRMA009979	8.33	PVC	250	2012		0	0	Industrial	7	0	1	0	8
366986	WTRMA002750	3.19	PVC	250	2004		0	0	Commercial	8	2	1	0	11
367014	WTRMA002750	72.63	PVC	250	2004		0	0	Commercial	8	2	1	0	11
367029	WTRMA002750	6.49	PVC	250	2004		0	0	Commercial	8	2	1	0	11
367030	WTRMA002750	11.36	PVC	250	2004		0	0	Commercial	8	2	1	0	11
367065	WTRMA002750	14.54	PVC	250	2004		0	0	Commercial	8	2	1	0	11
367095	WTRMA010095	30.35	PVC	250	2012		0	0	Commercial	8	0	1	0	9
367102	WTRMA010096	8.34	PVC	250	2012		0	0	Commercial	8	0	0	0	8
367106	WTRMA010097	18.59	PVC	250	2012		0	0	Commercial	8	0	1	0	9
367116	WTRMA010099	5.75	PVC	250	2012		0	0	Commercial	8	0	0	0	8
367123	WTRMA002750	25.84	PVC	250	2004		0	0	Commercial	8	2	1	0	11
367124	WTRMA002750	12.58	PVC	250	2004		0	0	Commercial	8	2	1	0	11
367146	WTRMA007918	4.50	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
367147	WTRMA007918	0.17	PVC	200	2011		0	0	SF - Residential	1	0	1	0	2
367175	WTRMA010100	13.16	PVC	300	2012		0	0	Commercial	8	0	1	0	9
367179	WTRMA010101	78.37	PVC	300	2012		0	0	Commercial	8	0	1	0	9
367183	WTRMA010102	71.83	PVC	300	2012		0	0	Commercial	8	0	1	0	9
367187	WTRMA010103	11.92	PVC	300	2012		0	0	Commercial	8	0	1	0	9
367191	WTRMA010104	6.68	PVC	300	2012		0	0	Commercial	8	0	1	0	9
367246	WTRMA005194	301.66	CI	150	1954	1993	0	0	N/A	0	0	0	0	0
367253	WTRMA010108	5.41	CI	150	1954		0	0	Industrial	7	12	10	0	29
367310	WTRMA003728	58.16	PVC	250	2007		0	0	Industrial	7	0	1	0	8
367311	WTRMA003728	0.03	PVC	250	2007		0	0	Industrial	7	0	1	0	8
367407	WTRMA003236	4.01	PVC	250	1985		0	0	Industrial	7	6	1	0	14
367408	WTRMA003236	0.00	PVC	250	1985		0	0	Industrial	7	6	1	0	14
367417	WTRMA003241	1.00	PVC	250	1985		0	0	Industrial	7	6	1	0	14
367418	WTRMA003241	0.01	PVC	250	1985		0	0	Industrial	7	6	1	0	14
367452	WTRMA003445	0.00	AC	200	1977		0	0	Industrial	7	6	3	0	16
367453	WTRMA003445	15.36	AC	200	1977		0	0	Industrial	7	6	3	5	21
367522	WTRMA001399	0.00	PVC	400	2005		0	0	Industrial	12	2	1	0	15
367540	WTRMA001416	0.00	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367541	WTRMA001416	3.19	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367560	WTRMA001399	62.95	PVC	400	2005		0	0	Industrial	12	2	1	0	15
367561	WTRMA001399	58.54	PVC	400	2005		0	0	Industrial	12	2	1	0	15
367575	WTRMA001427	0.00	PVC	400	2004		0	0	Industrial	12	2	1	0	15

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
367576	WTRMA001427	50.45	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367593	WTRMA001428	0.01	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367594	WTRMA001428	3.92	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367601	WTRMA001431	0.00	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367602	WTRMA001431	36.39	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367607	WTRMA001432	0.00	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367608	WTRMA001432	2.89	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367650	WTRMA001360	0.00	PVC	250	1997		0	0	Industrial	7	2	1	0	10
367651	WTRMA001360	11.55	PVC	250	1997		0	0	Industrial	7	2	1	0	10
367671	WTRMA001365	8.97	PVC	400	1997		0	0	Industrial	12	2	1	0	15
367672	WTRMA001365	0.01	PVC	400	1997		0	0	Industrial	12	2	1	0	15
367684	WTRMA001367	35.67	PVC	400	2000		0	0	Industrial	12	2	1	0	15
367685	WTRMA001367	0.01	PVC	400	2000		0	0	Industrial	12	2	1	0	15
367708	WTRMA001377	0.60	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367709	WTRMA001377	0.00	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367722	WTRMA001380	77.09	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367723	WTRMA001380	0.00	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367743	WTRMA001385	0.00	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367744	WTRMA001385	12.89	PVC	400	2004		0	0	Industrial	12	2	1	0	15
367793	WTRMA004975	0.00	AC	250	1978		0	0	Industrial	7	6	3	0	16
367794	WTRMA004975	6.61	AC	250	1978		0	0	Industrial	7	6	3	0	16
367797	WTRMA004976	0.06	AC	250	1978		0	0	Industrial	7	6	3	0	16
367798	WTRMA004976	122.18	AC	250	1978		0	0	Industrial	7	6	3	0	16
367851	WTRMA003127	70.68	AC	250	1979		0	0	Industrial	7	6	3	0	16
367860	WTRMA003109	106.33	AC	250	1979		0	0	Industrial	7	6	3	0	16
367930	WTRMA003120	75.21	AC	200	1979		0	0	Industrial	7	6	3	0	16
367931	WTRMA003120	0.46	AC	200	1979		0	0	Industrial	7	6	3	0	16
367941	WTRMA005259	81.56	AC	150	1979		0	0	Industrial	7	6	3	0	16
367942	WTRMA005259	0.00	AC	150	1979		0	0	Industrial	7	6	3	0	16
367964	WTRMA001391	0.00	PVC	250	2004		0	0	Industrial	7	2	1	0	10
367965	WTRMA001391	16.43	PVC	250	2004		0	0	Industrial	7	2	1	0	10
368000	WTRMA003579	23.02	AC	400	1979		0	0	Industrial	12	6	3	0	21
368001	WTRMA003579	0.45	AC	400	1979		0	0	Industrial	12	6	3	0	21
368008	WTRMA003580	1.84	AC	400	1979		0	0	Industrial	12	6	3	0	21
368009	WTRMA003580	115.35	AC	400	1979		0	0	Industrial	12	6	3	0	21
368021	WTRMA003556	117.34	AC	400	1979		0	0	Industrial	12	6	3	0	21
368022	WTRMA003556	0.01	AC	400	1979		0	0	Industrial	12	6	3	0	21
368059	WTRMA003518	1.39	AC	200	1966		0	0	Industrial	7	8	3	0	18
368060	WTRMA003518	0.00	AC	200	1966		0	0	Industrial	7	8	3	0	18
368070	WTRMA003528	0.00	AC	200	1967		0	0	Industrial	7	8	3	0	18
368076	WTRMA003528	0.00	AC	200	1967		0	0	Industrial	7	8	3	0	18
368077	WTRMA003528	3.79	AC	200	1967		0	0	Industrial	7	8	3	0	18
368270	WTRMA000040	21.42	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
368271	WTRMA000040	0.00	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
368278	WTRMA000039	6.54	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
368279	WTRMA000039	0.00	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
368305	WTRMA003488	0.00	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
368306	WTRMA003488	70.70	AC	150	1971		0	0	SF - Residential	1	8	3	0	12
368342	WTRMA000032	0.00	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
368343	WTRMA000032	19.82	AC	150	1982		0	0	Institutional, SF - residential	10	6	3	5	24
368348	WTRMA000031	21.70	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
368354	WTRMA000031	5.86	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
368355	WTRMA000031	14.28	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
368360	WTRMA000031	5.03	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
368361	WTRMA000031	1.97	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
368366	WTRMA000031	3.06	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
368367	WTRMA000031	11.98	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
368391	WTRMA000008	22.44	AC	400	1982		0	0	Commercial	13	6	3	5	27
368427	WTRMA001348	95.79	PVC	400	1997		0	0	Industrial	12	2	1	0	15
368428	WTRMA001348	0.00	PVC	400	1997		0	0	Industrial	12	2	1	0	15
368442	WTRMA001345	1.04	PVC	400	1997		0	0	Industrial	12	2	1	0	15
368443	WTRMA001345	0.00	PVC	400	1997		0	0	Industrial	12	2	1	0	15
368470	WTRMA000090	1.00	AC	250	1982		0	0	Industrial	7	6	3	0	16
368471	WTRMA000090	0.00	AC	250	1982		0	0	Industrial	7	6	3	0	16
368478	WTRMA000091	0.01	AC	250	1982		0	0	Industrial	7	6	3	0	16
368479	WTRMA000091	129.20	AC	250	1982		0	0	Industrial	7	6	3	10	26
368502	WTRMA002802	0.00	PVC	150	1975		0	0	SF - Residential	1	8	1	0	10
368510	WTRMA002809	0.44	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
368511	WTRMA002809	6.69	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
368518	WTRMA003012	0.00	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
368519	WTRMA003012	1.61	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
368523	WTRMA002802	31.48	PVC	150	1975		0	0	SF - Residential	1	8	1	0	10
368524	WTRMA002802	150.44	PVC	150	1975		0	0	SF - Residential	1	8	1	0	10
368541	WTRMA003276	6.19	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
368542	WTRMA003276	0.00	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
368547	WTRMA003275	14.04	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
368548	WTRMA003275	0.01	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
368569	WTRMA000294	1.99	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
368570	WTRMA000294	0.01	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
368577	WTRMA003957	79.20	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
368578	WTRMA003957	0.01	AC	150	1965		0	0	SF - Residential	1	10	3	0	14
368590	WTRMA003288	131.76	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
368591	WTRMA003288	0.00	PVC	150	2005		0	0	SF - Residential	1	2	1	0	4
368630	WTRMA000422	6.10	AC	200	1975		0	0	Industrial	7	8	3	0	18
368631	WTRMA000422	0.00	AC	200	1975		0	0	Industrial	7	8	3	0	18
368640	WTRMA004073	148.65	AC	200	1974		0	0	Industrial	7	8	3	0	18
368641	WTRMA004073	0.00	AC	200	1974		0	0	Industrial	7	8	3	0	18
368674	WTRMA000415	0.16	AC	300	1975		0	0	Industrial	7	8	3	0	18
368699	WTRMA000418	0.01	AC	300	1975		0	0	Industrial	7	8	3	0	18
368700	WTRMA000418	1.00	AC	300	1975		0	0	Industrial	7	8	3	0	18
368716	WTRMA001336	24.70	PVC	150	1990		0	0	Industrial	7	4	1	0	12
368717	WTRMA001336	0.00	PVC	150	1990		0	0	Industrial	7	4	1	0	12
368729	WTRMA001327	0.01	PVC	300	1989		0	0	Industrial	7	4	1	0	12
368730	WTRMA001327	15.71	PVC	300	1989		0	0	Industrial	7	4	1	10	22
368756	WTRMA010057	6.28	PVC		2012		0	0	Industrial	7	0	1	0	8
368777	WTRMA010052	0.01	PVC	400	2012		0	0	Industrial	12	0	1	0	13
368778	WTRMA010052	50.44	PVC	400	2012		0	0	Industrial	12	0	1	0	13

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
368785	WTRMA010051	2.39	PVC	400	2012		0	0	Industrial	12	0	1	0	13
368786	WTRMA010051	0.01	PVC	400	2012		0	0	Industrial	12	0	1	0	13
368811	WTRMA002744	8.72	PVC	250	2004		0	0	Commercial	8	2	1	0	11
368834	WTRMA001997	1.42	PVC	400	1999		0	0	SF - Residential	6	2	1	0	9
369104	WTRMA010119	163.94	PVC	400	2011		0	0	Industrial	12	0	1	0	13
369108	WTRMA010120	0.99	PVC	400	2011		0	0	Industrial	12	0	1	0	13
369114	WTRMA010121	41.19	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369118	WTRMA010122	79.98	PVC	400	2011		0	0	Industrial	12	0	1	0	13
369122	WTRMA010123	12.00	PVC	400	2011		0	0	Industrial	12	0	1	0	13
369126	WTRMA010124	44.85	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369152	WTRMA010129	29.81	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369160	WTRMA010130	42.40	PVC	250	2013		0	0	Industrial	7	0	1	0	8
369161	WTRMA010130	10.20	PVC	250	2013		0	0	Industrial	7	0	1	0	8
369166	WTRMA010131	60.49	PVC	250	2013		0	0	Industrial	7	0	1	0	8
369176	WTRMA010133	46.36	PVC	250	2013		0	0	Industrial	7	0	1	0	8
369186	WTRMA010135	18.28	PVC	300	2013		0	0	Industrial	7	0	1	0	8
369190	WTRMA010136	181.87	PVC	300	2013		0	0	Industrial	7	0	1	0	8
369200	WTRMA010138	2.02	PVC	250	2013		0	0	Industrial	7	0	1	0	8
369204	WTRMA010139	12.72	PVC	250	2013		0	0	Industrial	7	0	1	0	8
369216	WTRMA010140	12.44	PVC	250	2013		0	0	Industrial	7	0	1	0	8
369220	WTRMA010141	6.45	PVC	250	2013		0	0	Industrial	7	0	1	0	8
369224	WTRMA010142	8.90	PVC	300	2013		0	0	Industrial	7	0	1	0	8
369228	WTRMA010143	30.89	PVC	400	2011		0	0	Industrial	12	0	1	0	13
369232	WTRMA010144	88.93	PVC	400	2011		0	0	Industrial	7	0	1	0	8
369236	WTRMA010145	2.09	PVC	400	2011		0	0	Industrial	12	0	1	0	13
369252	WTRMA010148	24.73	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369268	WTRMA010152	10.60	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369286	WTRMA010155	44.49	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369294	WTRMA010155	6.00	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369302	WTRMA010155	6.00	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369303	WTRMA010155	33.81	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369311	WTRMA010118	28.88	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369319	WTRMA010118	6.00	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369327	WTRMA010118	14.66	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369334	WTRMA010118	34.79	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369335	WTRMA010118	6.00	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369343	WTRMA010147	55.47	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369350	WTRMA010147	4.33	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369351	WTRMA010147	1.47	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369359	WTRMA010151	0.51	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369366	WTRMA010151	48.66	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369367	WTRMA010151	7.52	PVC	250	2011		0	0	Industrial	7	0	1	0	8
369512	WTRMA005843	4.75	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
369568	WTRMA010186	2.00	PVC	250	2013		0	0	Industrial	7	0	1	0	8
369574	WTRMA010187	1.50	PVC	300	2013		0	0	Industrial	7	0	1	0	8
369743	WTRMA010196	5.97	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
369747	WTRMA010197	12.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
369779	WTRMA010205	15.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
369783	WTRMA010206	21.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
369787	WTRMA010207	18.00	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
369826	WTRMA010214	9.00	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
369839	WTRMA010217	2.83	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
369847	WTRMA010219	15.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
369869	WTRMA010224	18.00	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
369877	WTRMA010226	2.06	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
369895	WTRMA010228	15.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
369971	WTRMA010202	5.96	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370106	WTRMA010223	2.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370118	WTRMA010223	2.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370163	WTRMA010223	0.59	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370190	WTRMA010223	4.39	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370191	WTRMA010223	1.57	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370206	WTRMA010222	5.32	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370207	WTRMA010223	1.36	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370284	WTRMA010210	10.00	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
370298	WTRMA010210	2.00	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
370299	WTRMA010210	21.13	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
370326	WTRMA010222	2.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370345	WTRMA010222	21.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370346	WTRMA010222	2.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370415	WTRMA010200	12.06	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370462	WTRMA010225	22.00	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
370475	WTRMA010225	65.83	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
370476	WTRMA010225	2.77	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
370489	WTRMA010208	10.00	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
370533	WTRMA010200	8.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370547	WTRMA010200	8.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370548	WTRMA010200	11.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370561	WTRMA010194	16.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370575	WTRMA010194	2.03	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370576	WTRMA010194	17.97	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370697	WTRMA005802	23.53	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
370698	WTRMA005802	2.27	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
370751	WTRMA005845	0.14	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
370782	WTRMA005842	7.21	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
370783	WTRMA005842	1.11	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
370821	WTRMA005845	4.10	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
370857	WTRMA005843	23.83	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
370874	WTRMA005843	1.01	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
370875	WTRMA005843	0.54	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
370883	WTRMA010198	4.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370884	WTRMA010198	9.50	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370893	WTRMA010199	21.50	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370908	WTRMA010199	1.98	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370915	WTRMA010199	2.02	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370930	WTRMA010199	27.50	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370937	WTRMA010199	2.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370944	WTRMA010199	2.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
370951	WTRMA010199	2.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370952	WTRMA010199	23.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370958	WTRMA010278	16.56	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370965	WTRMA010278	4.04	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370972	WTRMA010278	1.82	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370979	WTRMA010278	1.57	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370986	WTRMA010278	2.38	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370993	WTRMA010278	2.50	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
370994	WTRMA010278	0.63	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
371001	WTRMA010230	21.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
371008	WTRMA010230	2.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
371015	WTRMA010230	4.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
371022	WTRMA010230	1.99	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
371029	WTRMA010230	4.39	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
371036	WTRMA010230	1.51	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
371043	WTRMA010230	5.38	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
371050	WTRMA010230	1.50	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
371051	WTRMA010230	0.34	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
371350	WTRMA003478	51.10	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
371364	WTRMA003478	11.57	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
371365	WTRMA003478	116.88	AC	150	1979		0	0	SF - Residential	1	6	3	0	10
371396	WTRMA009962	125.27	PVC	200	2010		3	18	SF - Residential	1	0	1	0	20
371397	WTRMA009962	52.14	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
371482	WTRMA010311	6.15					0	0	SF - Residential	1	0	0	0	1
371487	WTRMA004685	49.29	CI	150	1969	1972	0	0	N/A	0	0	0	0	0
371488	WTRMA004685	131.64	CI	150	1969	1972	0	0	N/A	0	0	0	0	0
371557	WTRMA000027	1.82	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
371558	WTRMA000027	8.14	AC	150	1982		0	0	SF - Residential	1	6	3	0	10
371572	WTRMA007200	40.57	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
371592	WTRMA007200	35.10	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
371606	WTRMA010313	0.01					0	0	SF - Residential	1	0	0	0	1
371607	WTRMA010313	11.14					0	0	SF - Residential	1	0	0	0	1
371629	WTRMA007200	3.69	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
371681	WTRMA007200	23.18	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
371717	WTRMA007200	14.40	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
371718	WTRMA007200	3.20	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
371759	WTRMA007201	2.48	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
371810	WTRMA007201	3.25	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
371835	WTRMA007201	24.00	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
371902	WTRMA007201	61.22	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
371903	WTRMA007201	2.12	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
371912	WTRMA004945	56.76	AC	250	1976		0	0	Institutional	10	6	3	0	19
371913	WTRMA004945	17.81	AC	250	1976		0	0	Institutional	10	6	3	0	19
371920	WTRMA004949	7.32	AC	250	1976		0	0	Institutional	10	6	3	0	19
371921	WTRMA004949	7.81	AC	250	1976		0	0	Institutional	10	6	3	0	19
371950	WTRMA004946	74.71	AC	250	1976		0	0	Institutional	10	6	3	0	19
371951	WTRMA004946	42.34	AC	250	1976		0	0	Institutional	10	6	3	0	19
371972	WTRMA005845	22.95	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
372007	WTRMA005845	11.92	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
372008	WTRMA005845	3.70	PVC	400	2010		0	0	SF - Residential	6	0	1	0	7
372022	WTRMA010343	12.34	AC	200			0	0	Industrial	7	0	3	0	10
372026	WTRMA010344	7.28	AC	200			0	0	Commercial	8	0	3	0	11
372121	WTRMA005802	3.99	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
372175	WTRMA005806	3.24	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
372212	WTRMA005807	11.45	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
372213	WTRMA005807	5.41	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
372274	WTRMA005807	11.16	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
372275	WTRMA005807	2.06	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
372302	WTRMA005803	3.28	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
372303	WTRMA005803	19.93	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
372351	WTRMA005802	5.58	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
372352	WTRMA005802	4.04	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
372376	WTRMA005806	2.07	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
372377	WTRMA005806	2.27	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
373336	WTRMA009955	30.98	PVC	300	2011		0	0	Commercial	8	0	1	0	9
373363	WTRMA009949	12.92	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373386	WTRMA009949	10.37	PVC	300	2011		0	0	Commercial	8	0	1	0	9
373435	WTRMA000269	2.41	PVC	150	1990		0	0	Commercial	8	0	1	0	9
373448	WTRMA005873	0.93	AC	250	1975		0	0	Commercial	8	4	1	0	13
373479	WTRMA010385	2.40	PVC	300	2010		0	0	Commercial	8	8	3	0	19
373483	WTRMA010386	5.07	PVC	300	2010		0	0	Commercial	8	0	1	0	9
373491	WTRMA010388	0.72	PVC	300	2010		0	0	Commercial	8	0	1	0	9
373498	WTRMA010387	0.00	PVC	300	2010		0	0	Commercial	8	0	1	0	9
373506	WTRMA010387	2.75	PVC	300	2010		0	0	Commercial	8	0	1	0	9
373507	WTRMA010387	0.00	PVC	300	2010		0	0	Commercial	8	0	1	0	9
373521	WTRMA010390	7.58	PVC	300	2012		0	0	Commercial	8	0	1	0	9
373522	WTRMA010390	17.53	PVC	300	2012		0	0	Commercial	8	0	1	0	9
373527	WTRMA010391	0.94	PVC	300	2010		0	0	Commercial	8	0	1	0	9
373531	WTRMA010392	2.44	PVC	300	2010		0	0	Commercial	8	0	1	0	9
373535	WTRMA010393	1.37	PVC	300	2010		0	0	Commercial	8	0	1	0	9
373546	WTRMA010395	14.22	PVC	300	2012		0	0	Commercial	8	0	1	0	9
373557	WTRMA003310	1.47	PVC	250	2003		0	0	Commercial	8	2	1	0	11
373558	WTRMA003310	0.07	PVC	250	2003		0	0	Commercial	8	2	1	0	11
373569	WTRMA009949	11.14	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373588	WTRMA009949	7.11	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373589	WTRMA009949	8.54	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373596	WTRMA009949	5.96	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373604	WTRMA009949	8.47	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373605	WTRMA009949	1.99	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373620	WTRMA009949	9.43	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373621	WTRMA009949	0.71	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373631	WTRMA009949	3.24	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373639	WTRMA009949	12.50	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373650	WTRMA009949	0.05	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373651	WTRMA009949	17.50	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373659	WTRMA009949	15.06	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373670	WTRMA009949	3.29	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2
373671	WTRMA009949	14.89	PVC	300	2011		0	0	SF - Residential	1	0	1	0	2

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
373678	WTRMA009949	5.65	PVC	300	2011		0	0	Commercial	8	0	1	0	9
373679	WTRMA009949	4.86	PVC	300	2011		0	0	Commercial	8	0	1	0	9
373689	WTRMA009955	67.12	PVC	300	2011		0	0	Commercial	8	0	1	0	9
373699	WTRMA009955	15.67	PVC	300	2011		0	0	Commercial	8	0	1	0	9
373710	WTRMA009955	10.37	PVC	300	2011		0	0	Commercial	8	0	1	0	9
373711	WTRMA009955	15.42	PVC	300	2011		0	0	Commercial	8	0	1	0	9
373978	WTRMA010389	7.94	PVC	300	2012		0	0	Commercial	8	0	1	0	9
373990	WTRMA010389	37.98	PVC	300	2012		0	0	Commercial	8	0	1	0	9
374002	WTRMA010389	13.53	PVC	300	2012		0	0	Commercial	8	0	1	0	9
374015	WTRMA010389	16.76	PVC	300	2012		0	0	Commercial	8	0	1	0	9
374016	WTRMA010389	8.15	PVC	300	2012		0	0	Commercial	8	0	1	0	9
374028	WTRMA010396	36.26	PVC	300	2012		0	0	Commercial	8	0	1	0	9
374044	WTRMA010396	28.05	PVC	300	2012		0	0	Commercial	8	0	1	0	9
374045	WTRMA010396	11.81	PVC	300	2012		0	0	Commercial	8	0	1	0	9
374153	WTRMA004568	25.91	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
374154	WTRMA004568	4.26	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
374412	WTRMA005806	16.88	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
374413	WTRMA005806	4.81	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
374435	WTRMA005802	3.09	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
374436	WTRMA005802	21.15	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
374450	WTRMA010439	3.70	CI	150	1951		0	0	Institutional and commercial	10	12	10	0	32
374454	WTRMA010440	1.54	CI	150	1951		0	0	Commercial	8	12	10	0	30
376477	WTRMA010570	4.93					0	0	SF - Residential	1	0	0	0	1
376584	WTRMA004581	5.47	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
376585	WTRMA004581	17.35	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
376660	WTRMA004586	14.85	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
376661	WTRMA004586	11.23	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
376729	WTRMA005839	3.63	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
376730	WTRMA005839	5.09	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
376780	WTRMA005679	5.08	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
376813	WTRMA005679	5.06	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
376856	WTRMA005679	22.49	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
376857	WTRMA005679	4.69	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
376878	WTRMA005677	3.28	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
376879	WTRMA005677	8.92	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
376900	WTRMA005678	30.59	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
376901	WTRMA005678	11.32	PVC	400	2009		0	0	SF - Residential	6	0	1	0	7
376973	WTRMA010599	18.95	PVC	300	2012		0	0	Commercial	8	0	1	0	9
376974	WTRMA010599	0.16	PVC	300	2012		0	0	Commercial	8	0	1	0	9
377093	WTRMA000657	56.50	CI	150	1947		1	6	Commercial	8	12	10	0	36
377094	WTRMA000657	20.92	CI	150	1947		1	6	Commercial	8	12	10	0	36
377209	WTRMA000013	13.60	AC	400	1982		0	0	Commercial	13	6	3	0	22
377220	WTRMA000013	14.05	AC	400	1982		0	0	Commercial	13	6	3	0	22
377229	WTRMA000013	1.02	AC	400	1982		0	0	Commercial	13	6	3	0	22
377230	WTRMA000013	11.58	AC	400	1982		0	0	Commercial	13	6	3	0	22
377237	WTRMA000013	8.44	AC	400	1982		0	0	Commercial	13	6	3	0	22
377238	WTRMA000013	6.20	AC	400	1982		0	0	Commercial	13	6	3	0	22
377469	WTRMA010208	2.00	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
377470	WTRMA010208	22.00	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
377490	WTRMA010208	2.77	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
377491	WTRMA010208	55.23	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
377594	WTRMA010214	1.25	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
377595	WTRMA010214	8.57	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
377602	WTRMA010212	14.93	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
377603	WTRMA010212	1.25	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
377630	WTRMA010227	1.30	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
377631	WTRMA010227	0.14	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
377645	WTRMA010213	1.25	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
377653	WTRMA010213	1.90	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
377671	WTRMA010213	77.36	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
377672	WTRMA010213	13.88	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
377687	WTRMA010622	9.32	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
377693	WTRMA010623	55.11	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
377697	WTRMA010624	76.84	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
377806	WTRMA010627	27.97	PVC	250	2012		0	0	Industrial	7	0	1	0	8
377836	WTRMA010629	90.31	PVC	300	2012		0	0	Industrial	7	0	1	0	8
377842	WTRMA010629	2.24	PVC	300	2012		0	0	Industrial	7	0	1	0	8
377843	WTRMA010629	12.23	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378363	WTRMA010627	45.31	PVC	250	2012		0	0	Industrial	7	0	1	0	8
378385	WTRMA010627	6.48	PVC	250	2012		0	0	Industrial	7	0	1	0	8
378386	WTRMA010627	10.25	PVC	250	2012		0	0	Industrial	7	0	1	0	8
378558	WTRMA010630	63.30	PVC	400	2012		0	0	Industrial	12	0	1	0	13
378559	WTRMA010630	11.03	PVC	400	2012		0	0	Industrial	12	0	1	0	13
378696	WTRMA010643	20.89	PVC	250	2012		0	0	Industrial	7	0	1	0	8
378703	WTRMA010643	6.58	PVC	250	2012		0	0	Industrial	7	0	1	0	8
378710	WTRMA010643	47.00	PVC	250	2012		0	0	Industrial	7	0	1	0	8
378711	WTRMA010643	3.16	PVC	250	2012		0	0	Industrial	7	0	1	0	8
378716	WTRMA010644	9.07	PVC	250	2012		0	0	Industrial	7	0	1	0	8
378720	WTRMA010645	3.03	PVC	250	2012		0	0	Industrial	7	0	1	0	8
378728	WTRMA010647	24.59	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378736	WTRMA010649	6.68	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378746	WTRMA010650	15.04	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378754	WTRMA010652	5.97	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378758	WTRMA010651	50.02	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378765	WTRMA010651	3.45	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378766	WTRMA010651	12.09	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378782	WTRMA010653	3.06	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378789	WTRMA010653	6.37	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378790	WTRMA010653	11.00	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378796	WTRMA010654	62.53	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378800	WTRMA010655	5.67	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378808	WTRMA010657	47.85	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378812	WTRMA010658	5.44	PVC	300	2012		0	0	Industrial	7	0	1	0	8
378823	WTRMA010659	47.00	PVC	400	2012		0	0	Industrial	12	0	1	0	13

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
378824	WTRMA010659	22.08	PVC	400	2012		0	0	Industrial	12	0	1	0	13
378830	WTRMA010660	9.94	PVC	400	2012		0	0	Industrial	12	0	1	0	13
379087	WTRMA004573	2.21	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
379088	WTRMA004573	14.88	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
379173	WTRMA004559	12.42	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
379174	WTRMA004559	0.51	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
379238	WTRMA004552	6.75	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
379239	WTRMA004552	6.75	PVC	200	2007		0	0	SF - Residential	1	0	1	0	2
379262	WTRMA004589	0.45	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
379263	WTRMA004589	17.87	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
379299	WTRMA004584	12.29	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
379306	WTRMA004584	23.54	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
379307	WTRMA004584	7.68	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
379487	WTRMA010665	6.00	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
379495	WTRMA010667	13.64	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
379499	WTRMA010668	1.50	PVC	400	2013		0	0	SF - Residential	1	0	1	0	2
379513	WTRMA010670	20.76	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379517	WTRMA010671	4.00	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379521	WTRMA010672	18.89	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379537	WTRMA010676	19.26	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379541	WTRMA010677	6.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
379549	WTRMA010679	7.15	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379557	WTRMA010681	20.03	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379565	WTRMA010683	13.25	PVC	400	2013		0	0	SF - Residential	1	0	0	0	1
379579	WTRMA010666	25.45	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
379580	WTRMA010666	16.29	PVC	300	2013		0	0	SF - Residential	1	0	1	0	2
379597	WTRMA010673	7.79	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379617	WTRMA010673	24.33	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379639	WTRMA010673	5.66	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379661	WTRMA010673	23.08	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379669	WTRMA010673	3.77	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379703	WTRMA010673	7.78	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379727	WTRMA010673	20.43	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379735	WTRMA010673	3.97	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379745	WTRMA010673	2.03	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379753	WTRMA010673	4.00	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379817	WTRMA010673	22.73	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379818	WTRMA010673	3.28	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379826	WTRMA010674	3.91	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379837	WTRMA010674	0.13	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379838	WTRMA010674	0.73	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379846	WTRMA010675	3.47	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379910	WTRMA010675	13.99	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379915	WTRMA010675	17.38	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379916	WTRMA010675	3.97	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379950	WTRMA010680	10.77	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379959	WTRMA010680	19.21	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
379960	WTRMA010680	0.58	PVC	400	2013		0	0	SF - Residential	6	0	1	0	7
380003	WTRMA010682	19.80			2013		0	0	SF - Residential	1	0	0	0	1
380004	WTRMA010682	8.00			2013		0	0	SF - Residential	1	0	0	0	1
380013	WTRMA010682	1.97	PVC	200	2013		0	0	SF - Residential	1	0	0	0	1
380014	WTRMA010682	2.00	PVC	200	2013		0	0	SF - Residential	1	0	0	0	1
380023	WTRMA010684	2.00	PVC	200	2013		0	0	SF - Residential	1	0	0	0	1
380024	WTRMA010684	4.00			2013		0	0	SF - Residential	1	0	0	0	1
380042	WTRMA010678	18.19	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
380075	WTRMA010678	25.42	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
380076	WTRMA010678	1.99	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
380125	WTRMA010708	4.55	PVC	400	2014		0	0	SF - Residential	1	0	1	0	2
380131	WTRMA010708	1.34	PVC	400	2014		0	0	SF - Residential	1	0	1	0	2
380137	WTRMA010708	4.26	PVC	400	2014		0	0	SF - Residential	1	0	1	0	2
380212	WTRMA010715	14.68	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
380289	WTRMA010719	0.03	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
380331	WTRMA010724	7.92	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
380469	WTRMA001687	1.21	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
380470	WTRMA001687	0.00	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
380976	WTRMA010725	1.65	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
380992	WTRMA010725	9.38	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381016	WTRMA010708	7.26	PVC	400	2014		0	0	SF - Residential	1	0	1	0	2
381017	WTRMA010708	2.69	PVC	400	2014		0	0	SF - Residential	1	0	1	0	2
381040	WTRMA010725	3.89	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381061	WTRMA010725	6.29	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381076	WTRMA010725	3.95	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381101	WTRMA010725	10.52	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381102	WTRMA010725	2.50	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381114	WTRMA010721	1.72	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381154	WTRMA010721	3.81	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381155	WTRMA010721	3.74	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381212	WTRMA010721	3.65	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381213	WTRMA010721	0.58	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381226	WTRMA010721	16.66	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381227	WTRMA010721	0.84	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381263	WTRMA010721	14.14	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381264	WTRMA010721	7.88	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381296	WTRMA010719	1.90	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381308	WTRMA010721	3.70	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381309	WTRMA010721	2.73	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381338	WTRMA010719	6.63	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381352	WTRMA010719	3.79	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381400	WTRMA010719	15.18	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381413	WTRMA010719	12.03	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381414	WTRMA010719	2.01	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381427	WTRMA010719	1.81	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381428	WTRMA010719	1.90	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381455	WTRMA010718	7.67	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381456	WTRMA010718	9.92	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381471	WTRMA010714	10.80	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381472	WTRMA010714	0.24	PVC	400	2014		0	0	SF - Residential	6	0	1	0	7
381586	WTRMA001703	0.00	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
381587	WTRMA001703	1.00	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
381703	WTRMA001659	33.82	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
381704	WTRMA001659	0.58	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
381726	WTRMA001663	0.90	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
381727	WTRMA001663	32.92	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
381744	WTRMA001663	1.06	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
381745	WTRMA001663	30.76	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
381759	WTRMA001663	1.22	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
381760	WTRMA001663	10.27	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
381868	WTRMA010716	3.89	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
381887	WTRMA010716	10.78	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
381901	WTRMA010716	0.36	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
381902	WTRMA010716	23.22	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
381949	WTRMA010713	4.85	PVC	400			0	0	SF - Residential	6	0	1	0	7
381956	WTRMA010713	0.24	PVC	400			0	0	SF - Residential	6	0	1	0	7
382455	WTRMA010723	0.24	PVC	400			0	0	SF - Residential	6	0	1	0	7
382456	WTRMA010723	13.85	PVC	400			0	0	SF - Residential	6	0	1	0	7
382463	WTRMA010713	0.93	PVC	400			0	0	SF - Residential	6	0	1	0	7
382464	WTRMA010713	0.24	PVC	400			0	0	SF - Residential	6	0	1	0	7
382519	WTRMA005836	6.91	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
382520	WTRMA005836	3.53	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
382543	WTRMA001962	3.77	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
382544	WTRMA001962	6.99	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
382570	WTRMA001957	5.48	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
382571	WTRMA001957	40.61	PVC	200	2004		0	0	SF - Residential	1	2	1	0	4
382642	WTRMA002265	1.39	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
382643	WTRMA002265	13.95	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
382940	WTRMA002260	1.98	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
382941	WTRMA002260	13.56	PVC	200	1994		0	0	SF - Residential	1	4	1	0	6
382987	WTRMA002252	20.98	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
382988	WTRMA002252	8.49	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
383013	WTRMA002252	6.69	PVC	200	1993		0	0	SF - Residential	1	4	1	0	6
383301	WTRMA000440	0.75	AC	200	1975		0	0	Commercial	8	8	3	0	19
383302	WTRMA000440	0.94	AC	200	1975		0	0	SF - Residential	1	8	3	0	12
383309	WTRMA004898	0.75	CI	150	1952		0	0	Commercial	8	12	10	0	30
383310	WTRMA004898	7.82	CI	150	1952		0	0	Commercial	8	12	10	0	30
383694	WTRMA002596	5.70	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
383695	WTRMA002596	3.33	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
383707	WTRMA002593	3.77	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
383708	WTRMA002593	3.30	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
383730	WTRMA002590	6.15	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
383740	WTRMA002590	5.65	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
383741	WTRMA002590	7.19	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
383794	WTRMA002369	5.90	AC	400	1980		0	0	Institutional	15	6	3	0	24
383795	WTRMA002369	4.51	AC	400	1980		0	0	Institutional	15	6	3	0	24
383854	WTRMA002381	0.08	AC	300	1980		0	0	Institutional	10	6	3	0	19
383855	WTRMA002381	11.92	AC	300	1980		0	0	Institutional	10	6	3	0	19
383863	WTRMA002382	4.25	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
383864	WTRMA002382	7.62	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
384023	WTRMA002418	0.19	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
384024	WTRMA002418	7.80	AC	300	1980		0	0	SF - Residential	1	6	3	0	10
384063	WTRMA002639	13.81	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
384064	WTRMA002639	15.49	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
384568	WTRMA002393	16.08	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384569	WTRMA002393	0.00	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384590	WTRMA002394	9.29	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384591	WTRMA002394	0.70	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384615	WTRMA002397	0.41	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384625	WTRMA002397	16.09	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384626	WTRMA002397	0.10	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384633	WTRMA002397	14.99	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384634	WTRMA002397	0.41	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384647	WTRMA002397	0.30	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384648	WTRMA002397	15.40	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384667	WTRMA002397	16.29	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384668	WTRMA002397	0.61	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384686	WTRMA002397	0.58	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384687	WTRMA002397	0.58	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384701	WTRMA002449	13.29	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384702	WTRMA002449	2.73	AC	150	1980		0	0	SF - Residential	1	6	3	0	10
384707	WTRMA002360	5.66	AC	200	1980		0	0	Institutional	10	6	3	0	19
384708	WTRMA002360	0.45	AC	200	1980		0	0	SF - Residential	1	6	3	0	10
384863	WTRMA010229	9.50	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
384864	WTRMA010229	4.00	PVC	200	2013		0	0	SF - Residential	1	0	1	0	2
385024	WTRMA004085	109.12	AC	200	1967		0	0	Commercial	8	8	3	0	19
385025	WTRMA004085	109.12	AC	200	1967		0	0	Commercial	8	8	3	0	19
385026	WTRMA004085	109.12	AC	200	1967		0	0	Commercial	8	8	3	0	19
385027	WTRMA004085	109.12	AC	200	1967		0	0	Commercial	8	8	3	0	19
385122	WTRMA000732	17.18	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
385128	WTRMA000732	13.40	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
385134	WTRMA000732	13.39	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
385135	WTRMA000732	13.02	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
385140	WTRMA000735	0.38	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
385141	WTRMA000735	13.39	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
385147	WTRMA000735	13.39	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
385148	WTRMA000735	1.63	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
385155	WTRMA000737	11.77	PVC	200	1986		0	0	SF - Residential	1	4	1	0	6
385161	WTRMA000737	12.59	PVC	200	1986		0	0	Institutional	10	4	1	0	15
385162	WTRMA000737	13.40	PVC	200	1986		0	0	Institutional	10	4	1	0	15
385307	WTRMA002643	1.30	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
385308	WTRMA002643	7.25	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
385425	WTRMA002596	7.70	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
385426	WTRMA002596	7.10	PVC	200	1985		0	0	SF - Residential	1	6	1	0	8
385642	WTRMA003838	10.53	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
385653	WTRMA003838	0.05	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
385654	WTRMA003838	0.50	PVC	200	2003		0	0	SF - Residential	1	2	1	0	4
385695	WTRMA000773	0.50	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
385696	WTRMA000773	0.65	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
385715	WTRMA000773	0.50	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
385716	WTRMA000773	20.39	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
385729	WTRMA000773	0.09	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
385736	WTRMA000773	0.50	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
385737	WTRMA000773	20.10	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
385746	WTRMA000773	0.50	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
385753	WTRMA000773	0.08	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
385754	WTRMA000773	0.50	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
386077	WTRMA000774	0.50	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
386078	WTRMA000774	25.42	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
386127	WTRMA004725	6.38	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
386128	WTRMA004725	23.97	PVC	250	2002		0	0	SF - Residential	1	2	1	0	4
386288	WTRMA002619	12.07	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
386289	WTRMA002619	0.48	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
386757	WTRMA007492	14.32	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
386758	WTRMA007492	16.66	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
386773	WTRMA007492	23.77	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
386774	WTRMA007492	13.75	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
386997	WTRMA004490	73.82	PVC	250	2007		0	0	Institutional	10	0	1	0	11
387003	WTRMA004490	6.60	PVC	250	2007		0	0	Institutional	10	0	1	0	11
387004	WTRMA004490	0.50	PVC	250	2007		0	0	Institutional	10	0	1	0	11
387186	WTRMA003588	1.21	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
387187	WTRMA003588	4.58	PVC	200	2006		0	0	SF - Residential	1	0	1	0	2
387210	WTRMA000765	38.34	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
387211	WTRMA000765	1.92	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
387223	WTRMA003842	0.56	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
387224	WTRMA003842	13.62	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
387280	WTRMA004723	0.50	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
387281	WTRMA004723	2.83	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
387446	WTRMA001449	1.31	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
387447	WTRMA001449	15.94	PVC	300	2003		0	0	SF - Residential	1	2	1	0	4
387823	WTRMA000889	50.44	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
387824	WTRMA000889	0.54	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
387845	WTRMA000886	33.88	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
387846	WTRMA000886	0.01	PVC	200	1999		0	0	SF - Residential	1	2	1	0	4
387967	WTRMA003039	19.51	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
387968	WTRMA003039	4.80	PVC	250	1987		0	0	SF - Residential	1	4	1	0	6
388275	WTRMA001812	2.97	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
388276	WTRMA001812	8.29	PVC	400	2001		0	0	SF - Residential	6	2	1	0	9
388388	WTRMA001970	19.13	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
388389	WTRMA001970	8.69	PVC	400	2004		0	0	SF - Residential	6	2	1	0	9
388504	WTRMA001797	6.22	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
388505	WTRMA001797	22.04	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
388624	WTRMA001888	19.54	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
388625	WTRMA001888	4.04	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
388714	WTRMA001653	17.00	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
388715	WTRMA001653	13.50	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
388774	WTRMA005839	0.34	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
388775	WTRMA005839	35.98	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
388840	WTRMA002135	0.81	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
388841	WTRMA002135	16.07	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
388847	WTRMA002139	6.41	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
388848	WTRMA002139	9.88	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
388862	WTRMA002146	5.10	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
388863	WTRMA002146	12.40	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
388868	WTRMA002143	16.99	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
388869	WTRMA002143	0.35	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
388878	WTRMA001853	0.61	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
388879	WTRMA001853	3.35	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
389246	WTRMA004079	10.34	AC	250	1974		0	0	Institutional	10	8	3	0	21
389247	WTRMA004079	20.22	AC	250	1974		1	6	Institutional	10	8	3	0	27
389480	WTRMA002622	4.58	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
389481	WTRMA002622	7.10	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
389487	WTRMA002622	13.69	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
389488	WTRMA002622	12.59	PVC	150	1985		0	0	SF - Residential	1	6	1	0	8
389545	WTRMA002632	1.61	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
389546	WTRMA002632	9.37	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
389558	WTRMA002632	6.22	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
389559	WTRMA002632	14.94	PVC	400	1985		0	0	SF - Residential	6	6	1	0	13
389648	WTRMA000918	4.25	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
389649	WTRMA000918	6.90	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
389655	WTRMA000879	0.75	PVC	150	2000		0	0	SF - Residential	1	2	1	0	4
389656	WTRMA000879	5.59	PVC	150	2000		0	0	SF - Residential	1	2	1	0	4
389754	WTRMA001526	0.17	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
389852	WTRMA000728	0.50	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
389853	WTRMA000728	26.09	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
389860	WTRMA000728	3.03	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
389867	WTRMA000728	25.52	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
389868	WTRMA000728	0.43	PVC	250	2001		0	0	SF - Residential	1	2	1	0	4
389884	WTRMA007492	19.12	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
389885	WTRMA007492	1.83	PVC	400	2007		0	0	SF - Residential	6	0	1	0	7
389893	WTRMA005810	5.47	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
389905	WTRMA005810	29.90	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
389916	WTRMA010767	3.24	PVC	200	2010		0	0	SF - Residential	1	0	1	0	2
389935	WTRMA004196	9.44	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
389936	WTRMA004196	0.45	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
389942	WTRMA003610	23.08	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
389943	WTRMA003610	21.98	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
389997	WTRMA001924	4.00	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
389998	WTRMA001924	0.00	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
390014	WTRMA006745	7.84	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
390015	WTRMA006745	23.85	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
390016	WTRMA006745	19.50	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
390017	WTRMA006745	14.35	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
390018	WTRMA006745	48.60	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
390019	WTRMA006745	12.61	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
390020	WTRMA006745	11.80	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
390067	WTRMA000624	4.36	PVC	300	2012		0	0	Commercial	8	0	1	0	9

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
390075	WTRMA000624	8.55	PVC	300	2012		0	0	Commercial	8	0	1	0	9
390087	WTRMA000624	4.67	PVC	300	2012		0	0	Commercial	8	0	1	0	9
390095	WTRMA000624	16.00	PVC	300	2012		0	0	Commercial	8	0	1	0	9
390113	WTRMA000624	87.41	PVC	300	2012		0	0	Commercial	8	0	1	0	9
390125	WTRMA000624	15.79	PVC	300	2012		0	0	Commercial	8	0	1	0	9
390126	WTRMA000624	9.66	PVC	300	2012		0	0	Commercial	8	0	1	0	9
390176	WTRMA003947	70.59	CI	150	1954		1	6	Commercial and residential	8	12	10	0	36
390177	WTRMA003947	23.87	CI	150	1954		0	0	Commercial and residential	8	12	10	0	30
390184	WTRMA010779	16.74	AC	150			0	0	Parks, open space, and trails	1	0	3	0	4
390190	WTRMA010780	68.00	AC	150			0	0	Parks, open space, and trails	1	0	3	0	4
390206	WTRMA010781	11.00	AC	150			0	0	Parks, open space, and trails	1	0	3	0	4
390207	WTRMA010781	17.65	AC	150			0	0	Parks, open space, and trails	1	0	3	0	4
390217	WTRMA010783	47.99	AC	150			0	0	Parks, open space, and trails	1	0	3	0	4
390223	WTRMA010784	79.98	AC	150			0	0	Institutional	10	0	3	0	13
390240	WTRMA010785	24.59	AC	150			0	0	Institutional	10	0	3	0	13
390261	WTRMA010788	63.98	AC	150			0	0	Institutional	10	0	3	0	13
390280	WTRMA010787	8.38	AC	150			0	0	Institutional	10	0	3	0	13
390347	WTRMA010793	63.98	AC	150			0	0	Institutional	10	0	3	0	13
390364	WTRMA010792	21.38	AC	150			0	0	Institutional	10	0	3	0	13
390401	WTRMA010796	86.03	AC	150			0	0	Institutional	10	0	3	0	13
390407	WTRMA010797	112.87	AC	150			0	0	Institutional	10	0	3	0	13
390411	WTRMA010798	18.16	PVC	300			0	0	Institutional	10	0	1	0	11
390415	WTRMA010799	86.36	AC	150			0	0	Institutional	10	0	3	0	13
390430	WTRMA010802	43.60	AC	150			0	0	Institutional	10	0	3	0	13
390434	WTRMA010803	50.38	AC	150			0	0	Institutional	10	0	3	0	13
390438	WTRMA010804	122.80	AC	150			0	0	Institutional	10	0	3	0	13
390442	WTRMA010805	7.77	AC	150			0	0	Institutional	10	0	3	0	13
390446	WTRMA010806	18.99	AC	150			0	0	Institutional	10	0	3	0	13
390450	WTRMA010807	106.66	AC	150			0	0	Institutional	10	0	3	0	13
390454	WTRMA010808	52.91	AC	150			0	0	Institutional	10	0	3	0	13
390519	WTRMA004539	2.97	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
390520	WTRMA004539	15.94	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
390521	WTRMA004539	10.84	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
390533	WTRMA004539	22.10	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
390534	WTRMA004539	3.76	PVC	250	2007		0	0	SF - Residential	1	0	1	0	2
390956	WTRMA004748	11.45	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
390957	WTRMA004748	0.82	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
391003	WTRMA004738	2.79	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391031	WTRMA004738	1.31	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391032	WTRMA004738	2.38	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391056	WTRMA004749	27.81	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
391057	WTRMA004749	26.35	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
391072	WTRMA004749	12.79	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
391092	WTRMA004749	4.99	PVC	400	2006		0	0	SF - Residential	6	0	1	0	7
391112	WTRMA001828	2.40	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
391135	WTRMA001823	16.54	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
391152	WTRMA001823	13.42	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
391175	WTRMA001823	30.01	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
391195	WTRMA001823	23.99	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
391196	WTRMA001823	28.98	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
391221	WTRMA005114	5.05	PVC	400	1999		0	0	Institutional	15	2	1	0	18
391222	WTRMA005114	1.01	PVC	400	1999		0	0	SF - Residential	6	2	1	0	9
391237	WTRMA001827	19.12	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
391253	WTRMA001827	27.72	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
391262	WTRMA001827	7.75	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
391270	WTRMA001827	21.50	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
391278	WTRMA001827	29.99	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
391279	WTRMA001827	36.38	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
391334	WTRMA004738	1.47	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391335	WTRMA004738	29.23	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391359	WTRMA004738	1.99	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391360	WTRMA004738	0.78	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391379	WTRMA004735	23.18	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391386	WTRMA004735	2.31	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391412	WTRMA004735	1.51	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391413	WTRMA004735	17.85	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391441	WTRMA004735	22.67	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391442	WTRMA004735	1.96	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391459	WTRMA004735	24.98	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
391460	WTRMA004735	2.17	PVC	400	2005		0	0	SF - Residential	6	2	1	0	9
393438	WTRMA010862	83.51	PVC	250	2005		0	0	Industrial	7	2	1	0	10
393442	WTRMA010863	77.50	PVC	250	2005		0	0	Industrial	7	2	1	0	10
393473	WTRMA010867	26.32	PVC	250	2005		0	0	Industrial	7	2	1	0	10
393477	WTRMA010868	24.00	PVC	250	2005		0	0	Industrial	7	2	1	0	10
393503	WTRMA010871	9.46	PVC	250	2005		0	0	Industrial	7	2	1	0	10
393517	WTRMA010873	7.50	PVC	250	2005		0	0	Industrial	7	2	1	0	10
393518	WTRMA010873	27.50	PVC	250	2005		0	0	Industrial	7	2	1	0	10
393525	WTRMA010872	91.81	PVC	250	2005		0	0	Industrial	7	2	1	0	10
393526	WTRMA010872	39.50	PVC	250	2005		0	0	Industrial	7	2	1	0	10
393561	WTRMA010878	6.10	PVC	150	2005		0	0	Industrial	7	2	1	0	10
393628	WTRMA001843	1.28	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393648	WTRMA001843	28.00	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
393667	WTRMA001843	2.01	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
393668	WTRMA001843	22.75	PVC	250	2005		0	0	SF - Residential	1	2	1	0	4
393720	WTRMA001844	12.19	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393744	WTRMA001844	25.99	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393751	WTRMA001844	2.28	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393817	WTRMA001844	3.52	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393818	WTRMA001844	1.20	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393839	WTRMA001844	7.99	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
393840	WTRMA001844	15.99	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393847	WTRMA001844	8.43	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393848	WTRMA001844	18.56	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393855	WTRMA001844	2.90	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393856	WTRMA001844	0.21	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393923	WTRMA001855	0.15	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393938	WTRMA001855	13.22	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393953	WTRMA001855	0.31	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393969	WTRMA010913	10.19					0	0	SF - Residential	1	0	0	0	1
393975	WTRMA001857	9.05	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
393983	WTRMA010914	10.15					0	0	SF - Residential	1	0	0	0	1
393991	WTRMA001808	3.50	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
393992	WTRMA001808	27.13	PVC	200	2001		0	0	SF - Residential	1	2	1	0	4
394000	WTRMA001856	14.71	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394007	WTRMA001862	14.64	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394008	WTRMA001862	15.02	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394016	WTRMA001861	2.39	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394024	WTRMA001861	12.40	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394032	WTRMA001861	8.39	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394039	WTRMA001861	14.99	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394040	WTRMA001861	25.63	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394047	WTRMA001861	8.40	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394048	WTRMA001861	15.23	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394089	WTRMA001856	12.61	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394107	WTRMA001856	12.71	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394147	WTRMA001861	21.59	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394209	WTRMA001856	16.36	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394251	WTRMA001856	18.77	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394265	WTRMA010943	5.48	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
394269	WTRMA010944	9.91	PVC	150	2006		0	0	SF - Residential	1	0	1	0	2
394281	WTRMA003732	15.45	PVC	250	2007		0	0	Industrial	7	0	1	0	8
394296	WTRMA003732	87.50	PVC	250	2007		0	0	Industrial	7	0	1	0	8
394337	WTRMA003732	1.80	PVC	250	2007		0	0	Industrial	7	0	1	0	8
394338	WTRMA003732	2.93	PVC	250	2007		0	0	Industrial	7	0	1	0	8
394348	WTRMA003736	80.27	PVC	250	2007		0	0	Industrial	7	0	1	0	8
394349	WTRMA003736	7.09	PVC	250	2007		0	0	Industrial	7	0	1	0	8
394379	WTRMA003744	3.08	PVC	250	2007		0	0	Industrial	7	0	1	0	8
394380	WTRMA003744	85.57	PVC	250	2007		0	0	Industrial	7	0	1	0	8
394408	WTRMA001829	2.16	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394409	WTRMA001829	9.43	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394426	WTRMA003744	11.38	PVC	250	2007		0	0	Industrial	7	0	1	0	8
394427	WTRMA003744	5.70	PVC	250	2007		0	0	Industrial	7	0	1	0	8
394438	WTRMA001845	5.94	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394439	WTRMA001845	2.25	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394446	WTRMA001848	1.81	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394447	WTRMA001848	16.03	PVC	200	2005		0	0	SF - Residential	1	2	1	0	4
394545	WTRMA010967	6.14	PVC	300			0	0	Commercial	8	0	1	0	9
394555	WTRMA001694	29.48	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
394579	WTRMA001694	2.11	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
394594	WTRMA010964	22.78	PVC	300			0	0	Commercial	8	0	1	0	9
394595	WTRMA010964	19.62	PVC	300			0	0	Commercial	8	0	1	0	9
394606	WTRMA001694	7.30	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
394607	WTRMA001694	28.70	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
394622	WTRMA001694	7.79	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
394630	WTRMA001694	20.28	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
394637	WTRMA001694	4.28	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
394638	WTRMA001694	12.74	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
394681	WTRMA010965	67.15	PVC	300			0	0	Commercial	8	0	1	0	9
394682	WTRMA010965	59.01	PVC	300			0	0	Commercial	8	0	1	0	9
394746	WTRMA001694	25.69	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
394795	WTRMA010966	47.52	PVC	300			0	0	Commercial	8	0	1	0	9
394796	WTRMA010966	23.10	PVC	300			0	0	Commercial	8	0	1	0	9
394816	WTRMA001699	19.71	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
394853	WTRMA001699	11.47	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
394854	WTRMA001699	34.08	PVC	300	1998		0	0	SF - Residential	1	2	1	0	4
394930	WTRMA001740	28.35	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
394939	WTRMA001740	11.30	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
394940	WTRMA001740	0.01	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
394948	WTRMA001742	31.64	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
394956	WTRMA001742	2.24	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
394964	WTRMA001742	30.26	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
394972	WTRMA001742	3.99	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
394980	WTRMA001742	25.03	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
394981	WTRMA001742	22.92	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
394988	WTRMA001742	3.68	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
394989	WTRMA001742	5.59	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395085	WTRMA001740	18.12	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395092	WTRMA001740	12.69	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395093	WTRMA001740	0.73	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395106	WTRMA011013	5.60					0	0	SF - Residential	1	0	0	0	1
395112	WTRMA001754	38.22	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395113	WTRMA001754	27.25	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395147	WTRMA001735	11.31	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395148	WTRMA001735	32.98	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395188	WTRMA001730	3.44	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395196	WTRMA001730	17.92	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395204	WTRMA001730	7.57	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395212	WTRMA001730	26.58	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395220	WTRMA001730	4.10	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395228	WTRMA001730	30.84	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395236	WTRMA001730	0.51	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395244	WTRMA001730	30.65	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395252	WTRMA001730	5.34	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395260	WTRMA001730	24.31	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395267	WTRMA001730	7.72	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395268	WTRMA001730	10.70	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395397	WTRMA001723	3.10	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395398	WTRMA001723	3.10	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
395405	WTRMA001720	21.07	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395406	WTRMA001720	35.26	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395457	WTRMA001752	11.29	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395458	WTRMA001752	32.76	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395465	WTRMA001752	25.39	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395473	WTRMA001752	6.81	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395481	WTRMA001752	25.77	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395482	WTRMA001752	2.79	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395590	WTRMA001749	24.64	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395595	WTRMA001749	25.39	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395596	WTRMA001749	10.37	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395610	WTRMA001759	2.91	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395618	WTRMA001759	24.80	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395626	WTRMA001759	5.29	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395634	WTRMA001759	32.98	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395642	WTRMA001759	2.08	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395649	WTRMA001759	10.96	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395650	WTRMA001759	41.17	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395734	WTRMA001764	4.76	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395742	WTRMA001764	35.11	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395750	WTRMA001764	1.02	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395758	WTRMA001764	22.09	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395765	WTRMA001764	5.93	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395766	WTRMA001764	6.28	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395850	WTRMA001769	4.52	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395858	WTRMA001769	0.78	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395866	WTRMA001769	14.83	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395874	WTRMA001769	12.36	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395882	WTRMA001769	23.08	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395890	WTRMA001769	2.00	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395897	WTRMA001769	0.29	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395898	WTRMA001769	3.26	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395967	WTRMA001726	5.84	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395968	WTRMA001726	5.90	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395976	WTRMA001725	21.56	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395984	WTRMA001725	0.11	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395992	WTRMA001725	30.33	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
395999	WTRMA001725	7.49	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
396000	WTRMA001725	0.23	PVC	200	1998		0	0	SF - Residential	1	2	1	0	4
396052	WTRMA002033	23.25	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
396053	WTRMA002033	7.12	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
396061	WTRMA001685	39.04	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
396069	WTRMA001685	15.32	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
396077	WTRMA001685	25.67	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
396085	WTRMA001685	1.43	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
396086	WTRMA001685	2.52	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
396130	WTRMA001682	9.76	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
396138	WTRMA001682	26.17	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
396145	WTRMA001682	5.58	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
396146	WTRMA001682	28.26	PVC	400	1998		0	0	SF - Residential	6	2	1	0	9
396411	WTRMA001663	0.16	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
396412	WTRMA001663	29.57	PVC	200	1997		0	0	SF - Residential	1	2	1	0	4
396451	WTRMA001679	42.72	PVC	400	1997		0	0	SF - Residential	6	2	1	0	9
396452	WTRMA001679	42.72	PVC	400	1997		0	0	SF - Residential	6	2	1	0	9
396465	WTRMA011117	42.72	PVC	400	1997		0	0	SF - Residential	6	2	1	0	9
396495	WTRMA001872	1.95	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
396504	WTRMA001872	13.76	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
396505	WTRMA001872	9.93	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
396521	WTRMA001871	0.76	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
396583	WTRMA001870	1.83	PVC	300	2002		0	0	SF - Residential	1	2	1	0	4
396771	WTRMA005660	1.42	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396779	WTRMA005660	2.79	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396780	WTRMA005660	19.27	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396794	WTRMA005662	18.25	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396809	WTRMA005662	43.93	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396823	WTRMA005662	25.86	PVC	250	2009		1	6	Commercial	8	0	1	0	15
396824	WTRMA005662	14.30	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396840	WTRMA005670	0.09	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396853	WTRMA005670	7.41	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396854	WTRMA005670	10.38	PVC	250	2009		2	12	Commercial	8	0	1	0	21
396868	WTRMA005670	17.47	PVC	250	2009		2	12	Commercial	8	0	1	0	21
396881	WTRMA005670	9.99	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396895	WTRMA005670	9.92	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396896	WTRMA005670	0.52	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396909	WTRMA005669	10.58	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396923	WTRMA005669	13.69	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396924	WTRMA005669	1.16	PVC	250	2009		0	0	Commercial	8	0	1	0	9
396930	WTRMA001878	6.62	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
396931	WTRMA001878	9.56	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397054	WTRMA001880	2.57	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397055	WTRMA001880	31.13	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397159	WTRMA001883	23.81	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397160	WTRMA001883	20.12	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397243	WTRMA001902	24.42	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397244	WTRMA001902	24.87	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397271	WTRMA001902	3.83	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397272	WTRMA001902	28.74	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397291	WTRMA001902	3.89	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397292	WTRMA001902	1.12	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397328	WTRMA001939	23.07	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397348	WTRMA001940	9.28	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397349	WTRMA001940	3.07	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397358	WTRMA011187	7.21					0	0	SF - Residential	1	0	0	0	1
397364	WTRMA001910	9.05	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397365	WTRMA001910	4.02	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397392	WTRMA001910	14.65	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397393	WTRMA001910	14.94	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397462	WTRMA001909	45.29	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importia_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
397463	WTRMA001909	17.11	PVC	200	2002		0	0	SF - Residential	1	2	1	0	4
397546	WTRMA001602	18.36	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
397547	WTRMA001602	14.54	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
397712	WTRMA001615	3.84	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
397713	WTRMA001615	0.90	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
397729	WTRMA001619	17.59	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
397730	WTRMA001619	0.15	PVC	200	1996		0	0	SF - Residential	1	2	1	0	4
397813	WTRMA001921	29.79	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
397814	WTRMA001921	7.88	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
397830	WTRMA011218	0.71	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
397883	WTRMA011226	9.09			2002		0	0	SF - Residential	1	2	0	0	3
397887	WTRMA011227	9.02			2002		0	0	SF - Residential	1	2	0	0	3
397959	WTRMA001919	28.09	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
397960	WTRMA001919	0.94	PVC	400	2002		0	0	SF - Residential	6	2	1	0	9
397995	WTRMA011241	18.11	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398022	WTRMA011245	12.03	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398095	WTRMA011252	11.23	PVC	200	2014		0	0	Multifamily	5	0	1	0	6
398106	WTRMA011253	2.61	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
398159	WTRMA011258	24.99	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398178	WTRMA011260	18.99	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398184	WTRMA011261	18.97	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398190	WTRMA011262	15.01	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398196	WTRMA011263	7.60	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398202	WTRMA011264	7.53	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398211	WTRMA011265	8.00	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398227	WTRMA011259	23.72	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398240	WTRMA011259	4.08	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398254	WTRMA011259	35.62	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398268	WTRMA011259	4.01	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398269	WTRMA011259	21.36	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398282	WTRMA011257	14.43	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398283	WTRMA011257	3.59	PVC	250	2014		0	0	Multifamily	5	0	1	0	6
398295	WTRMA011256	0.57	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
398310	WTRMA011256	6.49	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
398322	WTRMA011256	19.47	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
398323	WTRMA011256	18.96	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
398353	WTRMA011243	0.00	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398354	WTRMA011243	1.80	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398371	WTRMA011243	1.35	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398440	WTRMA011243	3.73	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398451	WTRMA011243	10.65	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398452	WTRMA011243	0.66	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398465	WTRMA011243	3.36	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398466	WTRMA011243	25.19	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398505	WTRMA011242	7.05	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398506	WTRMA011242	2.71	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398516	WTRMA011243	6.49	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398529	WTRMA011243	19.83	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398530	WTRMA011243	4.14	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398544	WTRMA011246	0.47	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398557	WTRMA011246	2.55	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398558	WTRMA011246	4.30	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398571	WTRMA011247	17.93	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398585	WTRMA011247	4.02	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398599	WTRMA011247	9.23	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398600	WTRMA011247	2.64	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398613	WTRMA011248	4.20	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398627	WTRMA011248	1.32	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398641	WTRMA011248	4.18	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398669	WTRMA011251	3.99	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398670	WTRMA011251	13.79	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398683	WTRMA011251	1.77	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398684	WTRMA011251	1.19	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398697	WTRMA011248	20.49	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398698	WTRMA011248	2.88	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398707	WTRMA011302	40.00	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
398773	WTRMA011309	12.03	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398813	WTRMA011314	17.96	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
398893	WTRMA011303	2.39	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
398906	WTRMA011305	9.54	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
398923	WTRMA011303	14.61	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
398924	WTRMA011303	13.42	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
398952	WTRMA011304	9.04	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
398966	WTRMA011304	4.00	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
398967	WTRMA011304	5.77	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399035	WTRMA011305	10.52	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399048	WTRMA011305	3.89	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399061	WTRMA011306	15.19	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399075	WTRMA011305	1.64	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399089	WTRMA011306	0.64	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399090	WTRMA011306	2.68	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399103	WTRMA011305	3.13	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399104	WTRMA011305	15.69	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399118	WTRMA011307	2.99	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399131	WTRMA011307	4.00	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399143	WTRMA011307	4.59	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399157	WTRMA011307	4.11	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399198	WTRMA011307	3.19	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399199	WTRMA011307	17.22	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399212	WTRMA011307	2.28	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399213	WTRMA011307	0.96	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399222	WTRMA001828	2.40	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
399223	WTRMA001828	1.22	PVC	400	2000		0	0	SF - Residential	6	2	1	0	9
399290	WTRMA011307	3.42	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399303	WTRMA011307	0.33	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399319	WTRMA011307	3.57	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399320	WTRMA011307	20.18	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399334	WTRMA011307	16.88	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2

Note: The pipes as labelled in the map refer to the GISFID number.

Table D1: Condition Assessment Database

GISFID	NAME_NUMBE	LENGTH	MATERIAL	DIAMETER_N	DATE_INSTA	DATE_ABND	Breaks	Breaks_Pt	LandUse	Importa_Pt	Age_Pts	Materi_Pts	Histor_Pts	Total_Pts
399348	WTRMA011307	4.03	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399373	WTRMA011307	4.05	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399374	WTRMA011307	5.39	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399387	WTRMA011307	5.11	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399388	WTRMA011307	8.35	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399415	WTRMA011310	19.51	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399428	WTRMA011310	4.00	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399439	WTRMA011310	7.29	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399440	WTRMA011310	15.51	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399472	WTRMA011311	4.09	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399473	WTRMA011311	3.24	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399486	WTRMA011311	3.00	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399500	WTRMA011311	4.22	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399501	WTRMA011311	16.13	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399544	WTRMA011312	2.86	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399545	WTRMA011312	12.32	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399570	WTRMA011312	3.93	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399571	WTRMA011312	9.24	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399627	WTRMA011313	0.02	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399641	WTRMA011313	4.05	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399642	WTRMA011313	0.42	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399657	WTRMA011312	3.65	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399658	WTRMA011312	15.85	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399687	WTRMA011313	3.90	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399700	WTRMA011313	20.11	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399713	WTRMA011313	0.78	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399714	WTRMA011313	3.99	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399727	WTRMA011313	3.66	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399742	WTRMA011313	15.25	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399755	WTRMA011313	5.81	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399756	WTRMA011313	3.94	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399784	WTRMA011372	13.36	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399790	WTRMA011373	6.31	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399808	WTRMA011375	17.92	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399836	WTRMA011377	1.09	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399844	WTRMA011378	8.52	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399853	WTRMA011379	11.40	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399859	WTRMA011380	5.00	PVC	200	2014		0	0	SF - Residential	1	0	1	0	2
399872	WTRMA011308	1.80	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399884	WTRMA011308	11.10	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399885	WTRMA011308	4.12	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399907	WTRMA011374	51.87	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399908	WTRMA011374	22.19	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399921	WTRMA011376	22.32	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2
399922	WTRMA011376	21.71	PVC	250	2014		0	0	SF - Residential	1	0	1	0	2