Acheson & Big Lake Area Water System Study – 2022 Update

Final Report

Parkland County

60662782

November 2022

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November 23, 2022

Project #
60662782

Subject: Acheson & Big Lake Area Water System Study – 2022 Update
Final Report

Dear Brandi:

AECOM is pleased to submit our final report for the Acheson and Big Lake Area Water System Study. Comments received through the draft submissions have been incorporated.

Sincerely,
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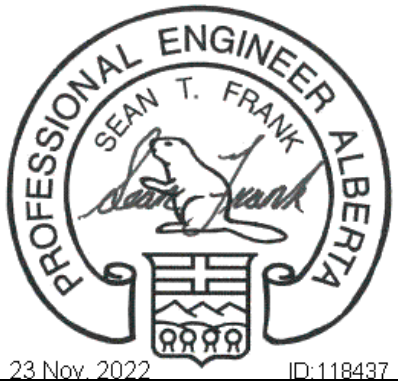

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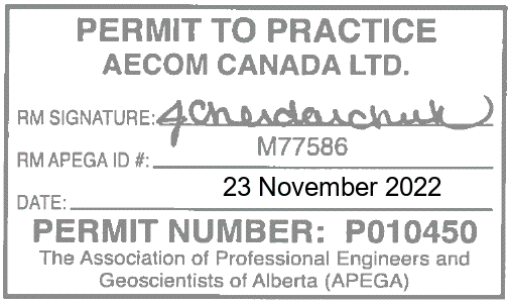

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2	September 20, 2022	AH, SF	Final Draft Report
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Table of Contents

1. Introduction 1
1.1 Background 1
1.2 Scope of Work 1

2. Study Data 3
2.1 Study Area 3
2.2 Land Use 3
2.3 Development Staging Scenarios 4
2.4 Population Data 4
2.5 Data Collection 5

3. Existing System Assessment 11
3.1 System Description 11
3.1.1 Supply System 11
3.1.2 Existing System Reservoirs 12
3.1.3 Existing System Pumping 12
3.1.4 Existing Operation Philosophy 13
3.1.5 Distribution System 14
3.2 Water Consumption Data 19
3.3 Model Development 21
3.3.1 Model Calibration 22
3.3.2 Design Criteria 28
3.3.2.1 Residential Areas 28
3.3.2.2 Industrial Areas 28
3.3.2.3 Peaking Factors 29
3.3.2.4 Fire Flows 30
3.3.2.5 Pipe Size Requirements 30
3.3.2.6 Pipe Velocity Requirements 30
3.3.2.7 Minimum Pressure Requirements 30
3.3.2.8 Private Fire Pumps 31
3.3.2.9 Design Criteria Summary 32
3.3.3 System Demand Summary 33
3.4 Existing System Evaluation 33
3.4.1 Existing Storage Capacity Assessment 34
3.4.2 Existing Pumping Capacity Assessment 35
3.4.3 System Evaluation for Existing Development Conditions 35
3.4.3.1 Existing System Analysis - Average Day Demand 36
3.4.3.2 Existing System Analysis – Maximum Day Demand plus Fire 37
3.4.3.3 Existing System Analysis - Peak Hour Demand 38
3.5 System Improvements 42
3.5.1 System Deficiencies 42
3.5.2 Existing System with Improvements – Analysis 43

4. Future Development Servicing 48
4.1 Water Demand Projection 48
4.2 Future Storage Requirement 48

4.3 Future Pumping Requirement 50
4.4 Future Pressure Zones and PRVs 51
4.5 Hydraulic Assessment 53
4.5.1 Near Future Water Distribution System 53
4.5.2 Near Future Improvements Summary 54
4.5.3 Long Term Water Distribution System 60
4.5.4 Zone 3 West Pumphouse Sizing 61
4.5.5 Long Term Improvements Summary 62
4.5.6 Ultimate Water Distribution System 67
4.5.7 Ultimate Development Improvements Summary 68
4.6 Comparison to Previous Study - Improvement Summary 68

5. Storage Upgrade Implementation Plan 73

6. Water Age Analysis 75

6.1 General 75
6.2 Model Development 75
6.3 Existing System Evaluation 76

7. Cost Estimates 80

7.1.1 Cost Estimates 80
7.1.1.1 Storage Reservoirs 80
7.1.1.2 Pumps 80
7.1.1.3 Distribution Mains 81
7.1.1.4 Pressure Reducing Valves 82

8. Conclusions and Recommendations 84

8.1 Existing Water Distribution System 84
8.2 Near Future Water Distribution System 84
8.3 Long Term Water Distribution System 85
8.4 Ultimate Water Distribution System 85
8.5 Storage and Pumping 86
8.6 Water Age Analysis 87

Figures

Figure 2.1 Study Area 7
Figure 2.2 Existing Topography 8
Figure 2.3 Land Use ASP Areas 9
Figure 2.4 Development Staging 10
Figure 3.1 Existing Water Distribution System 16
Figure 3.2 Existing Water Distribution System – Pipe Materials 17
Figure 3.3 Existing Water Distribution System – Pressure Zones and PRVs 18
Figure 3.4 Hydrant Test Locations 27
Figure 3.5 Existing Water Distribution System Results – Average Day Demand 39
Figure 3.6 Existing Water Distribution System Results – Maximum Day Demand Plus Fire Flow 40
Figure 3.7 Existing Water Distribution System Results – Peak Hour Demand 41

Figure 3.8 Existing Water Distribution System with Improvements 45
Figure 3.9 Existing Water Distribution System with Improvements Results – Average Day Demand 46
Figure 3.10 Existing Water Distribution System with Improvements Results – Maximum Day Demand Plus Fire Flow 47
Figure 4.1 Ultimate Water Distribution System - Future Pressure Zones and PRVs 52
Figure 4.2 Near Future Water Distribution System 56
Figure 4.3 Near Future Water Distribution System Results Average Day Demand 57
Figure 4.4 Near Future Water Distribution System Results Maximum Day Demand Plus Fire Flow 58
Figure 4.5 Near Future Water Distribution System Results Peak Hour Demand 59
Figure 4.6 Long Term Water Distribution System 63
Figure 4.7 Long Term Water Distribution System Results Average Day Demand 64
Figure 4.8 Long Term Water Distribution System Results Maximum Day Demand Plus Fire Flow 65
Figure 4.9 Long Term Water Distribution System Results Peak Hour Demand 66
Figure 4.10 Ultimate Water Distribution System 69
Figure 4.11 Ultimate Water Distribution System Results Average Day Demand 70
Figure 4.12 Ultimate Water Distribution System Results Maximum Day Demand Plus Fire Flow 71
Figure 4.13 Ultimate Water Distribution System Results Peak Hour Demand 72
Figure 6.1 Diurnal Flow Curves 78
Figure 6.2 Existing Water Distribution System – Water Age 79

Tables

Table 2.1: Population Projections Summary – Big Lake Residential & Osborne Acres 5
Table 3.1: Existing Pump Capacities 13
Table 3.2: Existing System Pressure Settings 15
Table 3.3: CRPWSC Purchasing Data 19
Table 3.4: Pumphouse Log Sheet Summary 20
Table 3.5: Existing Water Consumption and Peaking Factor Summary 20
Table 3.6: Existing Water Consumption Summary 21
Table 3.7: Hydrant Testing Results 22
Table 3.8: 2022 Model using 2016 Study Calibration Coefficients - Pressure Comparison 23
Table 3.9: 2022 Model using 2016 Study Calibration Coefficients - Flow at 140 kPa Comparison 24
Table 3.10: Updated Calibration Coefficients - Pressure Comparison 25
Table 3.11: Updated Calibration Coefficients - Flow at 140 kPa Comparison 25
Table 3.12: Industrial Area Water Consumption Summary 29
Table 3.13: Design Criteria Summary 32
Table 3.14: Water Demand Projection 33
Table 3.15: Existing Storage Requirement – CRPWSC Requirement 34
Table 3.16: Existing Storage Requirement – AEP Requirement 34
Table 3.17: Existing System Analysis – Average Day Demand 36
Table 3.18: Existing System Analysis – PRV Analysis 36
Table 3.19: Existing System Analysis – Maximum Day Demand plus Fire Flow 37
Table 3.20: Existing System Analysis – Peak Hour Demand 38
Table 3.21: Existing System Improvements – PRV Settings 43
Table 3.22: Existing System with Improvements Analysis – Maximum Day Demand plus Fire Flow 43
Table 4.1: Water Demand Projection 48
Table 4.2: CRPWSC Water Storage Requirement for Ultimate Development Condition 49
Table 4.3: CRPWSC Water Storage Requirement for Near Future Development Condition 49

Table 4.4: CRPWSC Water Storage Requirement for Long Term Development Condition 49
Table 4.5: Pumping Requirements 50
Table 4.6: Future PRV Settings 51
Table 4.7: Near Future Development Pressure Assessment 53
Table 4.8: Near Future Development MDD Plus Fire Flow Assessment 54
Table 4.9: Long Term Development Pressure Assessment 60
Table 4.10: Long Term Development MDD Plus Fire Flow Assessment 61
Table 4.11: Long Term Pumping Hydraulic Assessment 61
Table 4.12: Ultimate Development Pressure Assessment 67
Table 4.13: Ultimate Development MDD Plus Fire Flow Assessment 68
Table 5.1: Storage Expansion Staging Summary 74
Table 6.1: Zone 3 & 4 Reservoir Chlorine Concentrations 75
Table 6.2: Existing System Evaluation: Maximum Water Age at Selected Nodes 76
Table 7.1: Acheson Industrial Water Distribution System Cost Estimates 81
Table 7.2: Highway and Railway Crossing Water Distribution System Cost Estimates 81
Table 7.3: Big Lake Residential Water Distribution System Cost Estimates 82
Table 7.4: Water Distribution System Cost Estimate Summary 82
Table 7.5: Pressure Reducing Valves Cost Estimates 83
Table 8.1: Near Future Cost Estimate Summary 85
Table 8.2: Long Term Cost Estimate Summary 85
Table 8.3: Ultimate Cost Estimate Summary 86
Table 8.4: Storage and Pumping Cost Estimate Summary 86

Appendices

Appendix A. Water Distribution Design Standards Comparison
Appendix B. High Demand User Water Consumption
Appendix C. Existing Development Condition Simulation Results
Appendix D. Existing Development Condition + Upgrades Simulation Results
Appendix E. Near Future Development Condition Simulation Results
Appendix F. Long Term Development Condition Simulation Results
Appendix G. Ultimate Development Condition Simulation Results
Appendix H. Water Consumption Demand Projection – Reservoir Triggers
Appendix I. Cost Estimates

List of Acronyms

The following acronyms used in this report are defined as follows:

Abbreviation	Definition
%	Percent
ABLA	Acheson and Big Lake Area
AC	Asbestos Cement
ADD	Average Day Demand
AEP	Alberta Environment & Parks
ASP	Area Structure Plan
C Coefficient	Hazen Williams 'C' coefficient
CRPWSC	Capital Region Parkland Water Services Commission
EPCOR	EPCOR Water Services Inc.
EPS	Extended Period Simulation
ft	Feet
GPM	(United States) Gallons Per Minute
GIS	Geographic Information System
h	Hour
ha	Hectares
HDPE	High Density Polyethylene
HGL	Hydraulic Grade Line
HP	Horsepower
ID	Inside Diameter
km	Kilometre
kPa	Kilopascal
L	Litre
m	Metre
m^3	Cubic Metre
MDD	Maximum Day Demand
mm	Millimetre
PHD	Peak Hour Demand
PRV	Pressure Reducing Valve
psi	Pounds per Square Inch
PVC	Polyvinyl Chloride
s	Second
WILD	West Inter Lake District Water Commission

1. Introduction

1.1 Background

Parkland County has maintained a Water Master Plan for the Acheson and Big Lake Area (ABLA) since 2007, titled Acheson & Big Lake Area Water System Study (the Study). The most recent version of the Study was completed in September 2016 (2016 Study). The goal of this assessment is to update the Study with development that has occurred within the ABLA in the last 6 years, perform a detailed model calibration, validate system recommendations, review system operations and provide recommendations, and provide a road map for future development.

The Acheson and Big Lake areas are located in Parkland County. The Acheson Industrial Area consists of mostly industrial development, whereas the Big Lake area consists entirely of residential development. Highway 16 separates the Big Lake residential development from the Acheson Industrial Area.

The ABLA water distribution system is serviced through two reservoir-pumphouses. The reservoir-pumphouses are both located near the Capital Region Parkland Water Services Commission (CRPWSC) water line that parallels Highway 16A. Since the reservoir-pumphouses are located in Zones 3 and 4 of the Acheson Industrial Area, they are referred to as the Zone 3 and Zone 4 reservoirs, respectively. The topography within the study area generally slopes downwards toward Big Lake, and there are five pressure zones separated by pressure reducing valves (PRVs) to maintain system pressures within desired operating limits.

Since completion of the 2016 Study, Parkland County has expanded the ABLA water distribution system to accommodate additional development, and water consumption trends are shifting, thus requiring a detailed re-evaluation. The new development in the ABLA requires conceptual planning of the water distribution network to allow development to proceed in the most efficient and cost effective manner. In addition, the impact of new development on the Existing System needs to be assessed and necessary improvements identified and implemented. Therefore, AECOM was retained by Parkland County to re-evaluate the existing water distribution system and to develop an updated future water servicing concept.

1.2 Scope of Work

The overall objective of the Study was to develop a water servicing concept for the ABLA to assess the existing system and provide a roadmap for future development. The scope of work included the following:

- Collect and review all the relevant data to the project including background reports, mapping, as-built data of the distribution network, land use data, population data, water consumption data, hydrant flow test information, pumping records, and pump curves for the existing pumps.
- Determine the peaking factors for maximum day and peak hour through a review of historical records.
- Examine the existing methods of operation.
- Confirm and report on present operations and compare to what was reported in previous studies.
- Review Parkland County's Engineering Design Standards and make recommendations regarding the design criteria.
- Verify the existing water system model.
- Conduct hydrant testing throughout the ABLA water distribution system.
- Utilize the hydrant testing data to confirm model calibration and update the calibration, as necessary.
- Evaluate the existing water supply and distribution system, identify deficiencies, and recommend and assess system improvements.
- Identify system operating pressures and recommend if changes need to be made throughout the system.
- Identify triggers that warrant reservoir expansion and identify potential locations for expansion.

- Develop a servicing concept to address the existing and future development conditions utilizing WaterCAD hydraulic modelling software.
- Determine supply availability based on the supply agreement with the Capital Region Parkland Water Services Commission.
- Develop a staging and implementation plan for future development.
- Conduct a water age analysis and determine if there are water age issues within the system.
- Develop cost estimates for existing system upgrades, as well as the future development conditions.
- Prepare a report detailing the findings of the Study and the proposed water servicing concept.

2. Study Data

2.1 Study Area

The study area includes the Acheson Industrial Area and Big Lake residential areas. The ABLA is located immediately west of Edmonton and is bordered by the City of Edmonton to the east, City of Spruce Grove to the west, Big Lake and Atim Creek to the north, and Highway 628 to the south. Highway 16 separates the Big Lake and Acheson areas, with the Big Lake residential area to the north, and the Acheson Industrial Area to the south. Highway 60 runs in a north-south direction through the study area. The entire study area covers approximately 7,700 hectares. The study area is shown in Figure 2.1; the figure also includes the eight economic zones within the Acheson Industrial Area.

The ground topography of the ABLA, in general, slopes from south to north towards Big Lake. The maximum ground elevation is approximately 730 m in the south end of Zones 7 and 8, and the minimum ground elevation is approximately 650 m near Lois Hole Centennial Provincial Park and Big Lake. The existing topography is shown on Figure 2.2.

2.2 Land Use

For the portion of the study area north of Highway 16, the Big Lake Area Structure Plan (ASP) July 2013 Consolidation generally identifies these lands as being county residential with pockets of neighbourhood commercial areas. For the area south of Highway 16, the 2020 Acheson Industrial Area Structure Plan future land use concept identifies the lands as being primarily industrial and commercial/light industrial. The 2020 Acheson Industrial ASP also identifies; two special study areas, two recreational areas, the existing Osborne Acres residential subdivision and its surrounding 200 m development restriction area, as well as the Wagner Natural Area. The ASPs, available on www.parklandcounty.com, contain detailed maps of the land uses described above. For the purposes of this Study, it is assumed the entire area south of Highway 16, with the exception of the Wagner Natural Area, will eventually be developed with full water servicing. The ASP areas are shown on Figure 2.3.

The Atim Creek / Big Lake Floodplain Overlay, identified in Section 10.2 of Parkland County's Land Use Bylaw No. 2017-18, was used to create the boundary between the proposed unserviced lands (Open Space, Golf Courses and Lois Hole Provincial Park) to the north and the serviced country residential area to the south. This overlay is defined as the 1:100 year Flood Plain for Big Lake plus 0.5 m consistent with the Big Lake Basin Task Force: Floodplain Delineation for Atim Creek from Campsite Road to Big Lake Study (Sameng, 2007), and is shown on Figure 2.3. The overlay restricts land use in the area north of the 1:100 year + 0.5 m boundary, regardless of the underlying land use district. Therefore, for the purposes of this Study, the lands north of the defined boundary were not considered to be developable lands.

Since the area to the south of the Wagner Natural Area is located in the Natural Area's groundwater recharge zone, as indicated on Figure 2.3, care must be taken when developing in this area to ensure that groundwater recharge is not interrupted nor affected. Developers will need to undertake necessary subsurface investigation, under the supervision of a Professional member experienced in hydrogeology, to ensure proposed underground infrastructure has no significant long-term impact on the groundwater flow system of the Wagner Natural Area.

Also, developers need to be aware of the potential for both active and unforeseen groundwater flow conditions in and around the Wagner Natural Area. Active groundwater conditions include, but are not limited to: high water tables, flowing artesian conditions, and strong upward water flow. Furthermore, the area in and around the Wagner Natural Area is known to have buried sand channels with no surface expression. These buried channels are focal points for groundwater flow and could pose potential problems associated with pipeline construction. For this Study, it was assumed that the development within this area would be developed with full water servicing similar to the other industrial areas.

2.3 Development Staging Scenarios

For this Study, Parkland County's Planning and Engineering Departments recommended the following four development staging scenarios, shown on Figure 2.4, be considered and modelled as having full water servicing:

- Existing development (having water service in 2022)
- Near Future development (next 5-10 years)
- Long Term development (10 to 25 years)
- Ultimate development (26 years +)

In the Existing development stage, the total serviced area is the sum of all serviced lots within the ABLA that have active water billing accounts in 2022. Serviced lots were considered to be lots with metered water services in 2022; developed lots without an active service were not considered as Existing development. The Near Future and Long Term development areas are expected to be the next greenfield areas to be developed (as estimated by Parkland County's Planning and Engineering Departments) and are either easily serviceable areas, or infill development areas. Easily serviceable areas are defined as lots within developed subdivisions that do not use water servicing to date in 2022 but may have water mains adjacent with service connection stubs available. For residential areas, these are typically empty lots or partly constructed. For industrial areas, this could be lay down or storage yards, or empty lots not yet constructed on. The Ultimate development scenario considers full build-out of the entire study area and assumes redevelopment of the existing developed area.

It was assumed that 2% of the gross industrial area will be dedicated to roadways, 3% will be dedicated to public utility lots such as stormwater management facilities and 10% will be allocated to reserves (environmental and municipal). The not to be serviced areas also include golf courses, lands within the Atim Creek / Big Lake Overlay Area, and future planned highway expansion areas.

2.4 Population Data

Current population and forecasting data was provided by Parkland County. For residential land uses, a population density of 2.8 persons per dwelling was utilized, consistent with previous studies. Based on the water billing records provided by Parkland County, as of July 2022 there are 606 serviced lots within the Big Lake area (corresponding to 1,051 ha). Using a population density of 2.8 persons per dwelling, the total serviced population within the Big Lake area is 1,696 people. In the 2016 Study, the serviced population was approximately 1,352 people. This equates to a 2.9% growth rate over the last 7 years.

For future residential development in the Big Lake area, a population density of 2 dwellings/gross hectare and 3 persons per dwelling were used to determine the serviced population. The Near Future development scenario includes an additional population of 1,332 people, for a total serviced population of 3,028 people. The Long Term development scenario considers full development of the Big Lake residential area. The additional population for the Long Term scenario is 948 people, for a total serviced population of 3,976. Redevelopment of Osborne Acres provides an additional population 972 persons. Due to the high cost of servicing the lots within Osborne Acres, it is anticipated that the servicing will not be in place until the Ultimate development scenario. Therefore, the serviced

population for the Ultimate development scenario is 4,948. Table 2.1 below outlines the residential population projections for Big Lake and Osborne Acres.

Table 2.1: Population Projections Summary – Big Lake Residential & Osborne Acres

Development Stage	Residential Serviced Area Increase (ha)	Total Residential Serviced Area (ha)	Serviced Population Increase	Total Serviced Population
Existing Development	-	179	-	1,696
Near Future Development	222	401	1,332	3,028
Long Term Development	158	559	948	3,976
Ultimate Development	162	721	972	4,948

2.5 Data Collection

Relevant data was collected and reviewed at the outset of the project. The data collection included the following:

Existing Reports:
- Acheson and Big Lake Area Water Servicing Study 2015, September 2016
- Parkland County Design Standards dated June 2014 Amended March 2015 (to be updated in 2022)
- Development Servicing reports including:
  - Morgan Creek Business Park – Water Network Analysis, May 2015
  - Acheson Commercial Corner – 600 mm Waterline Revision, March 2016
  - Acheson Zone 5: High Demand User Water and Sewer Analysis, November 2016
  - Morgan Creek Business Park – Water Network Analysis Update, March 2017
  - Acheson Water and Sewer Analysis – Hemp Plant (DRAFT), September 2016
  - Morgan Creek Technology Park – Water and Sewer Servicing Assessment, April 2019
  - Proposed Acheson Hotel – Water and Sanitary Servicing Assessment, March 2020
  - CRPWSC 5 Year Water Projection Update, July 2020
  - Zone 4 Reservoir CRPWSC Transmission Main Service Connection Update, September 2020
  - Zone 3 West Reservoir CRPWSC Transmission Main Connection to 600 mm Twinned Line, September 2020
- Acheson Zone 4 Reservoir Expansion Preliminary Design Report, October 2019
- 2020 Off-Site Levy Annual Report (By-Law No. 2015-07)

Growth Data:
- Population and land use data
- ABLA Area Structure Plan (ASP) information
- Development forecasts

Infrastructure Plans and Drawings:
- As-built drawings of water infrastructure constructed and proposed since 2016
- GIS information
- LiDAR Data
- Future road concept studies for more detailed alignments and servicing constraints

System Models:
- The 2016 WaterCAD model of the Parkland County ABLA water distribution system

Water Consumption, Flow and Hydrant Testing Data:

- Pumphouse operations philosophy and set points
- CRPWSC monthly purchasing Data since the previous Master Plan Update.
- Water Consumption Data from Purchases within Acheson and Big Lake tied to Parcels in GIS from 2016 to 2022.
- Detailed SCADA reservoir flow and level data from the Zone 3 and Zone 4 pumphouses from June through October 2021
- Daily pumphouse logs from Parkland County Operations
- 2021 & 2022 Hydrant flow testing data

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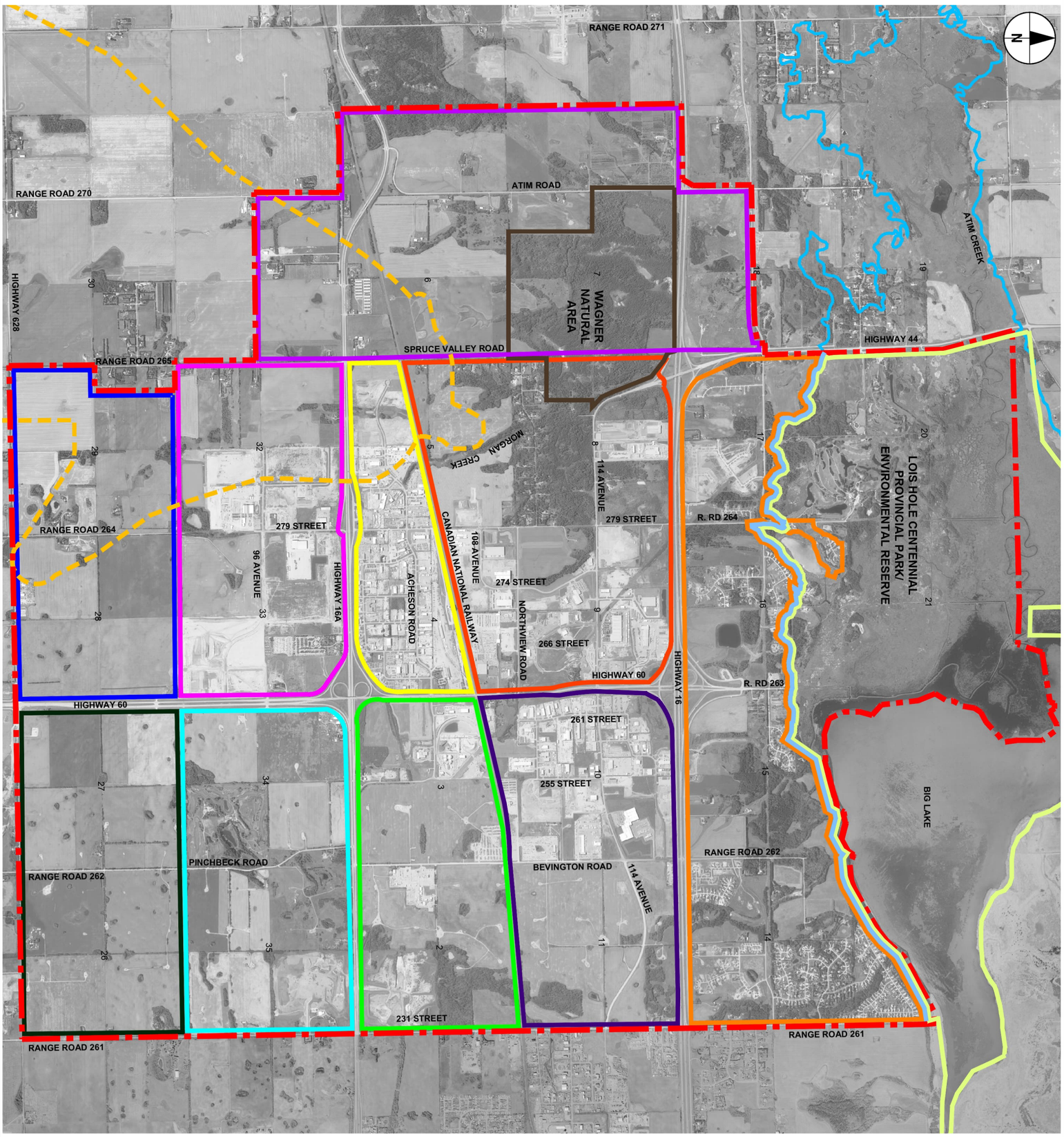

LEGEND

- STUDY AREA
- 10 QUARTER SECTION NUMBER
- BIG LAKE FLOOD DELINEATION (1:100 YEAR FLOOD)
- WAGNER NATURAL AREA
- LOIS HOLE CENTENNIAL PROVINCIAL PARK / ENVIRONMENTAL RESERVE
- WAGNER NATURAL AREA GROUNDWATER RECHARGE ZONE
- ZONE 1
- ZONE 2
- ZONE 3
- ZONE 4
- ZONE 5
- ZONE 6
- ZONE 7
- ZONE 8
- ACHESON WEST AREA
- BIG LAKE AREA STRUCTURE PLAN (MODIFIED TO FOLLOW THE BIG LAKE 1:100 YEAR FLOOD DELINEATION)

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0 1000 2000 m

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
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STUDY AREA

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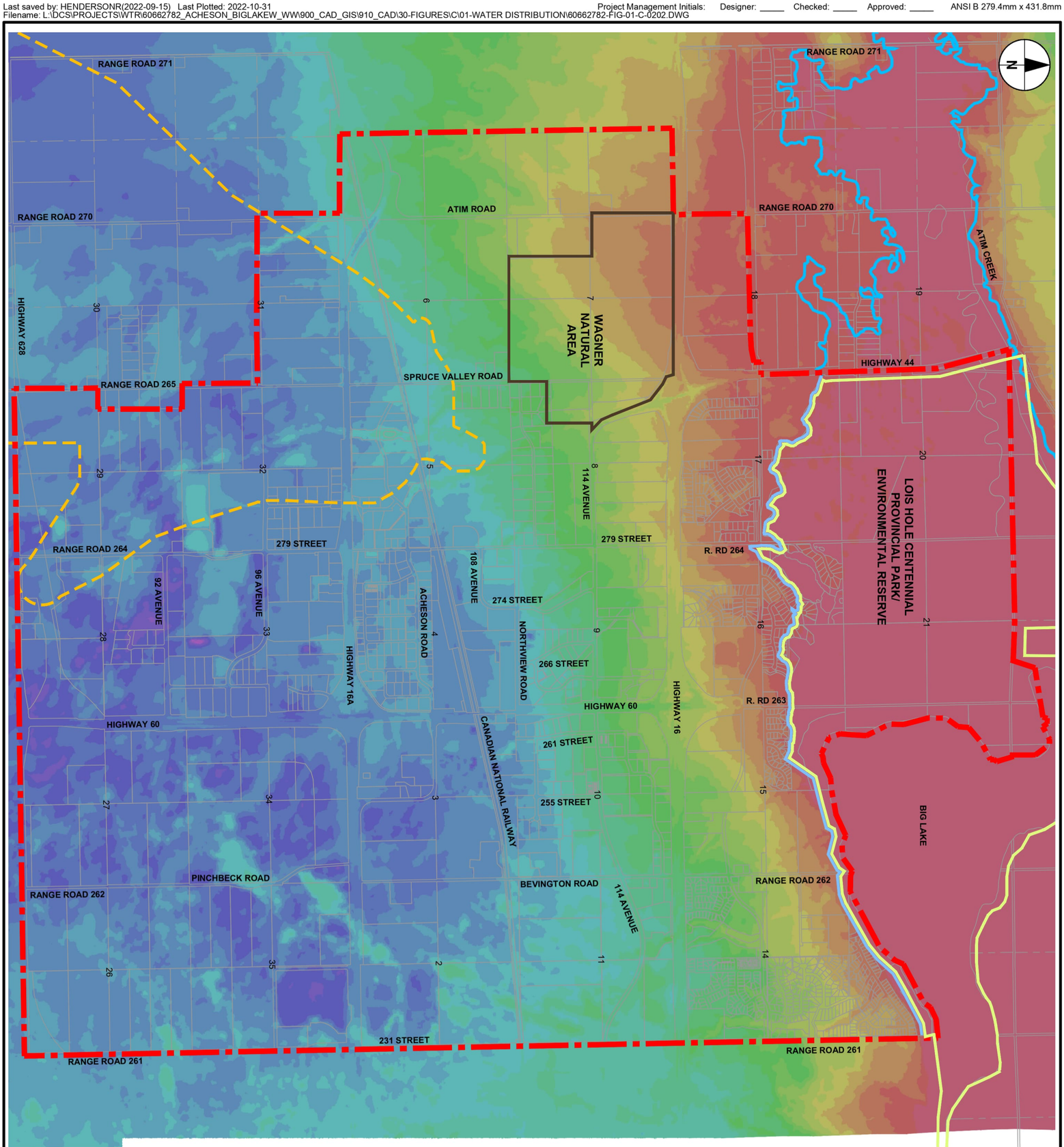


650 660 670 680 690 700 710 720 730 740

ELEVATION (m)

LEGEND

- STUDY AREA
- BIG LAKE FLOOD DELINEATION (1:100 YEAR FLOOD)
- WAGNER NATURAL AREA
- LOIS HOLE CENTENNIAL PROVINCIAL PARK / ENVIRONMENTAL RESERVE
- WAGNER NATURAL AREA GROUNDWATER RECHARGE ZONE

DATA SOURCE:
2018 LIDAR PROVIDED BY PARKLAND COUNTY.

1:40000

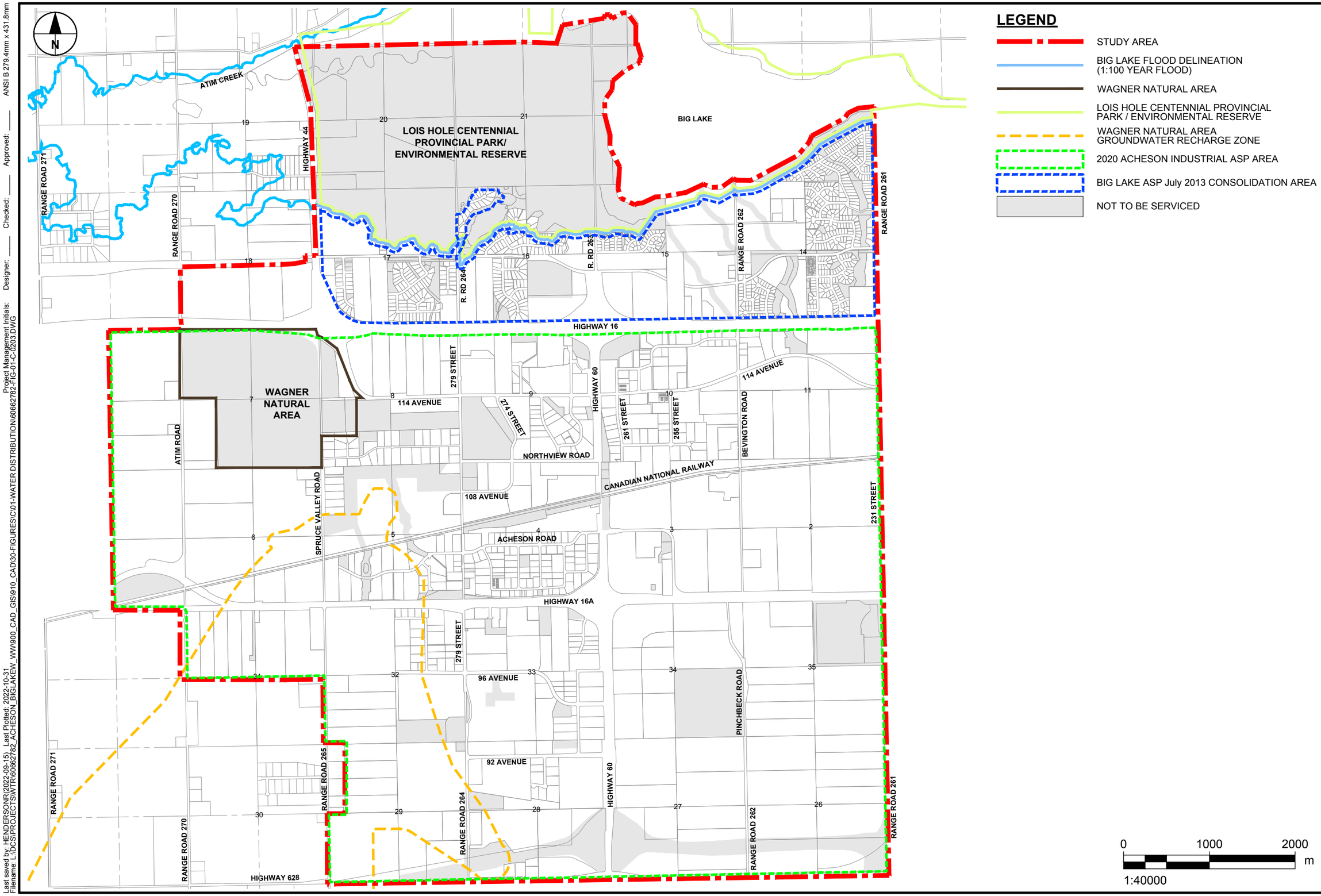
0 1000 2000 m

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

EXISTING TOPOGRAPHY

AECOM

Figure: 2.2



LEGEND

- STUDY AREA
- BIG LAKE FLOOD DELINEATION (1:100 YEAR FLOOD)
- WAGNER NATURAL AREA
- LOIS HOLE CENTENNIAL PROVINCIAL PARK / ENVIRONMENTAL RESERVE
- WAGNER NATURAL AREA GROUNDWATER RECHARGE ZONE
- 2020 ACHESON INDUSTRIAL ASP AREA
- BIG LAKE ASP July 2013 CONSOLIDATION AREA
- NOT TO BE SERVICED

0 1000 2000 m

1:40000

AECOM

Figure: 2.3

LAND USE

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm

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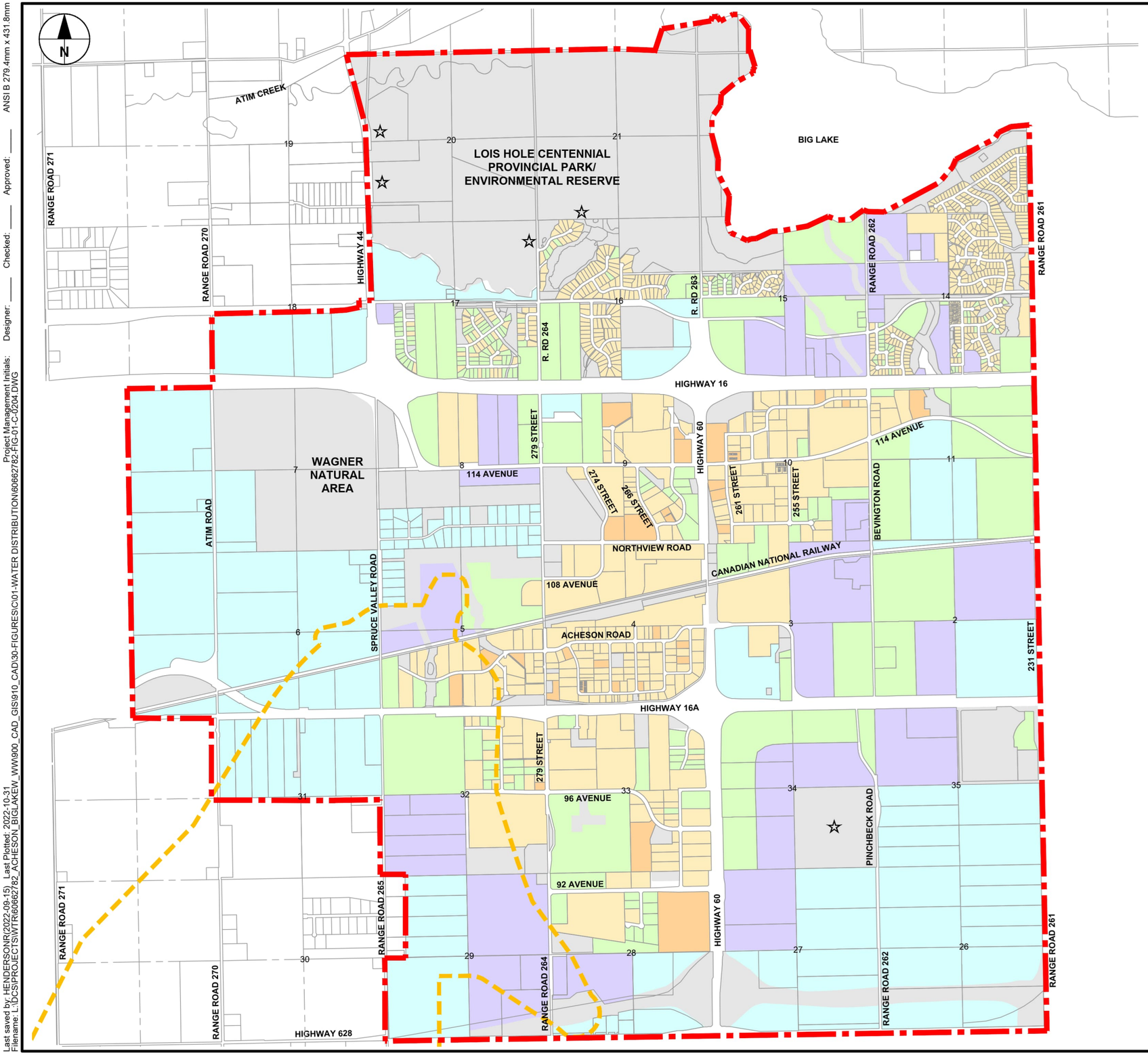


LEGEND

- STUDY AREA
- WAGNER NATURAL AREA GROUNDWATER RECHARGE ZONE

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NEAR FUTURE DEVELOPMENT
- LONG TERM DEVELOPMENT
- ULTIMATE DEVELOPMENT
- NOT TO BE SERVICED
- ☆ FUTURE SINGLE SERVICE (GOLF COURSE / REC FACILITY)

0 1000 2000 m

1:40000

AECOM

Figure: 2.4

DEVELOPMENT STAGING

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

3. Existing System Assessment

3.1 System Description

The ABLA water supply and distribution system consists of two reservoir-pumphouses (referred to as the Zone 3 and Zone 4 reservoirs) and a network of water distribution mains ranging from 150 mm diameter to 600 mm in diameter. The County owns and operates one commercial truck fill station one and smaller barrel fill station that are both located at the Zone 3 reservoir. The system is supplied by the Capital Region Parkland Water Services Commission (CRPWSC). The existing ABLA water distribution system is shown on Figure 3.1.

3.1.1 Supply System

The CRPWSC is supplied by EPCOR Water Services (EPCOR), in coordination with the Regional Water Customers Group (RWCG), which serves communities around Edmonton. The CRPWSC supplies water to Parkland County, Spruce Grove, Stony Plain, and the West Inter Lake District (WILD) Water Commission. The CRPWSC transmission system was recently upgraded near Acheson and consists of three parallel mains along Highway 16A; a 600 mm diameter steel main, a 300 mm diameter steel main, and a 750 mm diameter steel main installed between Edmonton and the Acheson Zone 3 reservoir in 2018. As part of the draft 2022 Water Supply Bylaw, the CRPWSC has committed to provide water to municipalities at a rate of 1.8 times the average day demand for future development.

The Zone 3 and Zone 4 reservoirs are supplied directly from the CRPWSC transmission mains. The Zone 3 reservoir is serviced by three fill lines; with two fill lines (150 mm and 300 mm) connecting through the old pumphouse to the circular reservoir, and one emergency supply line (100 mm) connecting the rectangular reservoir to the CRPWSC line. The Zone 3 Pumphouse is on top of the rectangular reservoir and draws directly from the rectangular reservoir or can draw directly from the circular reservoir depending on operations. Additional details on the Zone 3 reservoir are provided in Section 3.1.2. The supply piping to the Zone 3 reservoir is detailed on Figure 3.1.

The Zone 4 reservoir is serviced by two fill lines: a 200 mm diameter high density polyethylene (HDPE) fill line (ID of 175 mm), and a 250 mm diameter HDPE line (ID of 220 mm). As part of the 600 mm transmission line installation between Acheson Zone 3 and the City of Spruce Grove contract that is being constructed in 2022, a 550 mm booster station back feed is being constructed between the future booster station and tied into the Zone 4 feed lines at 255 Street.

The stop and fill water level points in the reservoirs are set by Parkland County and communicated to the CRPWSC, who supply flow to the ABLA reservoirs when water levels decrease, rather than at a constant supply rate. EPCOR will supply the RWCG at a maximum rate of 1.8 times the average day demand for the region. Peaks in excess of this amount are subject to surcharge fines. As a customer of the RWCG, the CRPWSC may adjust supply rates during high demand periods to help maintain regional peaks but have indicated that they are capable of maintaining adequate levels in the reservoirs in normal demand conditions.

The draft 2022 water supply agreement between the CRPWSC and Parkland County states that: "*The Commission requires Members and Customers provide a minimum water storage of 2 times average day demand, plus fire protection (if provided).*"

3.1.2 Existing System Reservoirs

There are two reservoirs which currently service the ABLA water distribution system. One reservoir is located in Zone 3, and one is located in Zone 4. The total storage capacity of the reservoirs is 13,195 m^3 (4,334 m^3 at Zone 3 and 8,860 m^3 at Zone 4).

The Zone 3 reservoir is located west of Highway 60 south of Ellis Drive. The reservoir consists of a round tank with an area of 499 m^2, and a rectangular tank with an area of 618 m^2. The accessible storage depth of the Zone 3 reservoir is 3.88 m, resulting in a combined total volume of 4,334 m^3.

The Zone 4 reservoir is located east of Highway 60 and south of Acheson Road. The reservoir was expanded in 2020 and the expanded (east) cell was commissioned in late 2020. The east cell at the Zone 4 reservoir was designed based on the same elevations as the existing (west) cell so they could operate together. The accessible storage depth is 4.43 m, resulting in a storage volume of 3,611 m^3 within the west cell, and 5,249 m^3 in the east cell, for a combined storage volume of 8,860 m^3.

In general, the reservoirs are not operated at a depth less than 1 m from the bottom of the tank. However, this was not considered as part of the calculations.

3.1.3 Existing System Pumping

Currently, the ABLA water distribution system is serviced by pumphouses located at the Zone 3 and Zone 4 reservoirs.

At the Zone 3 pumphouse, there are five pumps. There are two electric constant speed pumps, P-101 and P-102, which are capable of providing 28 L/s each. There is one variable speed pump, P-103, which has a design capacity of 56 L/s. The two remaining pumps, P-104 and P-105, are capable of providing 128 L/s each. P-104 is a constant speed pump and is meant to operate during high demand scenarios, and P-105 is a standby constant speed pump. The total available capacity of the existing Zone 3 pumphouse is 240 L/s, plus 128 L/s including the standby pump. The Zone 3 pumphouse has a generator that supplies power to P-105 during emergency scenarios. Pumps P-101, P-102 and P-103 are connected to a 250 mm diameter steel header. The 250 mm diameter header connects to the distribution flow meter, and then to a 400 mm diameter steel header, to which pumps P-104 and P-105 are connected. Based on a maximum velocity of 3 m/s, the capacities of the 250 mm and 400 mm diameter headers are 155 L/s and 400 L/s respectively, which are adequate to convey the flows from all pumps running simultaneously.

At the Zone 4 pumphouse, there are two identical variable speed pumps each capable of providing 105 L/s. One pump is generally utilized for distribution with one pump as a standby unit. However, each pump is operated periodically to prevent seizing. The Zone 4 pumphouse has a generator that has the capacity to power both pumps at the same time. The header in Zone 4 is 300 mm diameter steel pipe; based on a maximum velocity of 3 m/s, the capacity of the header is 225 L/s. However, the SCADA system currently prohibits both pumps at Zone 4 from operating at the same time. Therefore, for the purposes of the assessment, the capacity of the Zone 4 pumphouse is considered to be 105 L/s.

The operation philosophy is discussed in detail in Section 3.1.4; however, in general the Zone 4 pumphouse is operated during the day and the Zone 3 pumphouse is operated at night during lower flow conditions. This operation is maintained such that the water is cycled through each reservoir to preserve water quality in each reservoir, as well as accommodate the highly variable system demand ABLA experiences throughout the day. The total combined pump capacity is the pumphouses is 345 L/s, with backup standby capacity at the Zone 3 and Zone 4 reservoirs of 128 L/s and 105 L/s, respectively. Table 3.1 summarizes the existing pump capacities at the Zone 3 and Zone 4 pumphouses.

Table 3.1: Existing Pump Capacities

Location	Pump	Capacity (L/s)	Description
Zone 3 Reservoir	P-101	28	Constant speed
	P-102	28	Constant speed
	P-103	56	Lead pump, variable speed
	P-104	128	Constant speed
	P-105	128	Standby for power outage, generator started, constant speed
Zone 4 Reservoir	P-1	105	Alternating lead and standby pump, variable speed
	P-2	105	Alternating lead and standby pump, variable speed

3.1.4 Existing Operation Philosophy

During normal operation during the day (from 8 am to 10 pm) (as witnessed during hydrant flow testing on September 21, 2021 and July 22, 2022), the operation philosophy at the reservoir-pumphouses acts as follows. It is understood that the system set pressures are altered occasionally by Operations to optimize reservoir levels and pump activations, but in general remain close to the values listed below:

- Zone 4 acts as the lead pumphouse with one pump in operation (105 L/s). One pump at Zone 4 will always be in operation, and the active pump at the Zone 4 pumphouse is alternated each day to help prevent seizing. The SCADA system only allows one pump at Zone 4 to be in operation at a time.
- When P-1 or P-2 reaches 1,750 rpm (slightly below the maximum of 1770 rpm), P-103 will start at the Zone 3 reservoir.
- As the pressure at the header at Zone 3 decreases, P-102 and then P-101 will start.
  - As the pressure decreases to 64 psi for 5 seconds, P-102 at Zone 3 will start
  - As the pressure decreases to 62 psi for 8 second, P-101 at Zone 3 will start
- With further increase in demand where the pump header pressure at Zone 3 drops to 379 kPa (55 psi), P-104 will start. This pressure set point is operator adjustable.
- As demand decreases, and pressure at the Zone 3 header increases, the pumps will turn off in the following order: P-104, P-102, P-101, then P-103. All set-points are operator adjustable.
  - P-104 will turn off when the pressure increases to 483 kPa (70 psi) for 60 seconds.
  - When the pressure increases to 67 psi for 1 minute, P-101 will turn off.
  - When the pressure increases to 68 psi for 1 minute, P-102 will turn off.
  - P-103 is not operator adjustable based on the site visit, however it was previously understood that P-103 would turn off when the flow drops to 40 L/s for 60 seconds.
  - The operating pump at Zone 4 will remain in operation.

Generally, at night (from 10pm to 8 am), the Zone 3 pumps will become the lead and operate to maintain system pressure, with operation philosophy as follows:

- P-103 will operate as the lead pump.
- As P-103 ramps up to 1767 RPM for 6 seconds or the pressure drops to 434 kPa (63 psi), P-102 will start
- As P-103 ramps up to 1776 RPM for 10 seconds or the pressure drops to 427 kPa (62 psi), P-101 will start
- Once system pressure at the header drops to 379 kPa (55 psi) for 1 second, P-104 will start.
- If all four pumps at Zone 3 are running and the pressure at Zone 4 drops to 379 kPa (55 psi), one pump at Zone 4 will start.
- If communication between the Zone 3 and 4 reservoirs fails, then a pump at Zone 4 will start, as well as if the Zone 4 reservoir detects that a pump is not running at Zone 3, a pump at Zone 4 will start.

- P-105 is operated at least 4 hours per month to prevent seizing. P-105 is operated with the power generator only.
- As demand decreases, and the pressure at the Zone 3 header increases, the pumps will turn off in the following order: Zone 4, P-104, P-102, P-101:
  - When the pressure rises above 345 kPa (50 psi) for 30 seconds (operator adjustable), the Zone 4 pump will turn off
  - P-104 will turn off when the pressure is above 379 kPa (55 psi) for 30 seconds.
  - P-102 will turn off when the flow leaving Zone 3 drops to 50 L/s for 20 seconds.
  - P-101 will turn off when the flow leaving Zone 3 drops to 30 L/s for 60 seconds.
  - P-103 will remain running.

3.1.5 Distribution System

Recent System Upgrades

The following upgrades to the water distribution system have been completed since the 2016 Study:

- Zone 4 Reservoir Expansion
- Walker Lake to Lakeshore water line including PRV-19 (commissioned in March 2022) (nodes J-81 to J-165)
- 200 mm Pipe south of 114 Avenue along 266 Street for Fath Phase 2 in Zone 1 (nodes J-200 to J-515)
- 400 mm Pipe running south along 279 Street to 92 Avenue (nodes J-508 to J-634)
- 400 mm Pipe along 92 Avenue and across Highway 60 in Zone 7 (nodes J-634 to J-719)
- 300 mm Pipe Loop in Zone 7 for the Highlands Horseshoe Development (loop from nodes J-647 to J-650)
- 600 mm Pipe running south from the Acheson Zone 3 reservoir across Highway 16A and through a portion of Zone 5 to the distribution system (nodes J-244 to J-390)
- 200 mm Service Line Pipe running along Range Road 261 (nodes J-111 to J-721)
- Two 200 mm Service Line Pipes east of Range Road 263 (nodes J-83 to J-662, and J-85 to J-663)

Distribution Pipes

The existing ABLA water distribution system consists of a looped network, with pipe sizes ranging from 150 mm to 400 mm inside diameter, with one 600 mm line from Zone 3 to Zone 5 across Highway 16A. The water distribution system primarily consists of polyvinyl chloride (PVC), with asbestos cement (AC) pipes in the older areas (Ellis and Sherwin Industrial Park in Zone 3). High density polyethylene (HDPE) pipes were used primarily for highway and railroad crossings or any directionally drilled mains. The existing network schematic detailing pipe locations and diameters is illustrated on Figure 3.1. Figure 3.2 shows the pipe material within the ABLA water distribution system.

Pressure Zones and Pressure Reducing Valves

There are five pressure zones within the existing water distribution system, separated by pressure reducing valves (PRVs) to reduce the pressure within the distribution system as the ground elevation lowers towards Big Lake. Areas south of the CN Railway are supplied directly by the reservoirs. PRV-A and PRV-B are located north of the CN Railway, adjacent to 279 Street and Highway 60, respectively, that control the pressure to areas to the north. PRV-A is a single 300 mm diameter pressure reducing valve. It should be noted that PRV-A is the only single valve PRV in the water distribution system. PRV-B is fitted with a 100 mm and a 300 mm pressure reducing valve.

The pressure is further reduced to the residential areas north of Highway 16 by a series of double valve PRVs. The first are PRV-1 and PRV-2, which are just north of Highway 16. The Walker Lake to Lakeshore water line (commissioned March 2022) introduced an additional PRV (PRV-19) located just north of PRV-2 to keep the pressure zones separate. North of PRV-2, the pressure is reduced again by PRV-3 and PRV-21 to the Helenslea and Lakeshore Estates neighbourhoods.

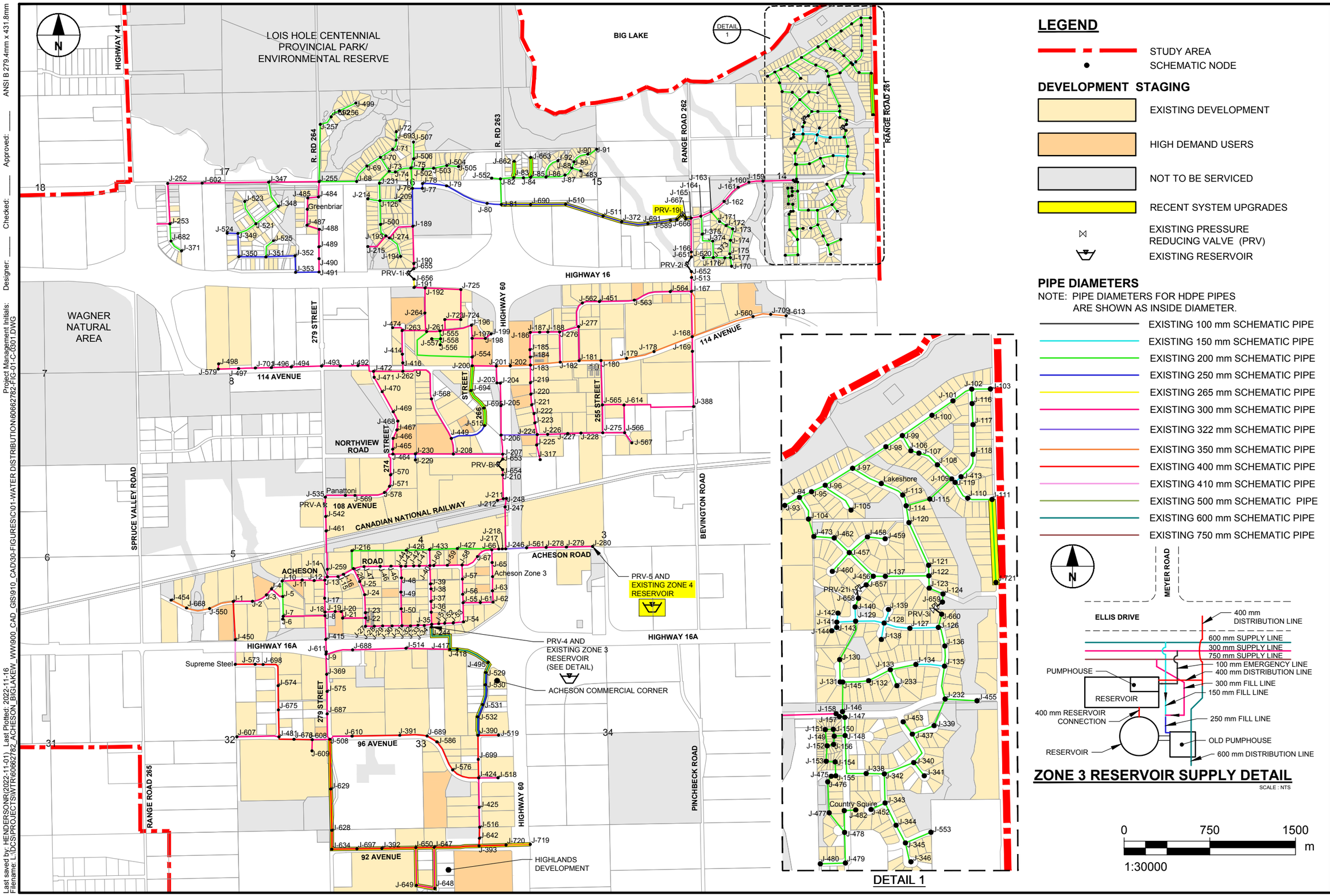
The locations of the PRVs are shown on Figure 3.3. Table 3.2 below summarizes the pressure setting of the existing PRVs as provided in September 2021 by the operations team. All PRVs with the exception of PRV-A are dual PRVs and have both high flow and low flow valves with slightly different settings, as shown in Table 3.2.

Table 3.2: Existing System Pressure Settings

PRV Name	Location Description	Zones	Elevation	Outgoing Pressure Setting		HGL Elevation
-	-	-	(m)	(kPa)	(psi)	(m)
-	Zone 3 Reservoir*	3-8	716.05	490	71-73	766
-	Zone 4 Reservoir*	3-8	714	496	70-72	764.6
PRV-A	Navistar	1-2	703	400	58	743.8
PRV-B	Highway 60	1-2	706	386	56	745.4
				386	56	745.4
PRV-1	Royal Springs	Big Lake West	670	450	65	716.2
				430	62	714.3
PRV-2	Countryside Ravines	Big Lake East	689	441	64	734
				414	60	731.2
PRV-3	Helenslea East	Big Lake East	676.7	393	57	716.8
				379	55	715.3
PRV-19	Walker Lake	Big Lake West	685	330	48	716.2
				311	45	714.3
PRV-21	Helenslea West	Big Lake Northeast	670.5	455	66	716.9
				434	63	714.8

**There are no PRVs at the Zone 3 and Zone 4 pumphouses. The pressure settings provided are maintained by the pumphouses by monitoring of the flow/pressure at the outgoing header at each reservoir.*

With the commissioning of the Walker Lake to Lakeshore water line, the pressure setting of PRV-1 was increased to 65 psi (716 m HGL) from 55 psi (709 m HGL) so that it is operated in conjunction with the new PRV-19 on the east end of the new watermain allowing flow through both PRVs during normal operating conditions. This work was completed in March 2022.



LEGEND

- STUDY AREA
- SCHEMATIC NODE

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NOT TO BE SERVICED
- RECENT SYSTEM UPGRADES
- EXISTING PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR

PIPE DIAMETERS

NOTE: PIPE DIAMETERS FOR HDPE PIPES ARE SHOWN AS INSIDE DIAMETER.

- EXISTING 100 mm SCHEMATIC PIPE
- EXISTING 150 mm SCHEMATIC PIPE
- EXISTING 200 mm SCHEMATIC PIPE
- EXISTING 250 mm SCHEMATIC PIPE
- EXISTING 265 mm SCHEMATIC PIPE
- EXISTING 300 mm SCHEMATIC PIPE
- EXISTING 322 mm SCHEMATIC PIPE
- EXISTING 350 mm SCHEMATIC PIPE
- EXISTING 400 mm SCHEMATIC PIPE
- EXISTING 410 mm SCHEMATIC PIPE
- EXISTING 500 mm SCHEMATIC PIPE
- EXISTING 600 mm SCHEMATIC PIPE
- EXISTING 750 mm SCHEMATIC PIPE

ZONE 3 RESERVOIR SUPPLY DETAIL

SCALE : NTS

0 750 1500 m

1:30000

EXISTING WATER DISTRIBUTION SYSTEM

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

AECOM
Figure: 3.1

Project Management Initials: Designer: Checked: Approved: ANSI B 279.4mm x 431.8mm
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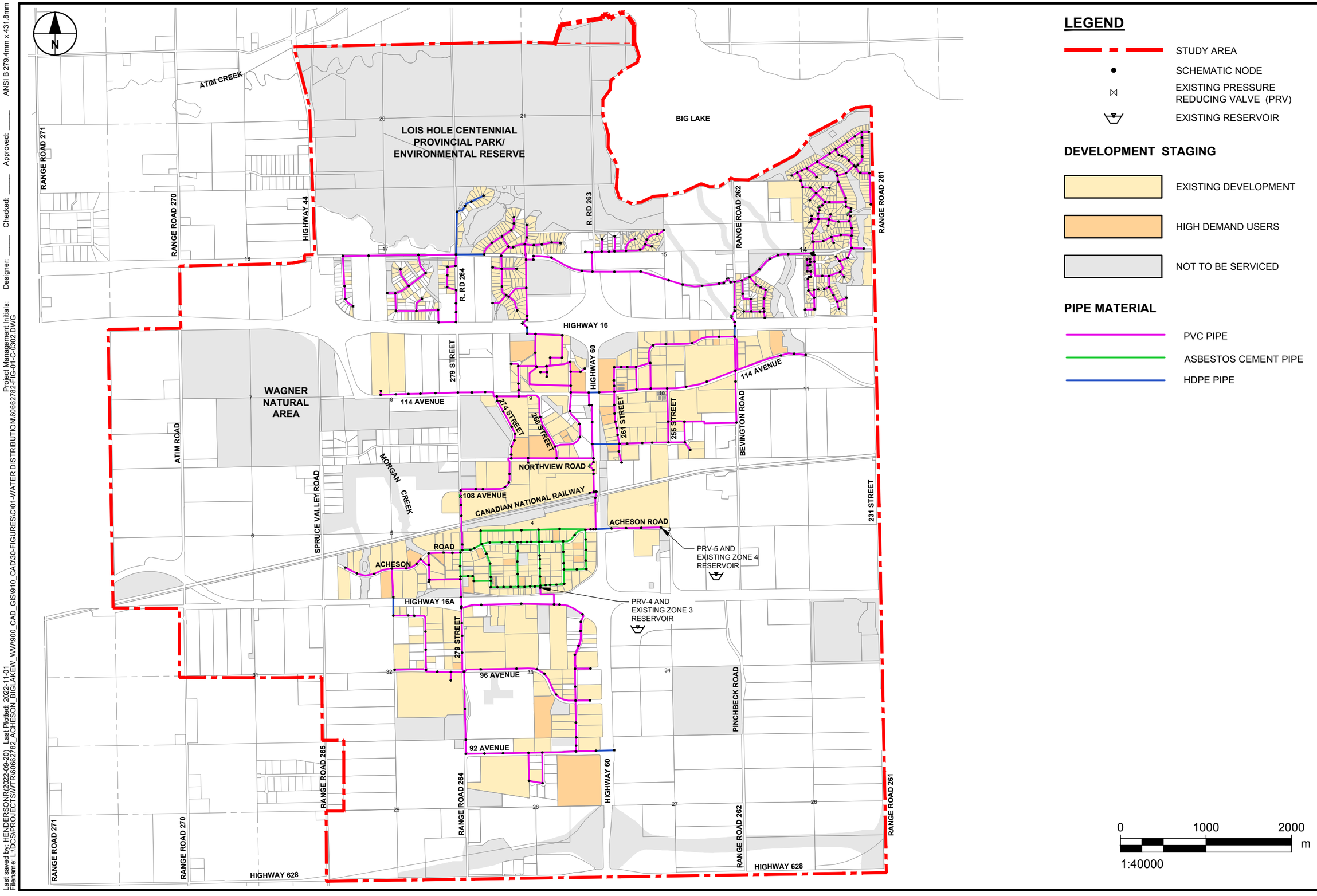

LEGEND

- STUDY AREA
- SCHEMATIC NODE
- EXISTING PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NOT TO BE SERVICED

PIPE MATERIAL

- PVC PIPE
- ASBESTOS CEMENT PIPE
- HDPE PIPE

0 1000 2000 m

1:40000

AECOM

Figure: 3.2

EXISTING WATER DISTRIBUTION SYSTEM PIPE MATERIALS

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

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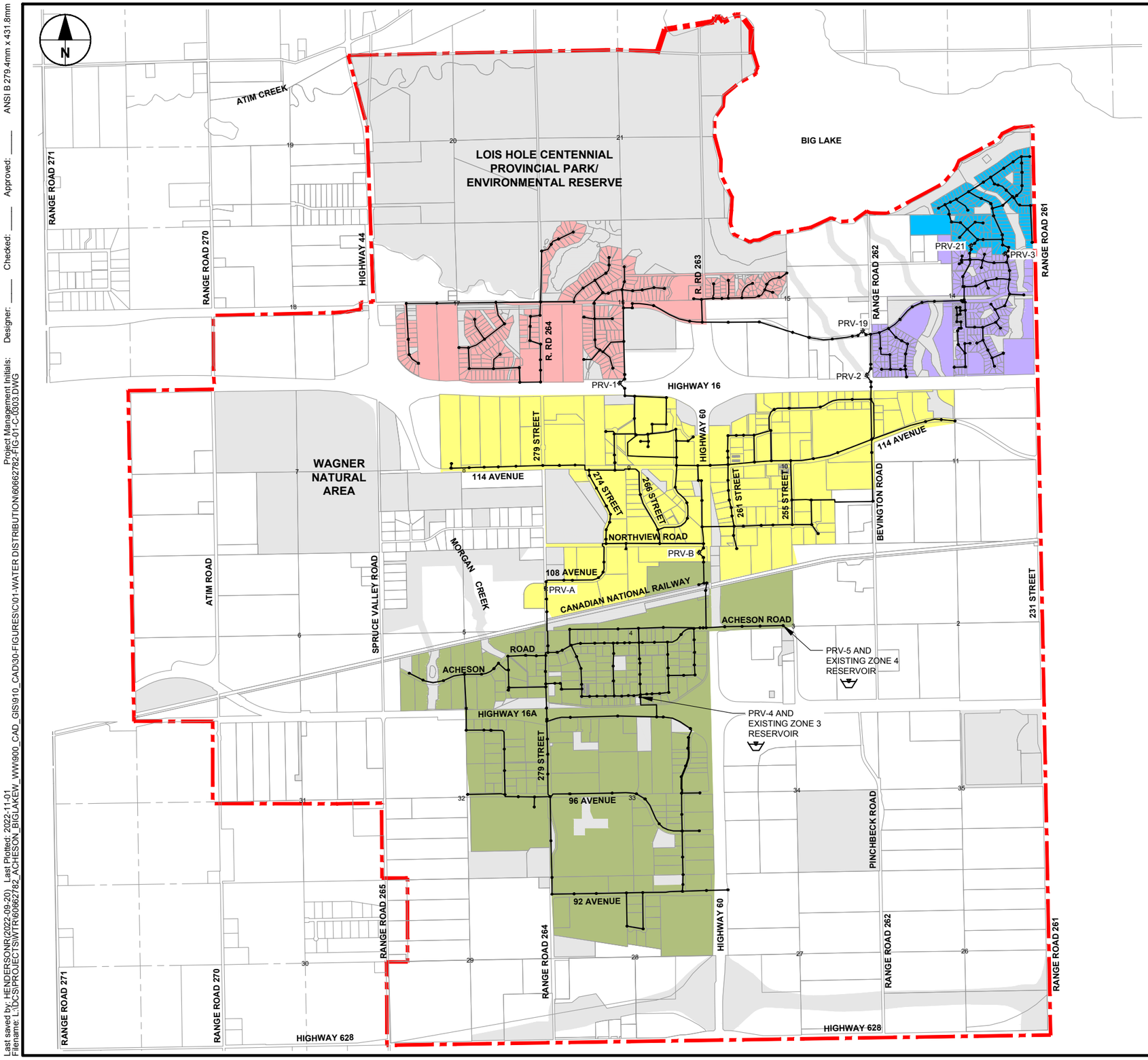

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Figure: 3.3

EXISTING WATER DISTRIBUTION SYSTEM
PRESSURE ZONES AND PRVS

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm

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3.2 Water Consumption Data

Water consumption data was provided by the County via four sources including the following:

- Monthly purchasing data from the CRPWSC from 2016 to 2021 which is supplemented with data compiled since 2010.
- Detailed SCADA reservoir flow and level data from the Zone 3 and Zone 4 pumphouses, including 10 second interval data from June-October 2021.
- Purchasing data from customers within ABLA for 2016-2022. The purchasing data was geospatially linked to parcel data within ABLA.
- Daily pumphouse logs from operations

Table 3.3 summarizes the purchasing data from the CRPWSC. The data was provided as monthly totals and is summarized as yearly totals to determine how the demand within ABLA has grown over recent years.

Table 3.3: CRPWSC Purchasing Data

Year	Zone 3 Volume	Zone 4 Volume	Total	Yearly Percent Growth
-	(m^3)	(m^3)	(m^3)	(%)
2010	279,578	173,862	453,440	-
2011	244,541	209,292	453,833	0%
2012	243,969	191,560	435,529	-4%
2013	219,483	236,732	456,215	5%
2014	313,412	196,984	510,396	12%
2015*	332,916	252,929	585,845	15%
2016	296,923	249,756	546,679	-7%
2017	313,687	238,010	551,697	1%
2018*	313,713	277,727	591,440	7%
2019	254,135	285,294	539,429	-9%
2020	335,772	323,005	658,777	22%
2021	390,463	372,000	762,463	16%

**Note: The 2015 and 2018 values used daily log sheets due to CRPWSC meter not being correct.*

As seen in Table 3.3, the demand growth fluctuates year to year, with some years decreasing by up to 9%. In general; however, the consumption is increasing at a variable rate, with some years having significant jumps of up to 22%. This variability in demand growth is consistent with the high-demand industrial users that are serviced within the Acheson Industrial Area that are added to the system every few years. The average yearly consumption growth since 2010 is 5%.

Table 3.4 summarizes the data from the daily pumphouse log sheets provided by Parkland County from 2018-2022. The data was utilized to determine the average annual amount of water that was utilized by system, which was then utilized to calculate the average daily demand (ADD). The Zone 3 reservoir has three outflows (distribution, truck fill, and barrel fill) and the water is tracked separately to determine the demands of each. At the Zone 3 pumphouse, P-104 and P-105 are downstream of the mag meter; therefore, the metered values do not include flow supplied by P-104 or P-105.

Table 3.4: Pumphouse Log Sheet Summary

Average Day Demand (ADD)	Year				
	2018	2019	2020	2021	2022*
Zone 3 Distribution (L/s)	7.3	7.2	9.7	11.2	11.5
Zone 4 Distribution (L/s)	8.7	9.0	9.9	11.5	10.0
Subtotal Distribution (L/s)	**15.9**	**16.2**	**19.5**	**22.7**	**21.5**
Truck Fill (L/s)	2.3	0.7	0.8	1.1	1.1
Barrel Fill (L/s)	0.4	0.3	0.4	0.5	0.5
Total (L/s)	**18.6**	**17.3**	**20.7**	**24.3**	**23.0**

** Note: Data from January-July 2022*

To determine the maximum day demand (MDD) peaking factor (PF) and peak hour demand (PHD) peaking factor, the 5 day rolling average, and 1 hour rolling average were used, respectively for each reservoir. This practice was used during the previous Studies to eliminate outlier data and is consistent with other municipalities. SCADA data was utilized to determine peaking factors for the water distribution system. SCADA provides 10 second interval data such as demand flows, pressures, chlorine levels, and pump RPM and run times. Zone 3 SCADA data was provided from June to October 2021, while Zone 4 data spanned from July to October 2021. Table 3.5 summarizes the analysis, in which the MDD and PHD for each reservoir are shown separately to show how the flow rate in each reservoir peaks individually. The total demand row shows the total demand for the ABLA water distribution system during MDD flow and PHD flow at each reservoir simultaneously, which would be less than the sum of the peak flow for each individual reservoir.

Table 3.5: Existing Water Consumption and Peaking Factor Summary

Zone	Average Flows*	MDD (5 day Rolling Avg)	MDD PF (5 day Rolling Avg)	PHD (1 hour Rolling Avg)	PHD PF (1 hour Rolling Avg)
-	(L/s)	(L/s)	(-)	(L/s)	(-)
Zone 3	14.2	36.6	2.6	77.9	5.5
Zone 4	15.1	22.0	1.5	63.2	4.2
Total Demand	**22.6**	**37.3**	**1.65**	**84.2**	**3.72**

** Note: Average flows do not represent ADD. Data from June to October 2021 for Zone 3, and July to October 2022 for Zone 4*

As seen in Table 3.5, the peaking factors determined for the Existing system were calculated to be 1.65 and 3.72 for MDD and PHD, respectively. These values are similar to the previous Studies as well as other similar municipalities. As discussed in Section 3.4.2.3, the development standards recommend peaking factors of 2 and 3 for MDD and PHD, respectively. For the purposes of Existing system analysis, the calculated values for the Existing system will be used. For future development and redeveloped areas, the development standards are used.

Parkland County provided billing parcel data from 2016 to 2022. The data was utilized to spatially represent the demand within the model. The average day demand from the parcel data was also determined and compared to the CRPWSC purchasing and pumphouse daily log sheets (not including truck and barrel fill flows), which is summarized in Table 3.6.

Table 3.6: Existing Water Consumption Summary

Year	ADD from CRPWSC Purchasing	ADD from Pumphouse Daily Log Sheets (No Truck + Barrel Fill)	ADD from Billing Data	Percent in Unaccounted Water Demand
	(L/s)	(L/s)	(L/s)	%
2016	17.3	-	10.6	-
2017	17.5	-	13.8	-
2018	18.8	15.9	10.6	34%
2019	17.1	16.2	11.0	32%
2020	20.8	19.5	14.1	28%
2021	24.2	22.7	15.2	33%
2022*	-	21.5	11.5	47%

**Note: Data from January-July 2022*

As seen in Table 3.6, when compared to the pumphouse daily log data (less barrel and truck fill flows), there is an average of 35% in unaccounted for water demand throughout the distribution system from 2018 to 2021. Losses in a water distribution system are common as they occur through hydrant testing and during flushing programs, leaks throughout the system, and through unmetered use for construction. While losses of around 10% in a water distribution system are common, this loss value is quite high and further investigation should be taken in to determine the cause. The discrepancy between the CRPWSC data and the pumphouse data would also be impacted by P-104 operation as this pump is downstream of the flow meter in the Zone 3 pumphouse. During high demand conditions that cause this pump to turn on, the flow is not accounted for in the pumphouse data.

The 2020 distribution ADD of 19.5 L/s was utilized in the Existing system model. The ADD from billing data of 14.1 L/s was allocated to nodes by parcel, and the additional 5.4 L/s was allocated throughout the system to represent the unmetered usage and volumes. This would represent point loads from users opening hydrants and other water losses in the system.

The model demands were not updated to include the increase in demand seen in 2021 since the initial development of the model as part of this Study with the 2020 data. The increase in demand for 2021 was an ADD increase of 3.2 L/s (22.7 L/s less 19.5 L/s). This 3.2 L/s increase in ADD would have minimal impact to the model results, as the governing demand condition for the ABLA is the required fire flow rate of the system at 230 L/s.

3.3 Model Development

The water distribution system for the ABLA was modelled using WaterCAD CONNECT Edition Update 3, developed by Bentley Systems Ltd. This program has the capacity to model both steady state and extended period simulations. The software uses pull-down menus for data entering and editing along with the AutoCAD based graphical interface. The software allows for review of the simulation graphically on screen which can be plotted.

The following sections summarize the model calibration, design criteria, and system demand summary utilized for the development of the hydraulic model. The model represents the water distribution system through a series of pipes and junction nodes. The program requires physical details of the water distribution system, such as pipe diameters, lengths, roughness coefficients, water consumption demands, and ground elevations to develop the model. The model was initially developed as part of the Acheson and Big Lake Water Servicing Study, UMA 2007, and updated as part of the 2011 and 2016 Studies. The model physical attributes were compared with the County's current inventory of water assets in GIS which included any infrastructure constructed and in service since 2016.

Water consumption via parcel purchasing data provided by the County was utilized to spatially represent the demand within the distribution system. Water consumption boundaries were developed in ArcGIS and the demand for each parcel within each catchment area was applied to the nearest node. As discussed in Section 3.2, to account for water losses not captured within the billing data, the remaining demand was allocated throughout the system. This differs from previous studies, in which only high demand users were given individualized demand rates, and the remaining flow was spread out throughout the model.

3.3.1 Model Calibration

Hydrant testing was conducted on September 21, 2021 and July 22, 2022 by SFE Global, with the County and AECOM in attendance. The locations of the hydrant testing are shown on Figure 3.4. Hydrant test locations completed as part of the previous Studies are also shown on Figure 3.4. Testing was conducted on 12 hydrants throughout the water distribution system with two additional pressure sensors to monitor the pressure drop during the hydrant testing at other locations throughout the system. The field recorded results were extrapolated to estimate the available flow at 140 kPa. The results of the hydrant testing are shown in Table 3.7.

Table 3.7: Hydrant Testing Results

Test Number	Flow Hydrant	Residual Hydrant	Static Pressure	Flow Hydrant Pressure	Flow Hydrant Flow	Residual Hydrant Residual Pressure	System Hydrant 1 Residual Pressure	System Hydrant 2 Residual Pressure	Flow at 140 kPa (20 psi)
(-)	(-)	(-)	(kPa)	(kPa)	(L/s)	(psi)	(psi)	(psi)	(L/s)
1	FH03-023	FH03-024	517	145	109	54	-	-	183
2	FH05-022	FH05-021	469	124	101	58	64	72	235
3	FH05-057	FH05-056	545	159	114	67	62	74	269
4	FH07-014	FH07-013	414	131	103	54	63	72	288
5	FH01-032	FH01-031	545	145	109	66	63	72	246
6	FH01-027	FH01-028	345	110	95	45	68	70	250
7	FH02-016	FH02-017	427	131	103	56	67	68	296
8	FH02-090	FH02-089	448	131	103	56	68	68	247
9	FH0C-002	FH0C-001	607	110	95	66	45	65	175
10	FH0A-047	FH0A-048	414	152	50	49	64	68	100
11	FH07-008 & FH07-006	FH07-007	496	110	140	58	58	72	285
12	FH0D-005	FH0D-004	634	131	46	50	65	68	62

The model was calibrated by varying the Hazen Williams ‘C’ values, which represent the roughness of the pipes within the water distribution system, so that the model best matches the hydrant testing results. Since the model was previously calibrated during the 2016 Study, the ‘C’ values utilized in the 2016 Study were assessed first, and then were adjusted to better match the hydrant test results.

The C values utilized in the 2016 Study are as follows:

- PVC, HDPE, and Steel pipes: C = 120
- Asbestos Cement: C = 110

Utilizing the 'C' values from the 2016 Study, the model calibration was assessed in two steps. First, scenarios within the model were set up to mimic the conditions of each test. The demand of the ABLA the day of the testing (approximately 32 L/s) was input into the model and the flow rate of the hydrant recorded during each test was placed at a node nearest the testing location. The resulting residual pressure was compared at the residual hydrant as well as the pressure at the system loggers was compared to the nearest model node.

The second step of calibration assessment utilized the automated fire flow simulation within the model to determine the available fire flow at each tested node. This allows for a comparison to the extrapolated calculation provided by SFE if the system were drawn down to 140 kPa (20 psi) at the flowing hydrant node. Tables 3.8 and 3.9 show the model calibration results using the coefficients from the 2016 Study.

It should be noted that the extrapolated value for the available fire flow at 140 kPa should be used with caution. The calculation uses a mathematical extrapolation of the field tested data and does not consider whether additional pumps could be activated. Therefore, the available fire flow at 140 kPa provided by SFE should not be considered as the maximum flow rate that could be provided by the water distribution system at each location.

Table 3.8: 2022 Model using 2016 Study Calibration Coefficients - Pressure Comparison

Test Number	Flow Hydrant			System Hydrant 1			System Hydrant 2		
	Tested Pressure (kPa)	Modelled Pressure (kPa)	Percent Difference (%)	Tested Pressure (kPa)	Modelled Pressure (kPa)	Percent Difference (%)	Tested Pressure (kPa)	Modelled Pressure (kPa)	Percent Difference (%)
1	372	348	-6.7%	-	-	-	-		
2	400	479	19.8%	441	445	0.8%	496	520	4.7%
3	462	471	1.9%	427	435	1.8%	510	520	1.9%
4	372	381	2.2%	434	441	1.4%	496	520	4.7%
5	455	471	3.5%	434	440	1.3%	496	520	4.7%
6	310	322	3.8%	469	390	-16.8%	483	499	3.4%
7	386	397	2.9%	462	459	-0.6%	469	482	2.8%
8	386	383	-0.9%	469	459	-2.1%	469	479	2.1%
9	455	486	6.8%	310	450	45.1%	448	503	12.2%
10	338	347	2.7%	441	445	0.8%	469	512	9.1%
11	400	375	-6.2%	400	396	-0.9%	496	520	4.7%
12	345	391	13.4%	448	451	0.6%	469	514	9.7%
Average	-	-	**5.9%**	-	-	**6.5%**	-	-	**5.5%**

Table 3.9: 2022 Model using 2016 Study Calibration Coefficients - Flow at 140 kPa Comparison

Test Number	Flow Hydrant		
	Tested (calculated) Flow at 140 kPa (L/s)	Modelled Flow at 140 kPa (L/s)	Percent Difference (%)
1	183	260	42.2%
2	235	286	21.6%
3	269	297	10.5%
4	288	261	-9.4%
5	246	247	0.4%
6	250	275	10.3%
7	296	263	-11.1%
8	247	235	-4.7%
9	175	226	29.5%
10	100	98	-1.9%
11	285	283	-0.6%
12	62	78	24.9%
Average	-	-	**13.9%**

As seen in Tables 3.8 and 3.9, overall, the model calibration generally shows higher system pressure as well as estimates greater available fire flow throughout the system, which is indicated by the average percent difference being a positive value. However, not all locations are overestimated, with some locations estimating lower pressure than monitored and the available fire flow is underestimated. When evaluating the difference between monitored and modelled results, it was noted that areas with older pipes such as Zones 3 and 4, the available flow is high when compared to the tested value. In areas with newer piping, the model pressures were lower than the tested results. This indicated that in areas with older pipes, a rougher (lower) 'C' value could better represent the field results, and in areas with newer pipes, a higher (smoother) 'C' value could be used.

Therefore, a calibration scenario was tested with the following values:

- PVC, HDPE, and Steel pipes: C = 140
- Asbestos Cement: C = 90

With the updated 'C' values, the calibration assessment was completed similarly to the 2016 values for both steps and the results comparing the monitored to modelled values are shown in Tables 3.10 and 3.11.

Table 3.10: Updated Calibration Coefficients - Pressure Comparison

Test Number	Flow Hydrant			System Hydrant 1			System Hydrant 2		
	Tested Pressure	Modelled Pressure	Percent Difference	Tested Pressure	Modelled Pressure	Percent Difference	Tested Pressure	Modelled Pressure	Percent Difference
	(kPa)	(kPa)	(%)	(kPa)	(kPa)	(%)	(kPa)	(kPa)	(%)
1	372	342	-8.1%	-	-	-	-	-	-
2	400	489	22.2%	441	452	2.3%	496	521	4.9%
3	462	481	4.2%	427	443	3.5%	510	521	2.0%
4	372	390	4.8%	434	448	3.2%	496	521	4.9%
5	455	343	-24.7%	434	447	2.9%	496	521	4.9%
6	310	337	8.7%	469	412	-12.1%	483	514	6.6%
7	386	424	9.8%	462	468	1.3%	469	507	8.2%
8	386	417	8.0%	469	468	-0.1%	469	505	7.6%
9	455	486	6.8%	310	450	45.1%	448	505	12.6%
10	338	347	2.7%	441	446	1.1%	469	513	9.4%
11	400	391	-2.2%	400	407	1.7%	496	520	4.7%
12	345	391	13.4%	448	499	11.4%	469	516	10.0%
Average	-	-	**9.6%**	-	-	**7.7%**	-	-	**6.9%**

Table 3.11: Updated Calibration Coefficients - Flow at 140 kPa Comparison

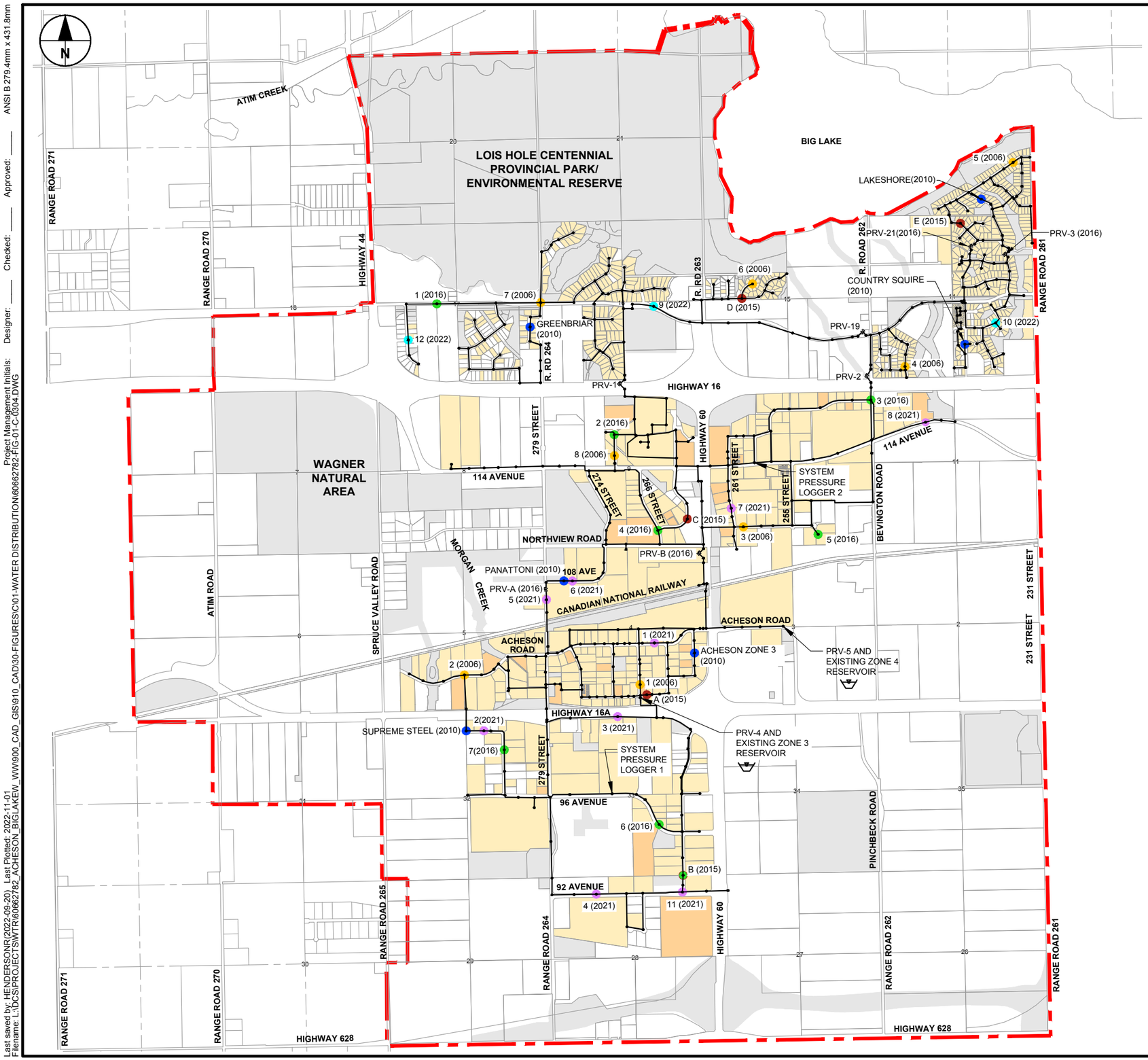
Test Number	Flow Hydrant		
	Tested (calculated) Flow at 140 kPa	Modelled Flow at 140 kPa	Percent Difference
	(L/s)	(L/s)	(%)
1	183	261	42.7%
2	235	244	3.9%
3	269	252	-6.5%
4	288	273	-5.1%
5	246	260	5.7%
6	250	249	-0.3%
7	296	283	-4.3%
8	247	225	-8.6%
9	175	223	27.7%
10	100	100	-0.5%
11	285	289	1.3%
12	62	78	25.2%
Average	-	-	**11.0%**

When comparing the results of the calibrations, during the pressure comparison the updated ‘C’ values resulted in a larger difference from the field-tested results than the 2016 Study ‘C’ values. This is indicated by the average percent difference ranging from 5.5% to 6.5% from the monitored results for the 2016 Study values, increasing to 6.9% to 9.6% off for the updated ‘C’ values. However, the average percent difference for the available fire flow condition dropped from an average of 13.9% utilizing the 2016 ‘C’ values, to 11.0% with the updated ‘C’ values.

In both conditions, the modelled results compared the available flow at 140 kPa are, in general, further from the field-tested results. As discussed previously, the flow at 140 kPa is an extrapolation of the field-tested data and does not consider whether additional pumps could turn on. In addition, the system demand of the ABLA water distribution system varies significantly throughout the day. If the demand at the time of the test was higher than the average demand that day, the model would overestimate the available fire flow. Therefore, a perfect calibration is not achievable.

For the purposes of this assessment, the results of both calibrations are acceptable, but it is recommended to use the 2016 Study 'C' values for the remainder of the assessment. These values were chosen because the results of the pressure comparison more closely represented the measured data, and for the available flow comparison, 8 of the 12 tests were within approximately 10% of the measured data, which is typical for model accuracy. The recommended 'C' values are as follows:

- PVC, HDPE, and Steel pipes: C = 120
- Asbestos Cement: C = 110



LEGEND

- STUDY AREA
- SCHEMATIC NODE
- EXISTING SCHEMATIC PIPE
- EXISTING PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NOT TO BE SERVICED

HYDRANT TEST LOCATIONS

- 8 (2006) — 2006 HYDRANT TEST LOCATION
- GREENBRIAR (2010) — 2010 HYDRANT TEST LOCATION
- A (2015) — 2015 HYDRANT TEST LOCATION
- 5 (2016) — 2016 STATIC PRESSURE TEST LOCATION
- 3 (2021) — 2021 HYDRANT TEST LOCATION
- 12 (2022) — 2022 HYDRANT TEST LOCATION

0 1000 2000 m

1:40000

AECOM

Figure: 3.4

HYDRANT TEST LOCATIONS

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

Last saved by: HENDERSONR(2022-09-20) Last Plotted: 2022-11-01
Filename: L:\DCS\PROJECT\SWTR\60662782_ACHESON_BIGLAKE\W_WW900_CAD_GIS\910_CAD\30-FIGURES\C\01-WATER DISTRIBUTION\60662782-FIG-01-C-0004.DWG
Project Management Initials: Designer: Checked: Approved: ANSI B 279.4mm x 431.8mm

3.3.2 Design Criteria

The following sections detail the design criteria used for the water distribution system model development and assessment. In general, the design standards are based on Parkland County Engineering Design Standards dated June 2014 (amended March 2015). AECOM conducted a design standards comparison to other similar municipalities. A table comparing the relevant water distribution standards is provided in Appendix A.

3.3.2.1 Residential Areas

For the residential areas, the County Standards specify an average day demand of 350 L/person/day, with peaking factors of 2 and 3 times the average day demand for maximum day demand and peak hour demands, respectively.

The water consumption records discussed in Section 3.2 were used to determine the current water demand within the Big Lake area to evaluate actual water demand trends against County Standards. As discussed in Section 2.4, the existing serviced population within the study area was estimated to be 1,696 persons. Based on the billing data, the existing average day residential water consumption is 174 L/person/day.

As discussed in Section 3.2, billing data was provided by the County which was geospatially referenced. This data was utilized to assign the actual existing residential demand (based on the billing data) within the model at the corresponding nodes.

For Near Future and Long Term development scenarios, the current County design standard of 350 L/person/day was applied to new development, while existing developments continued to be simulated at the existing rates based on consumer billing data as described in Section 3.2. The Ultimate development stage considers full build-out of the entire study area and assumes redevelopment of the existing developed area at a rate of 350 L/person/day.

It is recommended to consider updating the design standard for residential water consumption from a rate of 350 L/person/day to between 220-250 L/person/day for future development. As discussed above, the average water consumption for the Big Lake residential area is 174 L/person/day, which has decreased since the previous Studies. This trend is consistent with other municipalities who are also seeing a per capita decrease in water usage.

A sensitivity analysis was conducted to determine the impact of utilizing the smaller design rates to determine the impact on flow rates and system recommendations. At 350 L/person/day, the Ultimate development residential ADD is 16.6 L/s, at 220 L/person/day the ADD drops to 11.7 L/s, and if the actual rate of 174 L/person/day were used, the ADD would drop to 10.0 L/s. Therefore, for the purposes of this assessment the pipe sizing would be governed by the required fire flow (230 L/s) and the impact of the design rate does not impact the recommendations of this report. In addition, in most low demand cases the pipe sizing is governed by the minimum pipe size requirement. The recommendation to lower the design standard is made to represent actual water consumption more closely, while leaving some factor of safety if consumption trends change, while not doubling the actual consumption based on billing records.

3.3.2.2 Industrial Areas

For industrial areas, the County Standards indicate an average water consumption rate of 6,000 L/ha/day for industrial developments, with peaking factors of 2 and 3 times for maximum day demand and peak hour demand, respectively.

The water billing consumption records discussed in Section 3.2 were utilized to determine the water demand within the Acheson Industrial Area. Based on the consumption parcel data provided by the County and the serviced industrial lots that have active water billing accounts, the average water consumption is approximately 1,200 L/ha/day.

A list of high demand users and their annual consumption was developed based on the water consumption records provided by the County. Tables B.1 and Figure B.1 in Appendix B provide a breakdown of the top 30 high demand users and their water consumption by area (L/ha/d). Based on the consumption data provided by the County, in 2021, the highest demand users ranged from 2,000 L/ha/day to 26,800 L/ha/day. In 2021, the highest demand user by area is a cement and aggregates supplier with 26,800 L/ha/day.

The billings records were utilized to assess the industrial water consumption to determine the overall water consumption, and the approximate difference in consumption between high demand users and the remaining users. A summary of the industrial water consumption is shown in Table 3.12, as well as in Appendix B.

Table 3.12: Industrial Area Water Consumption Summary

Industrial Users	Industrial Area (ha)	Industrial Average Day Demand (L/ha/day)
Top 30 Demand Users	80	5900
Remaining Users	654	515
Total / Average All Users	734	1200

Similar to the residential demand, the parcel data was utilized to spatially distribute the existing water demand based on the billing data provided at the corresponding model nodes.

For Near Future and Long Term development scenarios, a rate of 6,000 L/ha/day was applied to new development, while existing developments were simulated at the existing rates based on consumer billing data as described in Section 3.2. For the Ultimate development, a rate of 6,000 L/ha/day was applied to all industrial properties, including existing developments, to simulate re-development of existing development areas. This design rate was utilized to provide sufficient capacity and flexibility in the system to service various types of future development, including industrial processing facilities and hotels.

3.3.2.3 Peaking Factors

As discussed in Section 3.2, the existing water demand provided by the County was utilized to determine peaking factors for Maximum Day Demand (MDD) and Peak Hour Demand (PHD). The 2021 peaking factors determined for the Existing system scenario are 1.65 and 3.72 for MDD and PHD, respectively. It is recommended to utilize these values for the existing development areas for the assessment. These values are considered conservative as 2021 was a hot, dry year.

For future development areas, it is recommended to use peaking factors of 2 and 3 for MDD and PHD, respectively based on County Standards. These values will be utilized for both residential and non-residential development areas.

3.3.2.4 Fire Flows

The fire flow requirements for the various land uses based on County Standards are summarized below:

- Single Family Residential: 60 L/s
- Multi-Family Residential: 90 L/s
- Walk-up Apartments: 115 L/s
- Industrial: 230 L/s

In comparable communities, the fire flow requirements for single family residential range from 75 to 115 L/s; for multi family residential range from 114 L/s to 227 L/s. The fire flow requirements for industrial areas vary from 220 L/s to 300 L/s in comparable communities, with an average of 250 L/s. The fire flow requirement in the County Standards of 230 L/s for industrial areas is in line with the requirements of other communities and will be used for this assessment.

Fire flow durations are based on recommendations of the Fire Underwriters Survey published in the Water Supply for Public Fire Protection 1999 report. For a fire flow of 230 L/s, the corresponding required duration is 3.0 hours.

3.3.2.5 Pipe Size Requirements

The County Standards specify the following minimum pipe diameters for distribution mains:

- For a residential development, minimum pipe size shall be 200 mm.
- For an industrial development, minimum pipe size shall be 300 mm.

County Standards, and other municipality standards, do not specify whether the minimum diameter references inside diameter or outside diameter. For the purposes of this study, recommended pipe diameters are proposed as inside diameter (ID). During design stages of crossings that require HDPE pipe material rather than PVC, the pipe wall thickness should be calculated on a case by case basis.

Minimum pipe diameters required by other communities are comparable to the requirements of the County Standards. For residential developments, the minimum pipe sizes range from 150 to 200 mm, and for industrial developments the minimum pipe size varies from 250 mm to 300 mm.

The County Standards also state that distribution mains shall be looped whenever possible. In the case of a dead end main, the maximum number of single family services shall not exceed twenty.

3.3.2.6 Pipe Velocity Requirements

Currently, Parkland County does not have a velocity requirement for water distribution systems. With respect to minimum velocity, looped water distribution systems are sufficient to limit the maximum water age, and therefore, minimum velocity was not assessed during this study. At locations with long dead ends, flushing is recommended to alleviate stagnant water issues. Water age is further discussed in Section 6.

With respect to maximum water velocity, the generally accepted maximum velocity during non-emergency scenarios is 3.0 m/s and is recommended for this this Study.

3.3.2.7 Minimum Pressure Requirements

The County Standards require the minimum residual pressure at ground elevation in the system to be between 350 kPa (50 psi) and 550 kPa (80 psi) during peak hour demand except at the hydrant used to fight a fire. The residual pressure at a hydrant used to fight a fire may be a minimum of 150 kPa (22 psi) during peak hour demand.

Based on the review of comparable communities, the minimum pressure requirements during normal operating conditions vary from 280 kPa (40 psi) to 350 kPa (50 psi), which is consistent with the requirements from the County Standards. In comparable communities, the recommended minimum residual pressure during a fire flow scenario varies between 140 and 150 kPa, which are also consistent with the requirements of the County Standards.

It is recommended to update County Standards as follows, to clarify the pressure requirements:

- During normal operating conditions (Average Day Demand), the system pressure at ground elevation in the system should be between 350 kPa (50 psi) and 550 kPa (80 psi).
- During high demand conditions (Peak Hour Demand), the minimum operating pressure should be greater than 350 kPa (50 psi).
- During a maximum day demand plus fire flow scenario, the minimum residual pressure at any point within the system should be greater than 150 kPa (22 psi).

This update impacts the analysis in two ways. First, it changes the fire flow analysis from peak hour plus fire to maximum day demand plus fire. Maximum day demand plus fire analysis is common engineering practice, and this would align County Standards with other communities. Second, it changes the 150 kPa residual pressure from only at the flowing hydrant, to throughout the system. The current standard requires 350 kPa residual at all locations except the flowing hydrant. Maintaining a residual pressure of 350 kPa at all other locations would result in significant improvement requirements throughout the system. Particularly at locations that have a high ground elevation that drop to 350 kPa due to the ground elevation, rather than insufficient system pressure. For the purposes of this study a minimum residual pressure of 150 kPa in the system was considered during a maximum day demand plus fire flow scenario.

3.3.2.8 Private Fire Pumps

Several of the industries within the Acheson Industrial Area have privately owned fire pumps within their properties to provide on-site fire protection; however, at this time an inventory of private fire pumps is not available. Depending on the size of the fire pumps, there is potential for the pumps to draw the pressure in the distribution system below the minimum of 150 kPa.

To maintain the pressure in the distribution system, County Standards require that a pressure sustaining valve (PSV) be installed at the property line.

If a private fire pump can operate within the capacity of the distribution system, no additional components are required. However, if a private fire pump is capable of providing a higher flow than the ABLA distribution system is designed to supply, an on-site reservoir should be required. To determine if an on-site reservoir is required, the simulated flow at the property line can be compared to the required flow. If the required flows are greater than the simulated available flow, the supplementary flows would need to be provided from an on-site reservoir.

There are locations within the Acheson Industrial Area, where existing developments have private fire pumps without the protection of a pressure sustaining valve. As described in the NFPA 24: Standard for the Installation of Private Fire Service Mains and Their Appurtenances, Section 1.3.2, "*in cases where the authority having jurisdiction (AHJ) determines that the existing situation presents an unacceptable degree of risk, the AHJ shall be permitted to apply retroactively any portions of this standard deemed necessary*." Based on this clause, the standards for private connections to water systems could potentially be retroactively enforced.

3.3.2.9 Design Criteria Summary

Table 3.13 provides a summary of the design criteria utilized for this Study.

Table 3.13: Design Criteria Summary

Criteria	Description	Current Parkland County Standard	Value Utilized in Study	Recommended Value	Source
Residential Water Demands	Existing Development Area	-	174 L/capita/day	-	Water Consumption Records
	Future Development Area	350 L/capita/day	350 L/capita/day	220-250 L/capita/day	County Standards
Industrial Water Demands	Existing Normal Demand Users	-	1,200 L/ha/day	-	Water Consumption Records
	Existing High Demand Users	-	5,900 L/ha/day	-	Water Consumption Records
	Near Future & Long Term Development	6000 L/ha/day	6,000 L/ha/day	-	County Standards
Industrial Water Demands (Ultimate)	All Users	6000 L/ha/day	6,000 L/ha/day	-	County Standards
Peaking Factors	Existing MDD	-	1.65	-	Water Consumption Records
	Existing PHD	-	3.72	-	Water Consumption Records
	Future MDD	2	2	-	County Standards
	Future PHD	3	3	-	County Standards
Fire Flow	Single Family Residential	60 L/s	60 L/s	-	County Standards
	Industrial	230 L/s	230 L/s	-	County Standards
Minimum Pipe Requirements	Residential	200 mm	200 mm	-	County Standards
	Industrial	300 mm	300 mm	-	County Standards
Maximum Water Velocity	All Scenarios	-	3.0 m/s	3.0 m/s	Recommendation
Minimum Pressure Requirements	Fire Flow	150 kPa (PHD+FF)	150 kPa (MDD+FF)	150 kPa (MDD+FF)	Recommendation*
	Peak Hour Demand	350 kPa	350 kPa	-	County Standards
	Residential Properties	350 kPa	350 kPa	-	County Standards

**See Section 3.3.2.7 for recommendation clarification.*

3.3.3 System Demand Summary

Based on the consumption rates and design criteria in the above sections, the water demand was calculated for the Existing, Near Future, Long Term, and Ultimate development scenarios. In summary, for Near Future and Long Term development scenarios, rates of 6,000 L/ha/day (industrial) and 350 L/capita/day (residential) were applied to new development, while existing development were simulated at the existing rates based on 2020 consumer billing data as described in Section 3.2. For the Ultimate development, a rate of 6,000 L/ha/day was applied to all industrial properties, and a rate of 350 L/capita/day was applied to all residential areas to allow for re-development. The Truck Fill and Barrell Fill demands were estimated by matching the growth rate throughout each development scenario. Table 3.14 summarizes the water demand for each development scenario.

Table 3.14: Water Demand Projection

Development Scenario	Truck + Barrel Fill ADD (L/s)	ADD (L/s)	MDD (L/s)	MDD + 230 L/s Fire (L/s)	PHD (L/s)
Existing	1.2	19.5	32.2	262	73
Near Future	4.3	73	146	376	219
Long Term	7.4	124	248	478	372
Ultimate	15.3	257	514	744	772

3.4 Existing System Evaluation

The following sections describe the analysis of the existing ABLA water distribution system, which was assessed for following criteria:

- Storage Capacity
- Pumping Capacity
- Distribution System Capacity

The storage capacity was assessed by comparing the total available storage to regulatory storage guidelines and recommendations. The assessment determines whether there is sufficient storage during an emergency scenario, such as if the supply line from the CRPWSC were temporarily out of service or during a high demand scenario such as a fire.

The pumping capacity was assessed by comparing the total capacity of the ABLA pumphouses to the calculated demand for the system. This assessment determines whether the pumphouses have sufficient capacity to provide water to the distribution system during high demand scenarios, such as peak hour demand as well as maximum day demand plus fire flow scenarios.

The distribution system capacity includes a hydraulic analysis for the following demand conditions:

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

In general, the ADD and PHD scenarios were assessed to determine whether system pressures were maintained within the acceptable pressure ranges during normal operating and peak demand conditions. The MDD+FF is assessed to determine the available fire flow throughout the water distribution system during a maximum day demand scenario, as well as the system residual pressure during a fire.

The existing system analysis is discussed in the following sections, and a schematic representation of the ADD, MDD+FF, and PHD results are shown on Figures 3.5 to 3.7, respectively.

3.4.1 Existing Storage Capacity Assessment

As discussed in Section 3.1.2, the ABLA water distribution system consists of two reservoirs with storage capacities of 4,334 m^3 and 8,860 m^3 at the Zone 3 and Zone 4 reservoirs, respectively. The total storage capacity for the ABLA water distribution system is 13,195 m^3.

There are two storage capacity guidelines. The first is a requirement of the 2022 draft supply agreement with the CRPWSC, and the other is a required minimum as outlined by the April 2012 Alberta Environment (AEP) Standards and Guidelines for Municipal Waterworks. The CRPWSC requires a storage capacity of two times the ADD for supply interruption plus fire storage. The design of two average days storage enables the CRPWSC to assist the RWCG in the collective management of high 5 day draw rates from EPCOR such that there are minimal financial rate implications to the regional customers. In addition, two times the average daily truck and barrel fill was included in the storage requirement.

The AEP Standards require storage for fire flow, plus 25% of the MDD for equalization storage, plus 15% of the ADD for emergency storage. Equalization storage is assigned to meet the daily fluctuation of demand above supply rates, and the emergency storage is allocated for routine disruption of the supply line for maintenance. For the calculations, two times the ADD for the Truck and Barrel fill was added to the storage requirement. Tables 3.15 and 3.16 summarize the storage requirement based on each guideline.

Table 3.15: Existing Storage Requirement – CRPWSC Requirement

Description	Storage Requirement (m^3)
Fire Storage: 230 L/s for 3.0 hours	2,484
Emergency Storage: 2 x ADD (ADD = 19.54 L/s)	3,376.7
Subtotal	**5,860.7**
Truck and Barrel Fill Storage: 2 x TF+BF ADD (ADD = 1.16 L/s)	200.4
Total	**6,061.1**

Table 3.16: Existing Storage Requirement – AEP Requirement

Description	Storage Requirement (m^3)
Fire Storage: 230 L/s for 3.0 hours	2,484
Equalization Storage: 25% MDD (MDD = 32.24 L/s)	696.4
Emergency Storage: 15% ADD (ADD = 19.54 L/s)	253.3
Subtotal	**3,433.7**
Truck and Barrel Fill Storage: 2 x TF+BF ADD (ADD = 1.16 L/s)	200.4
Total	**3,634.1**

Based on Tables 3.14 and 3.15, the existing storage capacity of 13,195 m^3 is sufficient to meet the storage requirement for both the CRPWSC and AEP.

The required storage for fire flow is 2,484 m^3. If the total fire storage was to be maintained in each reservoir (2,484 m^3 in each reservoir), this would correspond to a depth of 2.22 m and 1.24 m in the Zone 3 and Zone 4 reservoirs, respectively. However, during a fire scenario, both reservoirs will likely be in operation and thus the fire storage requirement is shared between the reservoirs. When drawing 230 L/s during a fire with Zone 4 acting as the lead pump, this would activate pumps P-101 through P-104 at Zone 3. At this hydrant flow rate, this would draw 185 L/s and 78 L/s from the Zone 3 and Zone 4 reservoirs, respectively. This flow rate equates to volumes of 1,993 m^3 and 839 m^3 during a 3 hour fire, which equates to depths in the reservoirs of 1.78 m and 0.42 m at Zone 3 and Zone 4, respectively. These depths are the minimum depth that should be maintained within the reservoirs for fire protection. Operations has indicated that they do not operate the reservoirs lower than 1.0 m at which elevation they will shut off.

3.4.2 Existing Pumping Capacity Assessment

As discussed in Section 3.1.3, the existing pumping capacity at the Zone 3 and Zone 4 pumphouses is 345 L/s with standby capacity of 128 L/s at Zone 3, and 105 L/s at Zone 4.

Based on the AEP recommendations for pumping, water distribution systems should be designed with at least two pumps. With one pump out of service, the remaining pumps should be able to deliver the maximum hourly design flow at not less than 150 kPa. Standby power or an auxiliary gas or diesel powered pump should be provided to supply water during power outages or other emergencies.

With respect to the above requirement, the Existing system PHD within Acheson is 66.8 L/s. With the largest pump at each reservoir out of service (P-105 at Zone 3 and P-2 at Zone 4), the total existing pumping capacity is 345 L/s and meets the AEP pumping requirement.

However, it is recommended in the existing condition to consider the governing demand scenario as the MDD+FF rate, which would equate to a flow rate of 262.2 L/s (230 L/s for fire plus 32.2 L/s for MDD). This flow rate would be the maximum design flow that the ABLA water distribution system would reasonably experience. As discussed previously, with the largest pump out of service, the pumping capacity of 345 L/s is sufficient for the existing condition.

During an emergency scenario in which power is lost at the Zone 3 and Zone 4 pumphouses, there are gas powered generators situated at pumps P-105 in Zone 3 and one pump at Zone 4. The total pumping capacity during a power loss is 233 L/s, which is less than the maximum day demand plus fire flow rate for the existing development condition (262 L/s).

3.4.3 System Evaluation for Existing Development Conditions

A hydraulic analysis was conducted on the ALBA existing water distribution system for the following demand conditions:

- Average Day Demand
- Maximum Day Demand plus Fire Flow
- Peak Hour Demand

As noted previously, the average day demand and peak hour demand scenarios were assessed to determine the system pressures during normal operating conditions and peak demand scenarios, respectively. The maximum day demand scenario was assessed to determine the available fire flow throughout the water distribution system during a maximum day demand scenario. The results of the analysis are discussed in the following sections, and a schematic representation of the ADD, MDD+FF, and PHD results are shown on Figures 3.5 to 3.7, respectively.

3.4.3.1 Existing System Analysis - Average Day Demand

The average day demand for ABLA is 19.5 L/s. Therefore, the system was assessed assuming normal daytime operation with one pump at Zone 4 (P-1) in operation. Table 3.17 summarizes the system results for the Existing System average day demand analysis.

Table 3.17: Existing System Analysis – Average Day Demand

Total Nodes	Minimum Pressure	Maximum Pressure	Nodes with High Pressure (>700 kPa)		Nodes with Low Pressure (<350 kPa)	
(No.)	(kPa)	(kPa)	(No.)	(%)	(No.)	(%)
435	356	664	0	0	0	0

As seen in Table 3.17 and Figure 3.5, during ADD all nodes within the water distribution system are within the recommended pressure range of 350 kPa to 700 kPa. The maximum pressure in the system is 664 kPa at J-192 and the minimum pressure occurs at J-567 with 356 kPa.

Figure 3.5 shows the water velocity for the Existing system during ADD. The recommended maximum velocity is 3.0 m/s; as shown on the figure, all pipes within the system are below 0.5 m/s during ADD. The detailed simulation results for the Existing system are included in Appendix C.

The system PRVs were assessed to determine the flow through each PRV during ADD to better understand how water is conveyed throughout the system. Table 3.18 summarizes the PRV flows in the existing development condition.

Table 3.18: Existing System Analysis – PRV Analysis

PRV (Name)	PRV Diameter	Downstream Pressure Setting		Flow Rate	Velocity
(-)	(inches)	(kPa)	HGL (m)	(L/s)	(m/s)
PRV-A (Navistar)	12	400	743.8	0	0
PRV-B (HWY 60)	4	386	745.4	8.21	1.05
	12	386	745.4	0	0
PRV-1 (Royal Springs)	3	450	716.2	1.52	0.33
	10	430	714.3	0	0
PRV-2 (Countryside Ravines)	3	441	734.0	2.58	0.57
	8	414	731.2	0	0
PRV-3 (Helenslea East)	2	393	716.7	0	0
	6	379	715.4	0	0
PRV-19 (Walker Lake to Lakeshore)	3	330	716.2	0.23	0.05
	10	311	714.3	0	0
PRV-21 (Helenslea West)	3	455	716.9	0.95	0.21
	6	434	714.8	0	0

Due to the existing pressure settings, PRV-A and PRV-3 are not providing flow during ADD. There are two main concerns about the current pressure settings of the PRVs:

- PRV-A and PRV-B create the pressure boundary from Zone 3 and 4 into Zones 1 and 2. The hydraulic gradeline resulting from the pressure setting of PRV-B is 1.6 m higher than that of PRV-A, which does not allow PRV-A to open during normal operating conditions. The result is that Zones 1 and 2, as well as the Big Lake area, are supplied by only one feed during normal operating conditions until the system demand increases such that PRV-A can open. This has potential to cause some stagnant water issues near PRV-A.
- PRV-3 and PRV-21 create the pressure boundary the northern portion of the Helenslea neighborhood. The hydraulic gradeline resulting from the pressure setting of PRV-21 is 0.6 m higher than PRV-3, which does not allow PRV-3 to open during normal operating conditions.

It is recommended to review the settings of the PRVs to optimize the system pressure. Recommended settings are provided in Section 3.5, System Improvements.

3.4.3.2 Existing System Analysis – Maximum Day Demand plus Fire

The maximum day demand for ABLA is 32.2 L/s, plus fire flows of 60 L/s and 230 L/s for residential and non-residential development, respectively. The system was assessed assuming a fire during the day (when MDD conditions occur) and thus P-1 at Zone 4 in operation and pumps P-101, P-102, P-103, and P-104 in operation at Zone 3. Table 3.19 summarizes the system results for the Existing system MDD+FF analysis.

Table 3.19: Existing System Analysis – Maximum Day Demand plus Fire Flow

Residential Nodes	Non-Residential Nodes	Residential Nodes Failing Fire Flow Requirements		Non-Residential Nodes Failing Fire Flow Requirements		Total Nodes Failing Fire Flow Requirements	
(No.)	(No.)	(No.)	(%)	(No.)	(%)	(No.)	(%)
196	239	1	0.5	4	1.7	5	1.1

As seen in Table 3.19, as well as on Figure 3.6, during the maximum day demand plus fire flow analysis there is 1 residential node and 4 non-residential nodes that fail to meet the fire flow requirements. The failing residential node (J-480) is located in the east section of the Big Lake residential area. This node is within 2 L/s of the required 60 L/s fire flow for residential development. The four failing non-residential nodes include nodes J-497, J-498, J-579 and J-701 and are located at the end of the water main line in Zone 1 on 114 Avenue. These nodes can supply approximately 205 L/s to 228 L/s. As discussed further in Section 4, additional lots are proposed to be developed in the Near Future and Long Term scenarios, and a water main is proposed along 279 Street between Northview Road and 114 Avenue. With this additional mainline, the system meets the fire flow requirement along 114 Avenue. Detailed results are summarized in Appendix C.

3.4.3.3 Existing System Analysis - Peak Hour Demand

The peak hour demand for ABLA is 72.7 L/s. The system was assessed assuming daytime operation with one pump at Zone 4 (P-1) in operation. Table 3.20 summarizes the system results for the Existing system PHD analysis.

Table 3.20: Existing System Analysis – Peak Hour Demand

Total Nodes	Minimum Pressure	Maximum Pressure	Nodes with High Pressure (>700 kPa)		Nodes with Low Pressure (<350 kPa)	
(No.)	(kPa)	(kPa)	(No.)	(%)	(No.)	(%)
435	354	662	0	0	0	0

As seen in Table 3.20 and Figure 3.7, during PHD all nodes within the water distribution system are within the recommended pressure range of 350 kPa to 700 kPa. The maximum pressure in the system is 662 kPa at J-192 and the minimum pressure occurs at J-567 with 354 kPa.

Figure 3.7 shows the water velocity for the existing system during PHD, with detailed results provided in Appendix C. All pipes in the system are below 0.5 m/s with the exception of the single 300 mm diameter feed from the Zone 4 reservoir which is reaching up to slightly above 1 m/s. The water velocity during peak hour demand for the Existing system is acceptable at below 3.0 m/s.

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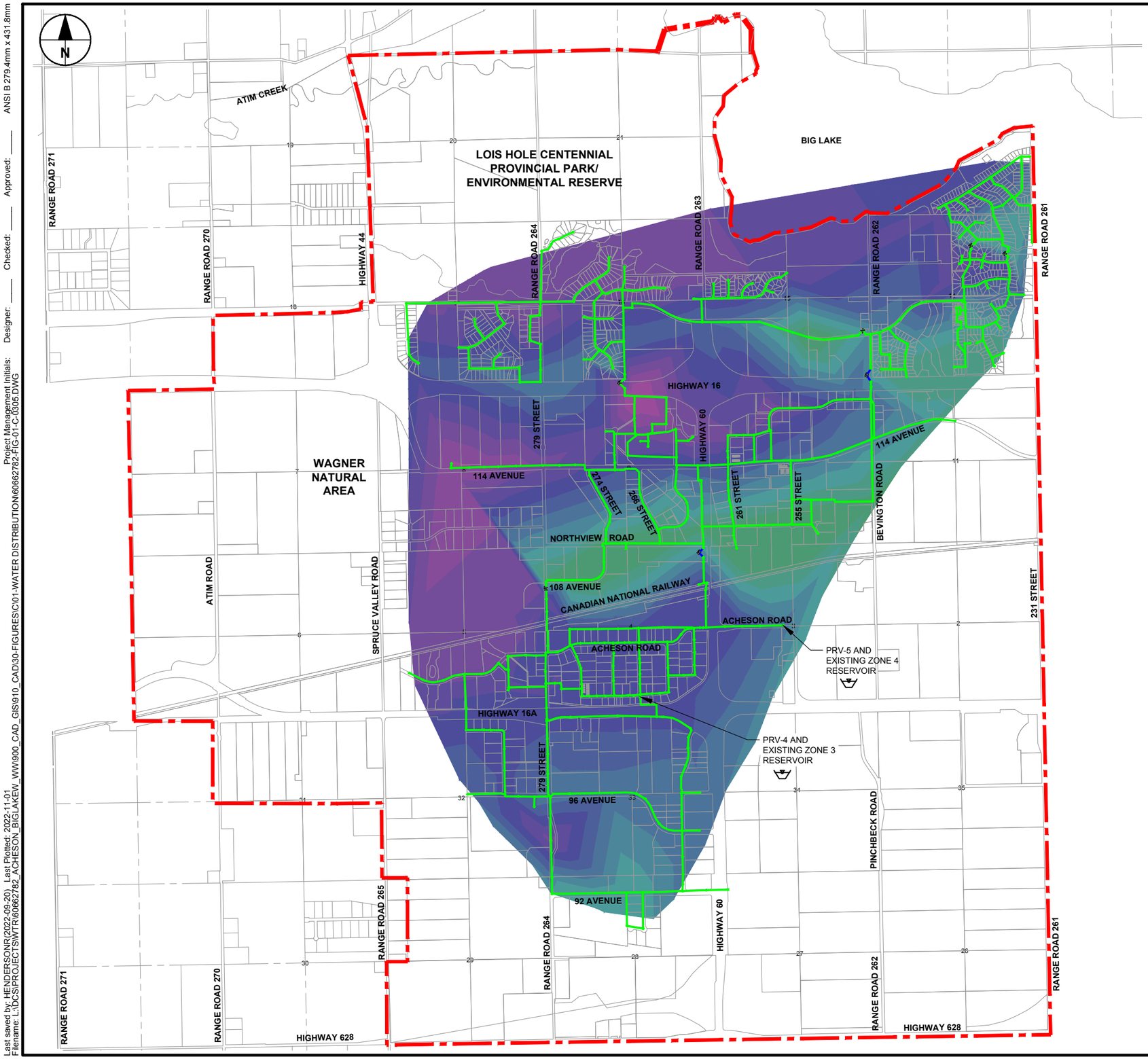


LEGEND

- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR

PRESSURE

- <350 kPa
- 350-700 kPa
- >700 kPa

PIPE VELOCITY

- <0.5 m/s
- 0.5 - 1.0 m/s
- 1.0 - 2.0 m/s
- 2.0 - 3.0 m/s
- >3.0 m/s

PRESSURE (KPa): 675, 650, 625, 600, 575, 550, 525, 500, 475, 450, 425, 400, 375

0 1000 2000 m

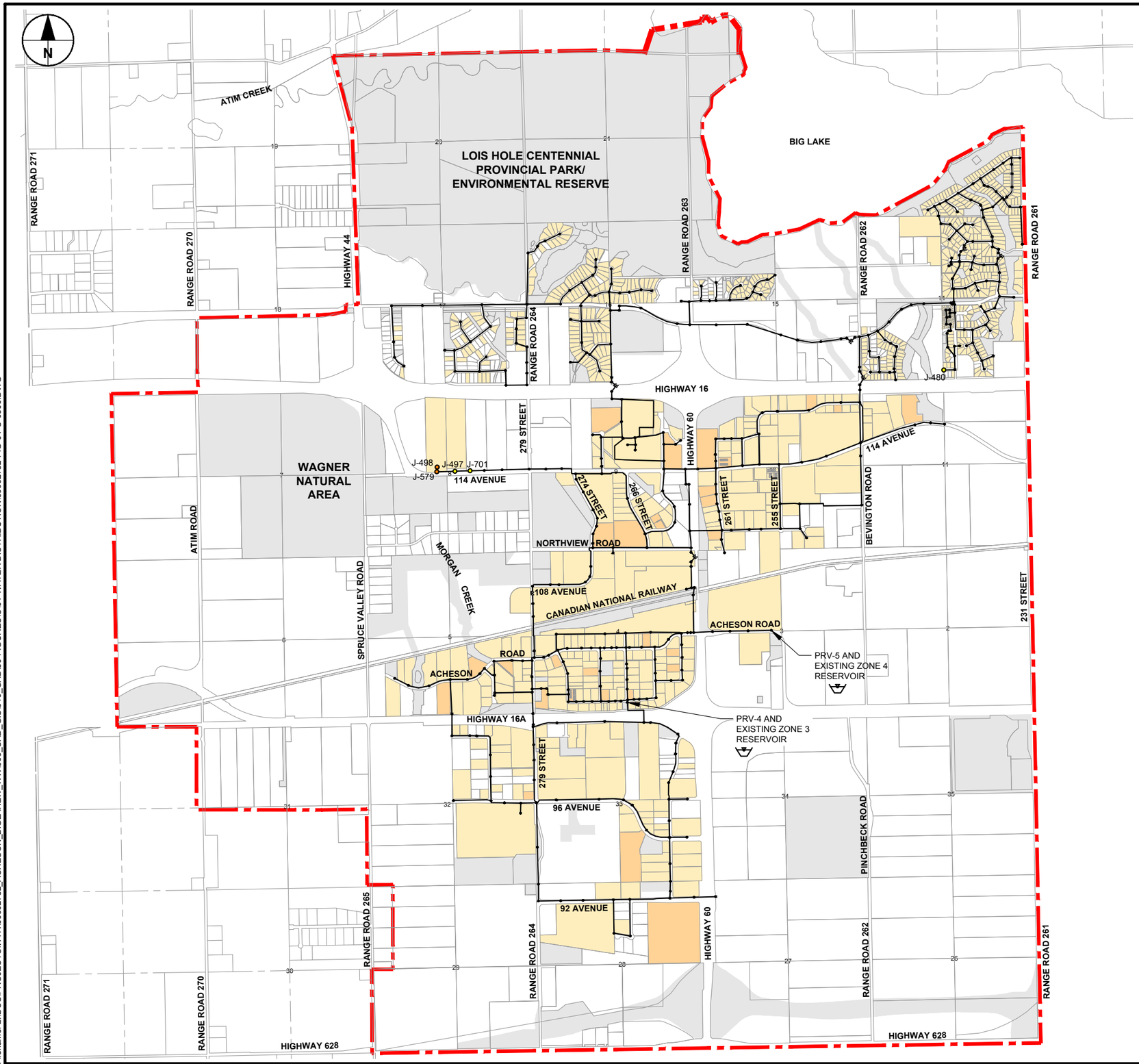
1:40000

AECOM

Figure: 3.5

EXISTING WATER DISTRIBUTION SYSTEM RESULTS AVERAGE DAY DEMAND

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022



LEGEND

- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- EXISTING SCHEMATIC PIPE

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NOT TO BE SERVICED

FIRE FLOW

- SCHEMATIC NODES THAT SATISFY FIRE FLOW CONSTRAINTS
- AVAILABLE FIRE FLOW IS 90 - 100% OF REQUIRED FIRE FLOW
- AVAILABLE FIRE FLOW IS 70 - 90% OF REQUIRED FIRE FLOW
- AVAILABLE FIRE FLOW IS < 70% OF REQUIRED FIRE FLOW

0 1000 2000 m

1:40000

AECOM

Figure: 3.6

EXISTING WATER DISTRIBUTION SYSTEM RESULTS
MAXIMUM DAY DEMAND PLUS FIRE FLOW

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

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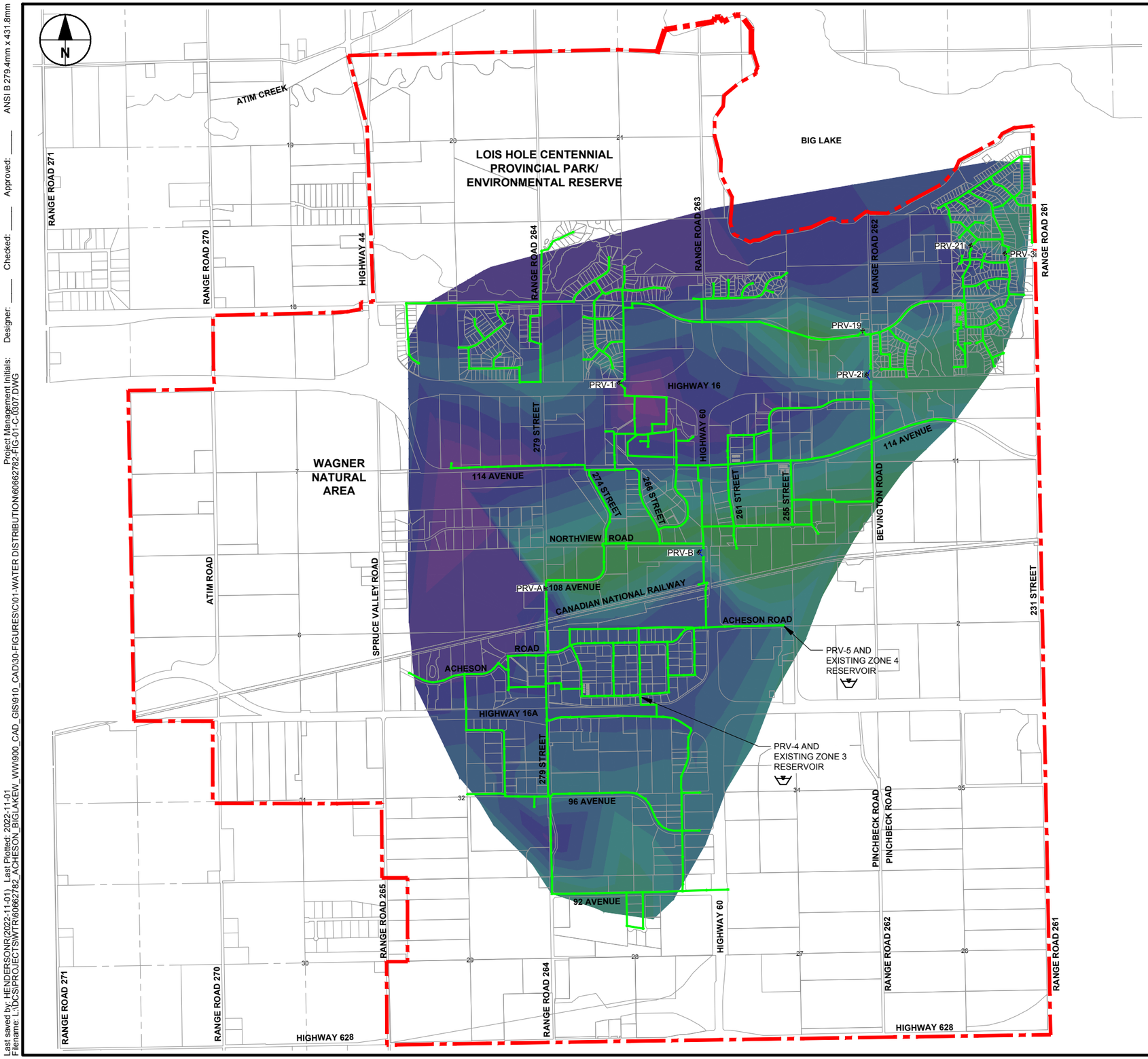


LEGEND

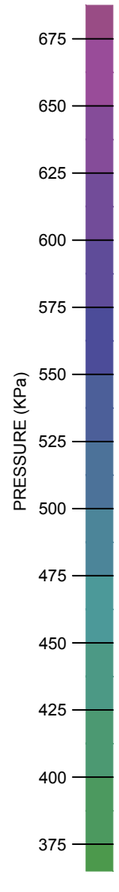
- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR

PRESSURE

- <350 kPa
- 350-700 kPa
- >700 kPa

PIPE VELOCITY

- <0.5 m/s
- 0.5 - 1.0 m/s
- 1.0 - 2.0 m/s
- 2.0 - 3.0 m/s
- >3.0 m/s



0 1000 2000 m

1:40000

AECOM

Figure: 3.7

EXISTING WATER DISTRIBUTION SYSTEM RESULTS
PEAK HOUR DEMAND

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

3.5 System Improvements

3.5.1 System Deficiencies

Based on the Existing system analysis, the water distribution system is sufficient to maintain system pressures during average day demand and peak hour demand without system improvements. During the maximum day demand scenario, the water distribution system is sufficient to supply available fire flows throughout the system with the exception of deficiencies in the west portion of Zone 1 as seen on Figure 3.6. In this area, the available fire flow is approximately 2 to 25 L/s below the required fire flow. Water piping improvements are not recommended at this time because system looping will be completed in the Near Future development scenario as development proceeds, which will increase the available fire flow to meet the requirements.

In the existing system, PRV-A consists of a single valve, while all other PRV's in the system that have a smaller diameter low flow and larger high flow valve for fire flow scenarios. It is recommended to replace PRV-A with the two-valve configuration.

Throughout the ABLA water distribution system there are a number of long dead end pipes that exceed the County Standard of a maximum dead end of 120 m or servicing of 20 single family residential lots. The distribution mains that are long dead ends include:

- 1,396 m from node J-472 to J-498 in Zone 1
- 553 m from Node J-168 to J-613 in Zone 2
- 600 m from Node J-1 to J-454 in Zone 3
- 1,518 m from J-347 to J-371 in Big Lake

Water age is a primary concern for long dead ends. Section 6 provides a detailed discussion of water age in the system. Each of the long dead ends were evaluated for water age. The generally accepted maximum accepted water age is 14 days. The water age in the long dead ends is as follows:

- Zone 1 dead end: approximately 200 hours (8.3 days)
- Zone 2 dead end: approximately 250 hours (10.4 days)
- Zone 3 dead end: approximately 265 hours (11 days)
- Big Lake dead end: > 500 hours (>21 days)

Based on the water age in the Big Lake dead end, bi-weekly flushing of this line is recommended. The high water age in this line is due to the very limited demand along this line, which currently services three homes. As more lots are developed the demand along this line will increase which will improve the water age. In addition, in the Near Future development condition a loop between J-371 and J-350 is proposed which will improve the water age.

Though not observed in the model, there is observed stagnation in Zone 5, and Parkland County Operators regularly perform uni-directional flushing in the area. When valves are closed during uni-directional flushing program maintenance along 96 Avenue, low pressures are occurring in the line. Investigation to determine the cause is recommended.

Currently, all of the dead ends have sufficient pressures and available fire flow to meet development standards and therefore are not currently recommended for improvements, as during further development scenarios these distribution mains are intended to be looped.

As discussed in Section 3.4.3.1, the current pressure settings of the PRVs are preventing PRV-A and PRV-21 from opening during normal operating conditions. Currently, all of Zone 1 and 2, as well as Big Lake are serviced by a single feed through PRV-B until the flow is high enough that the pressure in the system drops enough to allow PRV-A to open. Similarly, the pressure settings of PRV-3 and PRV-21 are proposed to be equaled so that flow is supplied through each PRV. Table 3.21 shows the proposed pressure settings.

Table 3.21: Existing System Improvements – PRV Settings

PRV	PRV Diameter (inches)	PRV Elevation (m)	Proposed Downstream Pressure Setting (kPa)	(psi)	HGL (m)
PRV-A	12	703	412	60	745
PRV-B	4	706	383	55	745
	12		373	54	744
PRV-1	3	670	449	65	716
	10		130	62	714
PRV-2	3	689	441	64	734
	8		414	60	731
PRV-3	2	676.7	393	57	717
	6		379	55	715
PRV-21	3	670.5	456	66	717
	6		446	63	715
PRV-19	3	685	330	48	716
	10		311	45	714

3.5.2 Existing System with Improvements – Analysis

The Existing system with proposed PRV pressure changes was assessed similarly to the existing development condition during average day demand, maximum day demand plus fire, and peak hour demand. The Existing system with improvements is shown on Figure 3.8 and detailed results are included in Appendix D.

With respect to the ADD and PHD pressure simulation, in general the water system is sufficient to provide adequate pressure within the recommended range of 350 kPa to 700 kPa for both scenarios with all locations within the model falling within the recommended range. During ADD, the highest and lowest pressures within the system are 660 kPa and 352 kPa, respectively. During PHD, the highest and lowest pressures within the system are 659 kPa and 351 kPa, respectively. The system pressure during ADD is shown on Figure 3.9.

Figure 3.9 shows the water velocity for the Existing system with improvements during ADD. As seen on Figure 3.9, all pipes in the system are below 0.5 m/s.

Table 3.22 summarizes the updated results of the MDD+FF analysis and are shown schematically on Figure 3.10.

Table 3.22: Existing System with Improvements Analysis – Maximum Day Demand plus Fire Flow

Residential Nodes	Non-Residential Nodes	Residential Nodes Failing Fire Flow Requirements		Non-Residential Nodes Failing Fire Flow Requirements		Total Nodes Failing Fire Flow Requirements	
(No.)	(No.)	(No.)	(%)	(No.)	(%)	(No.)	(%)
196	239	1	0.5	4	1.7	5	1.1

As seen in Table 3.22 and Figure 3.10, the results of the MDD+FF analysis is equivalent to the existing system. There is 1 residential node and 4 non-residential nodes that fail to meet the fire flow requirements. The failing residential node is located in the east section of the Big Lake residential area. The simulated available fire flow is within 2 L/s of the required 60 L/s fire flow for residential development. The four failing non-residential nodes include nodes J-497, J-498, J-579 and J-701 and are located at the end of the water main line in Zone 1 on 114 Avenue. These nodes can supply approximately 205 L/s to 229 L/s. As discussed further in Section 4, as more lots are developed in the Near Future and Long Term scenarios, a water main running north along 279 Street will be able to provide the necessary fire flows to these nodes. No additional watermain upgrades are proposed for the existing system.

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LOIS HOLE CENTENNIAL PROVINCIAL PARK/ ENVIRONMENTAL RESERVE

BIG LAKE

WAGNER NATURAL AREA

HIGHWAY 44

RANGE ROAD 264

RANGE ROAD 263

RANGE ROAD 262

RANGE ROAD 261

HIGHWAY 16

279 STREET

114 AVENUE

274 STREET

266 ST

NORTHVIEW RD

SPRUCE VALLEY ROAD

CANADIAN NATIONAL RAILWAY

ACHESON ROAD

BEVINGTON ROAD

HIGHWAY 16A

96 AVENUE

HIGHWAY 60

92 AVENUE

PINCHBECK ROAD

Greenbriar

Panattoni

Acheson Zone 3

Supreme Steel

Lakeshore

Country Squire

PRV-5 AND EXISTING ZONE 4 RESERVOIR

PRV-4 AND EXISTING ZONE 3 RESERVOIR

DETAIL 1

DETAIL 1

LEGEND

- STUDY AREA
- SCHEMATIC NODE
- EXISTING PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NOT TO BE SERVICED

PIPE DIAMETERS

- EXISTING 150 mm SCHEMATIC PIPE
- EXISTING 200 mm SCHEMATIC PIPE
- EXISTING 250 mm SCHEMATIC PIPE
- EXISTING 265 mm SCHEMATIC PIPE
- EXISTING 300 mm SCHEMATIC PIPE
- EXISTING 322 mm SCHEMATIC PIPE
- EXISTING 350 mm SCHEMATIC PIPE
- EXISTING 400 mm SCHEMATIC PIPE
- EXISTING 410 mm SCHEMATIC PIPE
- EXISTING 500 mm SCHEMATIC PIPE
- EXISTING 600 mm SCHEMATIC PIPE

NOTE: UPGRADES INCLUDE CHANGES TO PRV SETTINGS AND PRV-A CONFIGURATION.

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Figure: 3.8

EXISTING WATER DISTRIBUTION SYSTEM WITH IMPROVEMENTS

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

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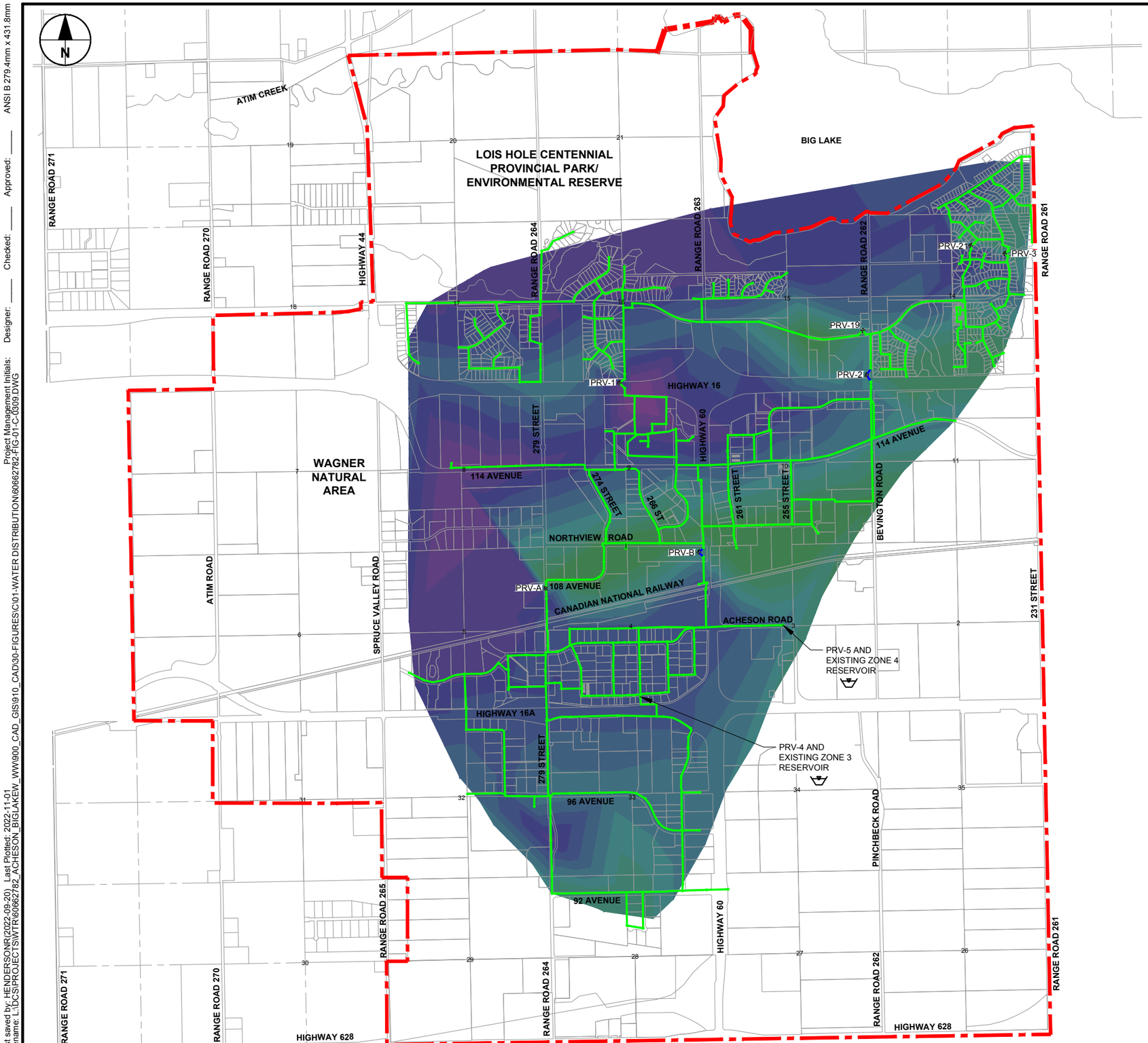
Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm



LEGEND

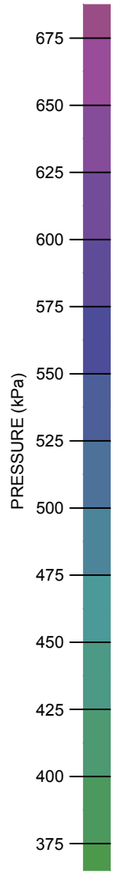
- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR

PRESSURE

- <350 kPa
- 350-700 kPa
- >700 kPa

PIPE VELOCITY

- <0.5 m/s
- 0.5 - 1.0 m/s
- 1.0 - 2.0 m/s
- 2.0 - 3.0 m/s
- >3.0 m/s



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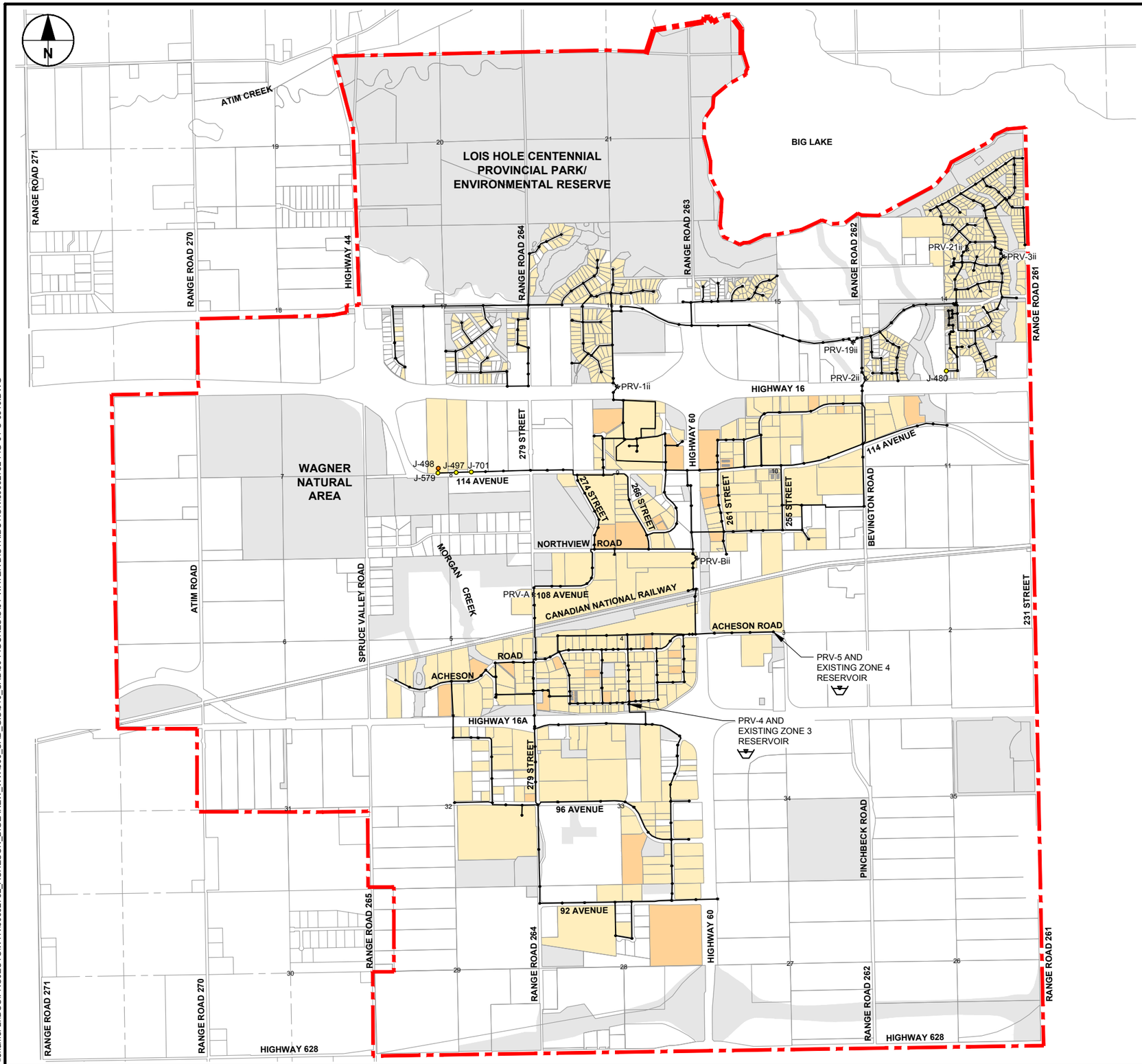
AECOM

Figure: 3.9

EXISTING WATER DISTRIBUTION SYSTEM WITH IMPROVEMENTS RESULTS AVERAGE DAY DEMAND

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022



LEGEND

- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- EXISTING SCHEMATIC PIPE

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NOT TO BE SERVICED

FIRE FLOW

- SCHEMATIC NODES THAT SATISFY FIRE FLOW CONSTRAINTS
- AVAILABLE FIRE FLOW IS 90 - 100% OF REQUIRED FIRE FLOW
- AVAILABLE FIRE FLOW IS 70 - 90% OF REQUIRED FIRE FLOW
- AVAILABLE FIRE FLOW IS < 70% OF REQUIRED FIRE FLOW

0 1000 2000 m

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AECOM

Figure: 3.10

EXISTING WATER DISTRIBUTION SYSTEM WITH IMPROVEMENTS RESULTS
MAXIMUM DAY DEMAND PLUS FIRE FLOW

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

Project Management Initials: Designer: Checked: Approved: ANSI B 279.4mm x 431.8mm

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4. Future Development Servicing

The Future development within the ABLA was assessed to determine the servicing requirements in the following development scenarios:

- Near Future: 5-10 year development horizon.
- Long Term: 10-25 year development horizon.
- Ultimate Development: Full development of the ABLA with redevelopment of existing areas.

The following sections detail the future system assessment including water demand projection, storage and pumping requirements, and hydraulic analysis during ADD, MDD+FF, and PHD scenarios. Please note that while the projected development area for each Near Future and Long Term have been identified and assume that the Near Future and Long Term development area is fully serviced, the demand within the development area may not be fully realized on year one of the development horizon. Therefore, to determine approximate timing for large system upgrades such as storage and pumping expansions, a consumption projection was considered for the implementation plan, based off historical water consumption growth which is presented in Section 5.

4.1 Water Demand Projection

The water demand was calculated for the Near Future, Long Term, and Ultimate scenarios based on the design criteria presented in Section 3.4.2. For Near Future and Long Term development scenarios, rates of 6,000 L/ha/day (industrial) and 350 L/capita/day (residential) were applied to new development, while existing development were simulated at the existing rates based on 2020 consumer billing data as described in Section 3.2. For the Ultimate development, a rate of 6,000 L/ha/day was applied to all industrial properties to allow for re-development, and a rate of 350 L/capita/day was applied to all residential areas. The Truck Fill and Barrell Fill demands were estimated by matching the growth rate throughout each development scenario. Table 4.1 summarizes the water demand for each development scenario.

Table 4.1: Water Demand Projection

Development Scenario	Truck + Barrel Fill ADD (L/s)	ADD (L/s)	MDD (L/s)	MDD + 230 L/s Fire (L/s)	PHD (L/s)
Existing System	1.2	19.5	32.2	262	73
Near Future	4.3	73	146	376	219
Long Term	7.4	124	248	478	372
Ultimate	15.3	257	514	744	772

4.2 Future Storage Requirement

The future development storage requirement has been assessed based on providing storage for 2 times the average day demand (ADD) plus fire flows be provided, as per the CRPWSC requirement. The future storage requirements were based on the projected land use and development calculation as shown in Section 4.1 which assumes the development area is 100% serviced. Table 4.2 summarizes the storage requirement for the Ultimate development scenario.

Table 4.2: CRPWSC Water Storage Requirement for Ultimate Development Condition

Description	Storage Requirement (m^3)
Fire Storage: 230 L/s for 3.0 hours	2,484
Emergency Storage: 2 x ADD (ADD = 257 L/s)	44,448
Subtotal	46,932
Truck and Barrel Fill Storage: 2 x TF+BF ADD (ADD = 15.3 L/s)	2,639
Total	**49,571**

For the Ultimate development, a total storage of approximately 49,570 m^3 is required to meet the CPRWSC requirement. The existing storage capacity is 13,195 m^3; therefore, an additional 36,400 m^3 would be required. As discussed, this assessment assumes full redevelopment of the ABLA, and all lots fully serviced.

The total storage capacity based on the AEP requirement was also assessed for the Ultimate development scenario and was calculated to be 19,600 m^3. Based on the existing storage capacity, an additional 6,400 m^3 would be required to meet the AEP requirements.

The CRPWSC storage recommendations for the Near Future and Long Term development conditions are summarized in Tables 4.3 and 4.4. The existing available storage does not meet the CRPWSC requirement for the Near Future and Long Term development conditions. However, as presented in Section 5, only a single reservoir expansion is anticipated within the 25 year development horizon if a realistic lot fill rate within developments is considered. This is due to the discrepancy in water demand growth within the ABLA compared to the anticipated development area which may not be fully serviced upon development of the area. Section 5 presents an analysis of the water demand projection and provides the anticipated timing for storage expansion.

Table 4.3: CRPWSC Water Storage Requirement for Near Future Development Condition

Description	Storage Requirement (m^3)
Fire Storage: 230 L/s for 3.0 hours	2,484
Emergency Storage: 2 x ADD (ADD = 73 L/s)	12,611
Subtotal	15,095
Truck and Barrel Fill Storage: 2 x TF+BF ADD (ADD = 4.3 L/s)	749
Total	**15,844**

A total storage of approximately 15,850 m^3 is required to meet the CRPWSC requirements for the Near Future development. The existing storage capacity is 13,195 m^3; therefore, an additional 2,650 m^3 would be required to meet the CRPWSC water storage requirement. In order to meet the AEP requirements in the Near Future development scenario, a total storage of approximately 7,330 m^3 is required. The existing storage capacity is sufficient to meet AEP requirements in the Near Future development scenario.

Table 4.4: CRPWSC Water Storage Requirement for Long Term Development Condition

Description	Storage Requirement (m^3)
Fire Storage: 230 L/s for 3.0 hours	2,484
Emergency Storage: 2 x ADD (ADD = 124 L/s)	21,436
Subtotal	23,920
Truck and Barrel Fill Storage: 2 x TF+BF ADD (ADD = 7.4 L/s)	1,273
Total	**25,192**

For the Long Term development, a total storage of approximately 25,200 m^3 is required to meet the CRPWSC requirements. The existing storage capacity is 13,195 m^3; therefore, an additional 12,000 m^3 would be required. The AEP storage requirements for the Long Term development scenario is 10,700 m^3. The existing storage capacity is sufficient to meet AEP requirements in the Long Term development scenario.

To satisfy the terms of the 2022 draft supply agreement with the CRPWSC and based on the high value industrial development within the Acheson Industrial Area, it is recommended to follow the CPRWSC requirements for storage capacity. The AEP required storage has been provided to provide a sensitivity analysis of the storage requirement. As discussed in Section 5, it is anticipated that not all lots will be serviced for the planned Near Future, and Long term development scenarios. The timing of storage expansion and recommendations are provided in Section 5.

4.3 Future Pumping Requirement

The future pumping requirements for the ABLA are based on the governing water demand as determined be the demand projection in Section 4.1. Table 4.5 summarizes the governing water demand for each development scenario.

Table 4.5: Pumping Requirements

Development Scenario	Governing Demand	Pumping Requirement (L/s)	Existing Pumping Capacity (L/s)	Additional Pumping Capacity Required (L/s)
Existing System	MDD plus Fire	262	345	0
Near Future	MDD plus Fire	376	345	31
Long Term	MDD plus Fire	478	345	133
Ultimate	PHD	772	345	427

As seen in Table 4.5, the governing demand scenario changes from MDD+FF to PHD during the Ultimate scenario, which occurs when the ADD of the system surpasses the fire flow requirement of 230 L/s.

During the Near Future, Long Term, and Ultimate development scenarios, the required pumping capacities are approximately 375 L/s, 480 L/s, and 775 L/s, respectively. The existing pumping capacity is 345 L/s, assuming with additional standby capacity of 128 L/s at the Zone 3 reservoir and 105 L/s at the Zone 4 reservoir. Therefore, additional pumping capacity (approximately 30 L/s) would be required for the fully serviced Near Future development condition, as well as additional capacity will be required to service the Long Term and Ultimate development.

Pumping capacity expansions are dependant on storage upgrades and the location of the storage. When the ADD reaches 62 L/s, a second expansion of the Zone 4 reservoir is required. At this time, it would be proposed to reconstruct the pumphouse at the Zone 4 reservoir and implement as staged pumphouse configuration similar to the Zone 3 pumphouse, with some smaller pumps that can handle lower flow conditions, and some large pumps to handle peak flow and emergency situations. The proposed pumphouse would have a total of 500 L/s capacity.

During the Long Term development an additional reservoir will be required which is proposed to be located in the west portion of Zone 3, known as the Zone 3 West reservoir. At the new reservoir, a pumpstation will be required, which is proposed to have a total capacity of 500 L/s. With this additional pumphouse the pumping requirement is met. During the detailed design stage of the new reservoir, it is recommended to determine if it is feasible to utilize the Zone 3 reservoir and pumphouse as the Truck Fill, or if the Zone 3 reservoir should be fully decommissioned and a new Truck Fill installed at the Zone 4 reservoir.

The proposed pumping capacity have been proposed conceptually and should be confirmed based on actual system demands and projections at the time of pumphouse design. Further discussion of the proposed pumping upgrades for the Near Future and Long Term are discussed in Section 4.5.2 and 4.5.4, respectively.

4.4 Future Pressure Zones and PRVs

As development proceeds, additional looping is proposed to provide sufficient water throughout the distribution system . In general, the boundaries of the pressure zone are recommended to remain the same as the existing condition; however, additional PRVs will be required to maintain the pressure zone boundaries as the development area expands. Table 4.6 summarizes the proposed PRVs and the hydraulic settings. Note that the pressures reported indicate the pressure at 3.5 m below ground elevation to represent the approximate depth at which a PRV is below ground. During the design stage of the PRVs, the depth of the PRV should be confirmed and the pressure setting adjusted to maintain the hydraulic grade line of the zone that the PRV is supplying water. For existing PRVs the design elevation of the PRV was used, and in cases where the PRV was designed with a low and high flow PRV in the same vault, the low flow value is presented. Figure 4.1 shows the proposed pressure zones and PRVs in the Ultimate buildout of the water distribution system.

Table 4.6: Future PRV Settings

PRV No.	Development Scenario	Supplying to Zone	PRV Elevation (m)	Pressure (kPa / psi)	Hydraulic Grade Line (m)
Zone 3 Reservoir*	Existing	3	-	480 / 70	765
Zone 4 Reservoir*	Existing	4	-	500 / 73	765
PRV-A (Navistar)	Existing	1	703	412 / 60	745
PRV-B (HWY 60)	Existing	2	706	383 / 56	745
PRV-1 (Royal Springs)	Existing	Big Lake West	673.9	381 / 55	716.2
PRV-2 (Countryside Ravines)	Existing	Big Lake East	689	441 / 64	734
PRV-3 (Helenslea East)	Existing	Helenslea East	676.7	415 / 60	719
PRV-19 (Walker Loop)	Existing	Big Lake	686.4	255 / 37	716.2
PRV-21 (Helenslea West)	Existing	Helenslea West	670.5	476 / 69	719
PRV-15	Near Future	2	705	392 / 57	745
PRV-16	Near Future	2	700	441 / 64	745
PRV-24	Near Future	Big Lake West	667	483 / 70	716.2
PRV-18	Long Term	3	706.2	577 / 84	765
PRV-25	Long Term	Big Lake East	666	520 / 75	719
PRV-14	Ultimate	1	705	392 / 57	745
PRV-17	Ultimate	Big Lake West	670	453 / 66	716.2

* Pressure at the pumphouses are maintained by the pumps rather than PRVs, values presented represent the pressure setting recommended at each pumphouse.

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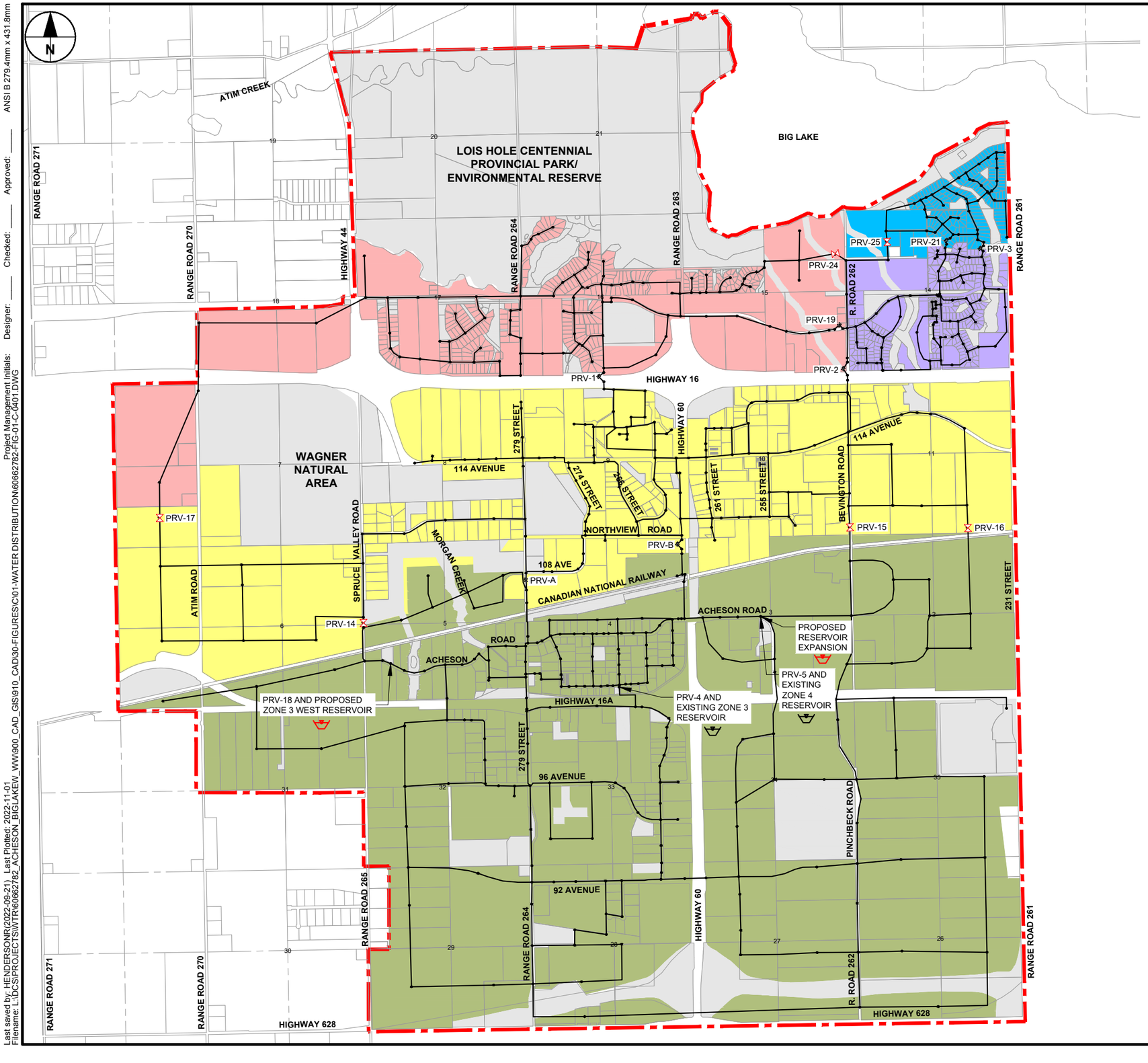

LEGEND

- STUDY AREA
- SCHEMATIC NODE
- SCHEMATIC PIPE
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR

PRESSURE ZONES

- ZONES 3 - 8 PRESSURE ZONE
- BIG LAKE WEST PRESSURE ZONE
- ZONES 1- 2 PRESSURE ZONE
- HELENSLEA SOUTH PRESSURE ZONE
- HELENSLEA NORTH PRESSURE ZONE
- NOT TO BE SERVICED

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Figure: 4.1

ULTIMATE WATER DISTRIBUTION SYSTEM
PRESSURE ZONES AND PRVS

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

4.5 Hydraulic Assessment

The water distribution system was evaluated for the Near Future, Long Term, and Ultimate development scenarios. The pipe layout for the future water system was assumed based on the available development staging plan and land use plan, shown on Figure 2.2. The pipe sizes required to service the future developments, as well as the schematic pipe layouts, are indicated on Figures 4.2, 4.6, and Figure 4.10, for the Near Future, Long Term, and Ultimate development scenarios, respectively.

4.5.1 Near Future Water Distribution System

In the Near Future system, the network was evaluated during the average day demand, maximum day demand plus fire flow, and peak hour demand scenarios. The Near Future water distribution system is shown on Figure 4.1, and the results of the ADD, MDD plus Fire, and PHD are shown on Figures 4.2-4.5, respectively. Tables 4.7 and 4.8 summarize the hydraulic analysis results for the pressure assessment (ADD and PHD), and available fire flow assessment (MDD plus Fire), respectively. Detailed simulation results for the Near Future system are provided in Appendix E.

The following pumps were active at each reservoir during the assessment:

- During ADD: Pump P-104 at Zone 4
- During MDD + Fire: Pump P-104 at Zone 4, Pumps P-103, P-101, P-102, and P-104 at Zone 3
- During PHD: Pump P-104 at Zone 4, Pumps P-103, P-101, and P-102 at Zone 3

Table 4.7: Near Future Development Pressure Assessment

Scenario	Total Number of Nodes	Minimum Pressure	Maximum Pressure	Nodes with High Pressure (>700 kPa)		Nodes with Low Pressure (<350 kPa)	
(-)	(No.)	(kPa)	(kPa)	(No.)	(%)	(No.)	(%)
ADD	488	352	683	0	0	0	0
PHD		351	682	0	0	0	0

During the average day demand scenario, the system was evaluated while running pump P-104 at the Zone 4 reservoir. No nodes were determined to be outside the recommended range of 350 kPa to 700 kPa. The minimum pressure located in the system was 352 kPa (51 psi) at nodes J-317 and J-567, and the maximum pressure found in the system was 683 kPa (99 psi) at node J-684.

During the peak hour demand scenario, the system was evaluated while running pump P-104 at Zone 4, and pumps P-103, P-101, and P-102 at the Zone 3 reservoir. No nodes were determined to be outside the recommended range of 350 kPa to 700 kPa. The minimum pressure located in the system was 351 kPa (51 psi) at nodes J-317 and J-567, and the maximum pressure found in the system was 682 kPa (99 psi) at node J-684.

Figures 4.3 and 4.5 show the water velocity for the Near Future system during ADD and PHD, respectively. As seen on Figure 4.3, all pipes in the Near Future system are below 0.5 m/s during ADD. During Near Future PHD, all pipes are below 0.5 m/s except for the single 300 mm diameter feed from the Zone 4 reservoir which is reaching up to 0.8 m/s, as well as the 200 mm line just south of Zone 3 crossing Highway 16A which line reaches 0.7 m/s. The water velocity during peak hour demand for the Near Future system is acceptable at below 3.0 m/s.

Table 4.8: Near Future Development MDD Plus Fire Flow Assessment

Residential Nodes	Non-Residential Nodes	Residential Nodes Failing Fire Flow Requirements		Non-Residential Nodes Failing Fire Flow Requirements		Total Nodes Failing Fire Flow Requirements	
(No.)	(No.)	(No.)	(%)	(No.)	(%)	(No.)	(%)
208	**280**	0	0%	2	0.7	2	0.4%

As seen in Table 4.8, during the Near Future maximum day demand plus fire flow analysis there are 2 non-residential nodes that fail to meet the fire flow requirements. As shown in Figures 4.2 and 4.4, the proposed water main line along 279 Street in Zone 1 provides fire flow to the nodes in the west area of Zone 1 along 114 Avenue.

- The two failing nodes are located just south of Highway 16A in Zone 6 (J-715 and J-696). These nodes will service the future soccer centre to be built in the Near Future at 10058 231 Street.

4.5.2 Near Future Improvements Summary

To provide water servicing for the Near Future development, the following improvements are recommended:

- System piping to provide water mains to Near Future development areas.
- Two highway N-S highway crossings at Highway 16A provide servicing to Near Future development areas and ensure that fire flow requirements are met.
- New PRVs 15,16 and 24 to maintain pressure boundaries.
- A reservoir expansion of the Zone 4 reservoir of 4,000 m^3.
- Replacement of the pumphouse at Zone 4 reservoir.

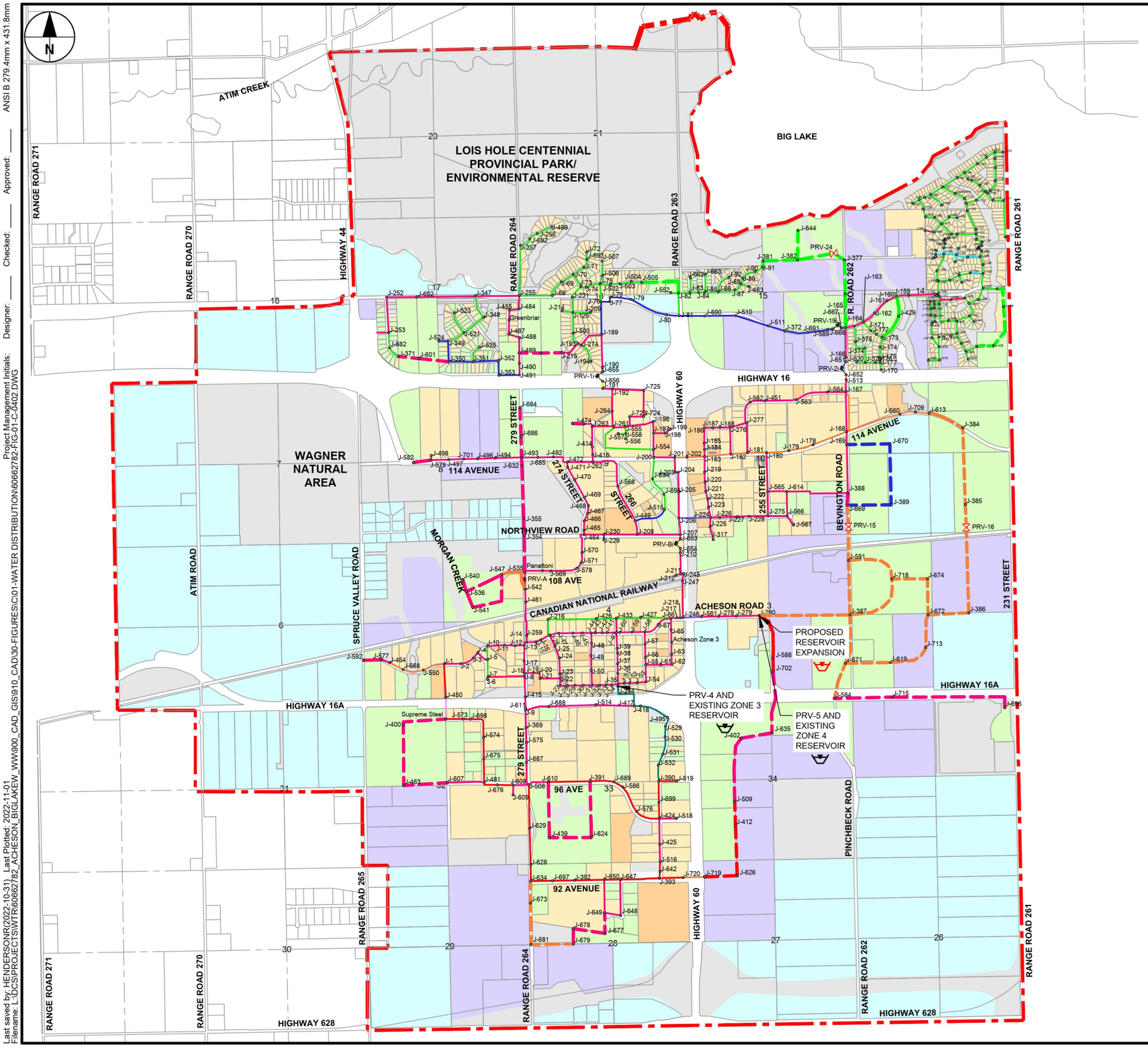
The Zone 4 reservoir expansion is required when the Average Day Demand for the water distribution system reaches 62 L/s. This will occur when approximately 85% (~800 ha) of the Near Future development area has been developed and serviced at 6000 L/ha/day in the industrial development area. It is proposed to expand the Zone 4 reservoir by 4,000 m^3. The size of the additional expansion of the reservoir was estimated based on the available space within the lot at the Zone 4 reservoir and the depth constraints of the existing reservoir facility. With a 4,000 m^3 expansion, the total storage at Zone 4 would be 12,861 m^3, which equates to a total storage capacity within the ABLA water distribution system of 17,195 m^3.

At the time of the next expansion of the Zone 4 reservoir, it is recommended to reconstruct the pumphouse at the Zone 4 reservoir to a more flexible design with pumps at varying capacity so that the pumphouse can supply during high and low demand periods. In general, the lifespan of a pump is 15 years and by the completion of the Near Future development the service life of the existing Zone 4 pumps will be over. It is proposed to install pumps that operate at approximately the same head as the existing Zone 4 pumps. Based on a pump elevation of 714 m, the pumps should operate to maintain a hydraulic grade line setpoint 765 m, which equates to an operating pressure of approximately 500 kPa (72.5 psi). The following pumps are conceptually recommended at the new pumphouse at the Zone 4 pumphouse. The final pump sizing should be confirmed during the design of the Zone 4 pumphouse expansion.

- One 50 L/s variable speed pump at 51 m head.
- Two 75 L/s variable speed pumps at 51 m head.
- Two 150 L/s constant speed pumps at 51 m head.

The 2016 Study recommended an additional crossing at 279 Street and HWY 16 from Zone 1 into Big Lake. This area was studied for both fire flow and pressure, and due to the proposed PRV settings and the recently commissioned Walker Lake to Lakeshore water line, the system is sufficient without this crossing. For the area to the west of HWY 44 and north of HWY 16, in the ultimate development is serviced by an additional crossing west of the interchange.

Similar to the 2016 Study, two N-S crossings are recommended across HWY 16A from Zone 4 to Zone 6; one at Bevington Road/Pinchbeck Road and another crossing to the west at 255 Street. These crossings and system piping provide service to Near Future development areas such as the future soccer centre to be built at 10058 231 Street. Two crossings are recommended for overall system performance and redundancy; however, depending on the staging of development, there may be an option to eliminate one of the crossings if a future east-west loop south of Hwy 16A is completed between 255 Street and Pinchbeck Road.



LEGEND

- STUDY AREA
- SCHEMATIC NODE
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NEAR FUTURE DEVELOPMENT
- LONG TERM DEVELOPMENT
- ULTIMATE DEVELOPMENT
- NOT TO BE SERVICED

PIPE DIAMETERS

- 150 mm SCHEMATIC PIPE
- 200 mm SCHEMATIC PIPE
- 250 mm SCHEMATIC PIPE
- 265 mm SCHEMATIC PIPE
- 300 mm SCHEMATIC PIPE
- 322 mm SCHEMATIC PIPE
- 350 mm SCHEMATIC PIPE
- 400 mm SCHEMATIC PIPE
- 410 mm SCHEMATIC PIPE
- 500 mm SCHEMATIC PIPE
- 600 mm SCHEMATIC PIPE
- PROPOSED 200 mm SCHEMATIC PIPE
- PROPOSED 250 mm SCHEMATIC PIPE
- PROPOSED 300 mm SCHEMATIC PIPE
- PROPOSED 350 mm SCHEMATIC PIPE
- PROPOSED 400 mm SCHEMATIC PIPE

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AECOM

Figure: 4.2

NEAR FUTURE WATER DISTRIBUTION SYSTEM

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

Project Management Initials: Designer: Checked: Approved: ANSI B 279.4mm x 431.8mm

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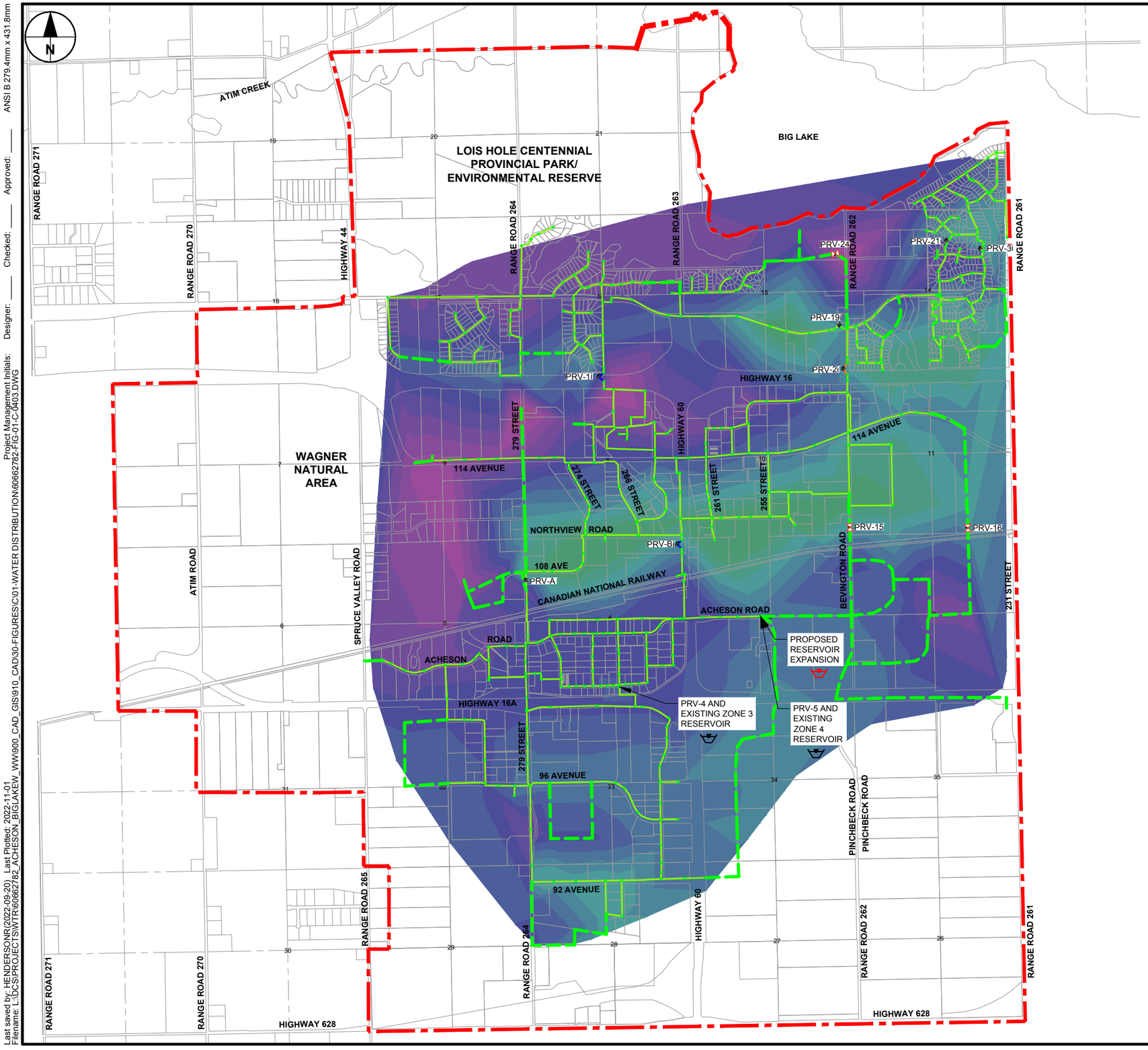

LEGEND

- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR

PRESSURE

- <350 kPa
- 350-700 kPa
- >700 kPa

SCHEMATIC PIPE

- PIPE
- PROPOSED PIPE

PIPE VELOCITY

- <0.5 m/s
- 0.5 - 1.0 m/s
- 1.0 - 2.0 m/s
- 2.0 - 3.0 m/s
- >3.0 m/s

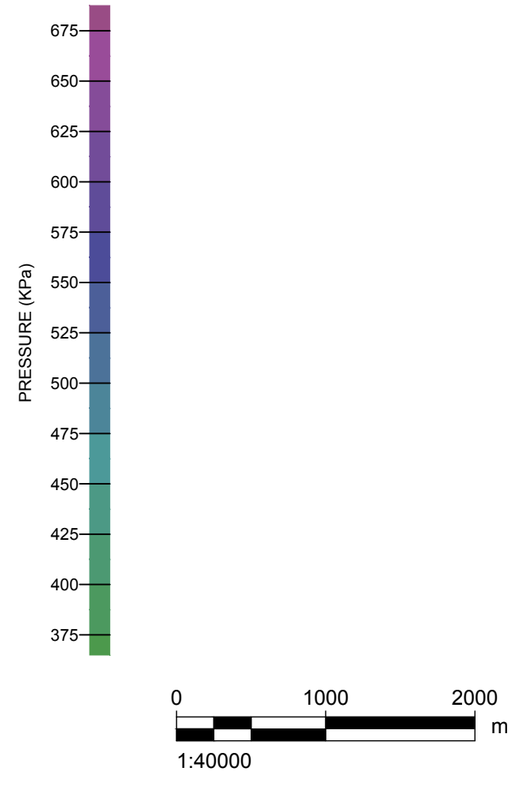

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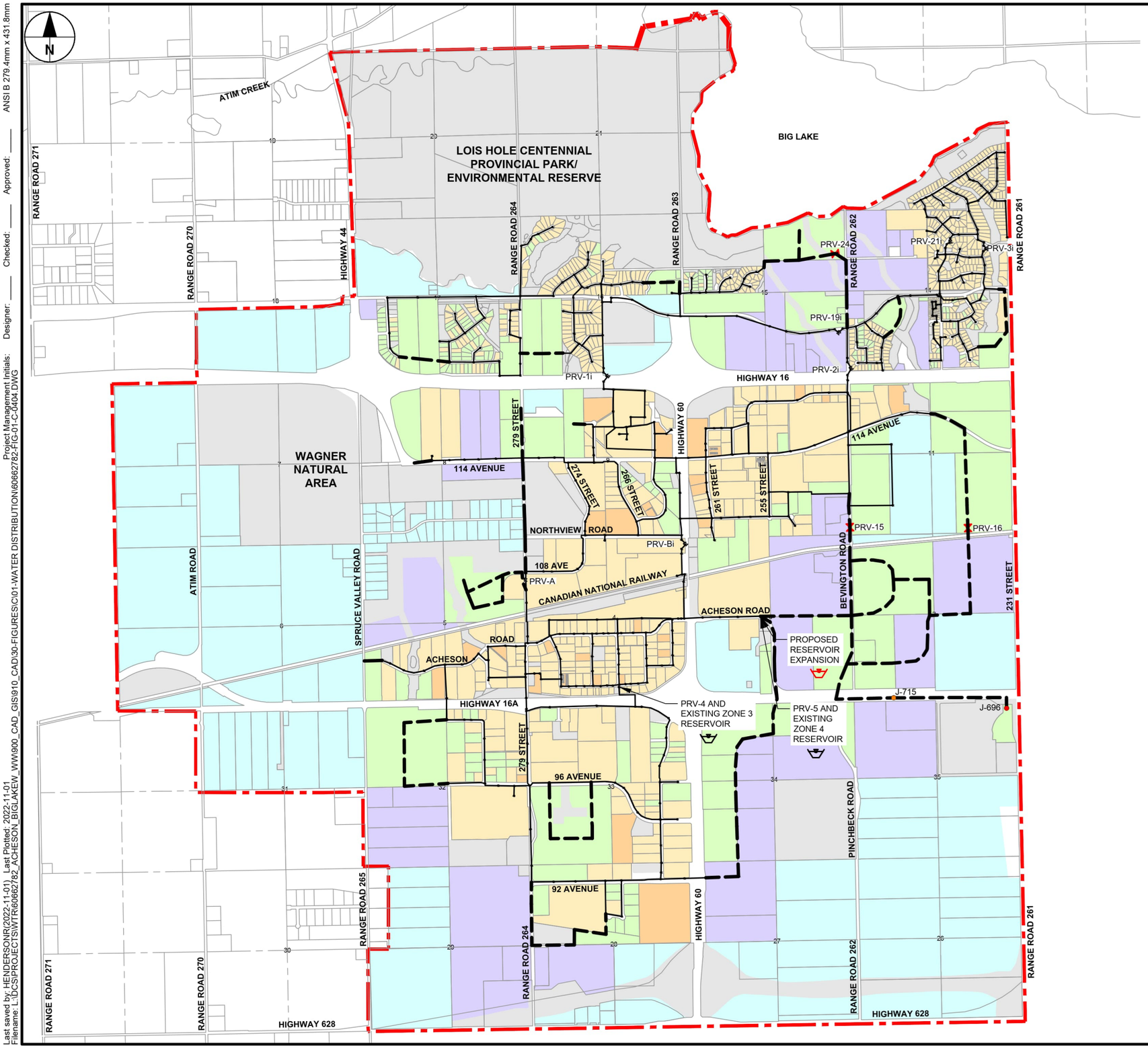
Figure: 4.3

NEAR FUTURE WATER DISTRIBUTION SYSTEM RESULTS
AVERAGE DAY DEMAND

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022



LEGEND

- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR

SCHEMATIC PIPE

- PIPE
- PROPOSED PIPE

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NEAR FUTURE DEVELOPMENT
- LONG TERM DEVELOPMENT
- ULTIMATE DEVELOPMENT
- NOT TO BE SERVICED

FIRE FLOW

- SCHEMATIC NODES THAT SATISFY FIRE FLOW CONSTRAINTS
- AVAILABLE FIRE FLOW IS 90 - 100% OF REQUIRED FIRE FLOW
- AVAILABLE FIRE FLOW IS 70 - 90% OF REQUIRED FIRE FLOW
- AVAILABLE FIRE FLOW IS < 70% OF REQUIRED FIRE FLOW

0 1000 2000 m

1:40000

AECOM

Figure: 4.4

NEAR FUTURE WATER DISTRIBUTION SYSTEM RESULTS
MAXIMUM DAY DEMAND PLUS FIRE FLOW

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

Last saved by: HENDERSONR(2022-11-01) Last Plotted: 2022-11-01
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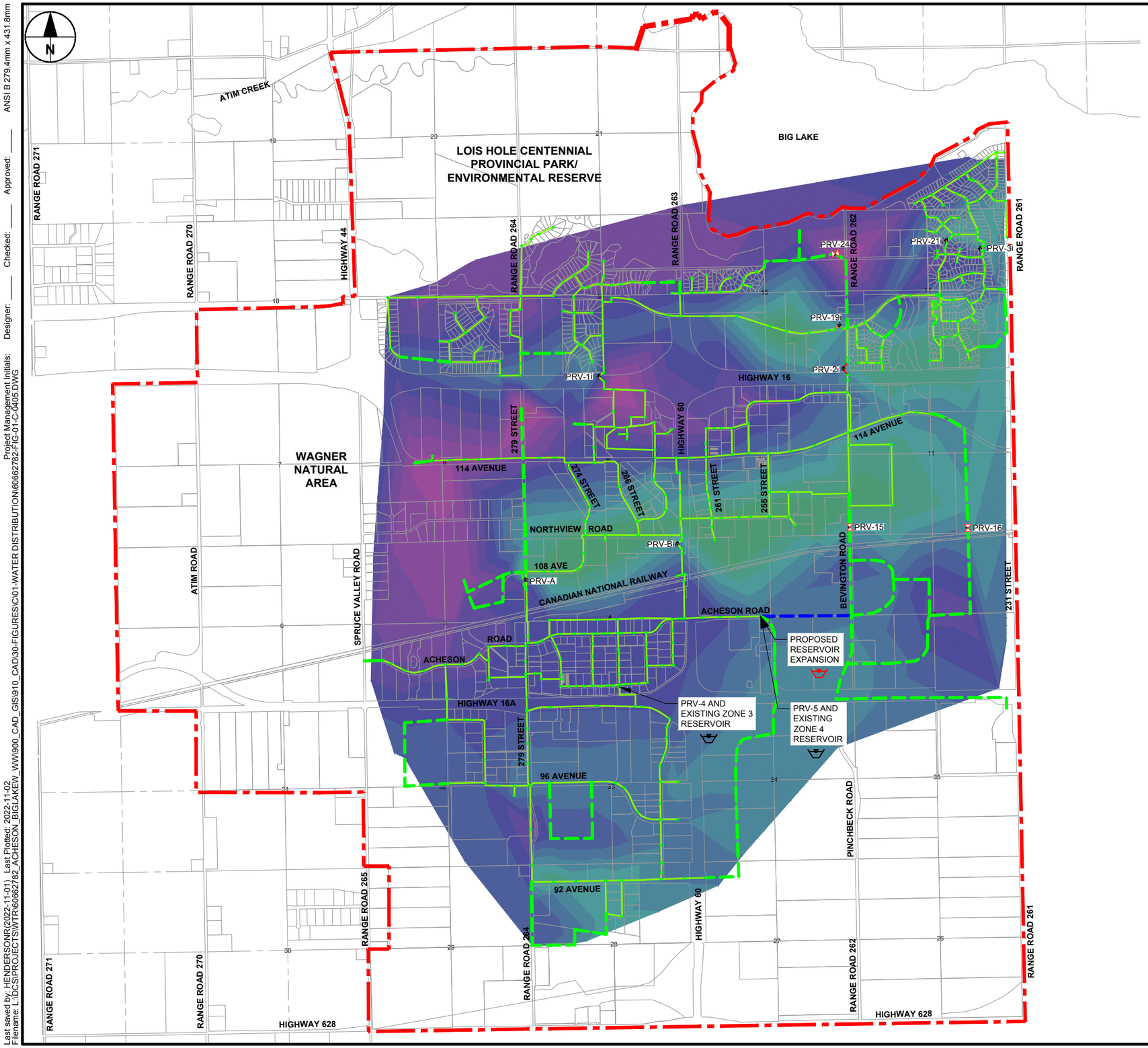


LEGEND

- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR

PRESSURE

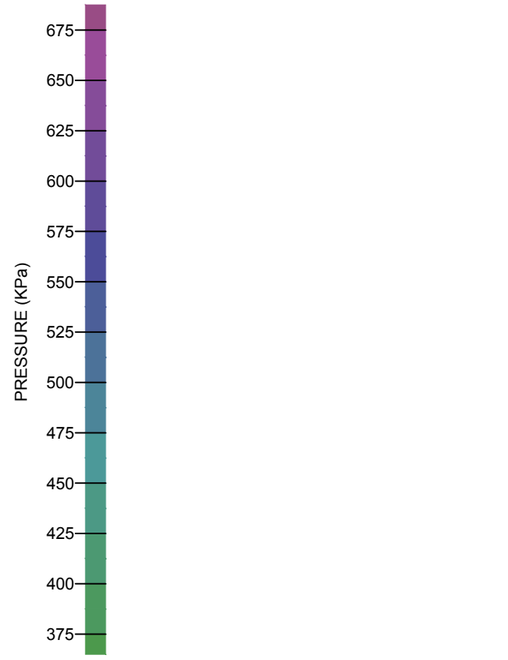
- <350 kPa
- 350-700 kPa
- >700 kPa

SCHEMATIC PIPE

- PIPE
- PROPOSED PIPE

PIPE VELOCITY

- <0.5 m/s
- 0.5 - 1.0 m/s
- 1.0 - 2.0 m/s
- 2.0 - 3.0 m/s
- >3.0 m/s



0 1000 2000 m

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AECOM

Figure: 4.5

NEAR FUTURE WATER DISTRIBUTION SYSTEM RESULTS
PEAK HOUR DEMAND

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

4.5.3 Long Term Water Distribution System

In the Long Term development, the network was evaluated similarly to the Near Future system during ADD, MDD plus Fire, and PHD. The Long Term development water distribution system is shown on Figure 4.6, and the results of the ADD, MDD plus Fire, and PHD are shown on Figures 4.7 - 4.9, respectively. Tables 4.9 and 4.10 summarize the hydraulic analysis results for the pressure assessment (ADD and PHD), and available fire flow assessment (MDD plus Fire), respectively. Detailed simulation results for the Long Term system are provided in Appendix F.

During the Long Term development scenario, as discussed in Section 4.2 the additional Acheson Zone 3 West reservoir will be required so that the RWCG storage capacity requirement is met. In addition, due to the age of the Zone 3 reservoir, it is recommended to utilize the Zone 3 reservoir solely as a truck fill. Therefore, the hydraulic assessment was conducted assuming that the Acheson Zone 3 West reservoir with 12,000 m^3 of storage capacity was constructed in addition to the proposed reservoir expansion at Zone 4 that was completed as part of the Near Future development scenario. At the Acheson Zone 3 West reservoir, a new pumpstation will be required. The new pumphouse was modelled as an infinite source of water to determine how much flow would need to be supplied at the Acheson Zone 3 West reservoir-pumphouse in conjunction with the existing Zone 4 pumphouse when in operation, which is further discussed in Section 4.5.4.

The following pumps were active at each reservoir during the assessment:

- During ADD: Zone 4 is active.
- During MDD + Fire: Both Zone 3 West and Zone 4 are active.
- During PHD: Both Zone 3 West and Zone 4 are active.

Table 4.9: Long Term Development Pressure Assessment

Scenario	Total Number of Nodes	Minimum Pressure	Maximum Pressure	Nodes with High Pressure (>700 kPa)		Nodes with Low Pressure (<350 kPa)	
(-)	(No.)	(kPa)	(kPa)	(No.)	(%)	(No.)	(%)
ADD	513	352	683	0	0	0	0
PHD		350	681	0	0	0	0

During the average day demand scenario, the system was evaluated while the Zone 4 reservoir pumphouse is active. No nodes were determined to be outside the recommended range of 350 kPa to 700 kPa. The minimum pressure located in the system was 352 kPa (51 psi) at nodes J-317 and J-567, and the maximum pressure found in the system was 683 kPa (99 psi) at node J-684.

During the peak hour demand scenario, the system was evaluated while both the Zone 4 and Zone 3 West reservoir pumphouses were active. No nodes were determined to be outside the recommended range of 350 kPa to 700 kPa. The minimum pressure located in the system was 350 kPa (51 psi) at nodes J-317 and J-567, and the maximum pressure found in the system was 681 kPa (99 psi) at node J-684.

Figures 4.7 and 4.9 show the water velocity for the Long Term system during ADD and PHD, respectively. As seen on Figure 4.7, all pipes in the Long Term system are below 0.5 m/s during ADD except for the single 300 mm diameter feed from the Zone 4 reservoir which is reaching up to 0.54 m/s. During Long Term PHD, all pipes are below 0.5 m/s except for the single 300 mm diameter feed from the Zone 4 reservoir which is reaching up to 1.1 m/s, as well as the 350 mm line just east of Zone 3 West Pumphouse-Reservoir. This line reaches 1.1 m/s. The water velocity during average day demand and peak hour demand for the Long Term system is acceptable at below 3.0 m/s.

Table 4.10: Long Term Development MDD Plus Fire Flow Assessment

Residential Nodes	Non-Residential Nodes	Residential Nodes Failing Fire Flow Requirements		Non-Residential Nodes Failing Fire Flow Requirements		Total Nodes Failing Fire Flow Requirements	
(No.)	(No.)	(No.)	(%)	(No.)	(%)	(No.)	(%)
215	298	0	0	2	0.7	2	0.4

As seen in Table 4.10, during the Long Term maximum day demand plus fire flow analysis there are 0 residential nodes and 2 non-residential nodes that fail to meet the fire flow requirements.

- One failing node is at the end of the 300 mm line along 114 Avenue (Node J-582).
- One failing node is located just south of Highway 16A in Zone 6 (Node J-696) at the future soccer centre to be built in the Near Future at 10058 231 Street.

4.5.4 Zone 3 West Pumphouse Sizing

Once the Acheson Zone 3 West reservoir is constructed, the operations philosophy will need to be updated to utilize the reservoirs to appropriately to maintain water turnover within the reservoirs, as well as determine an appropriate pumping capacity for the new reservoir. Due to the age of the Zone 3 reservoir, it is also recommended to utilize the Zone 3 reservoir solely as a truck fill once the new Zone 3 West reservoir is constructed.

To determine the amount of flow supplied by each reservoir during the various demand scenarios, the Zone 4 and Zone 3 West reservoirs were activated shown in Table 4.11 and the resulting flow out of Acheson Zone 3 West reservoir was determined.

Table 4.11: Long Term Pumping Hydraulic Assessment

Demand	Zone 4		Zone 3 West	
(-)	Active?	Flow Out (L/s)	Active?	Flow Out (L/s)
ADD	Yes	87	Yes	37
ADD	No	0	Yes	124
MDD+Fire – North	Yes	345	Yes	133
MDD+Fire – Near Zone 3 West	Yes	220	Yes	258
MDD+Fire – Near Zone 4	Yes	341	Yes	137
MDD+Fire - South	Yes	301	Yes	176
PHD	Yes	260	Yes	112
PHD	No	0	Yes	372

As shown in Table 4.11, flows out of the Zone 3 West reservoir range from a minimum flow of 37 L/s during ADD to a maximum flow during PHD of 372 L/s. During a fire scenario, depending on the operation philosophy of the time, the expected flows out of Zone 3 West would range from approximately 133 L/s to 258 L/s.

The pumphouse proposed at Zone 3 West is recommended to have staged capacities similar to the existing Zone 3 pumphouse, with some smaller capacity pumps to handle the lower flows during normal operation, as well as higher capacity pumps that will activate during an emergency scenario. The pumps should operate to maintain the same hydraulic grade line as the existing reservoirs at 765 m. Based on a ground elevation of 706.2 m, the estimated operating pressure for the Zone 3 West reservoir is 575 kPa.

Therefore, as a preliminary recommendation, the new Zone 3 West pumphouse is proposed to have the following capacities:

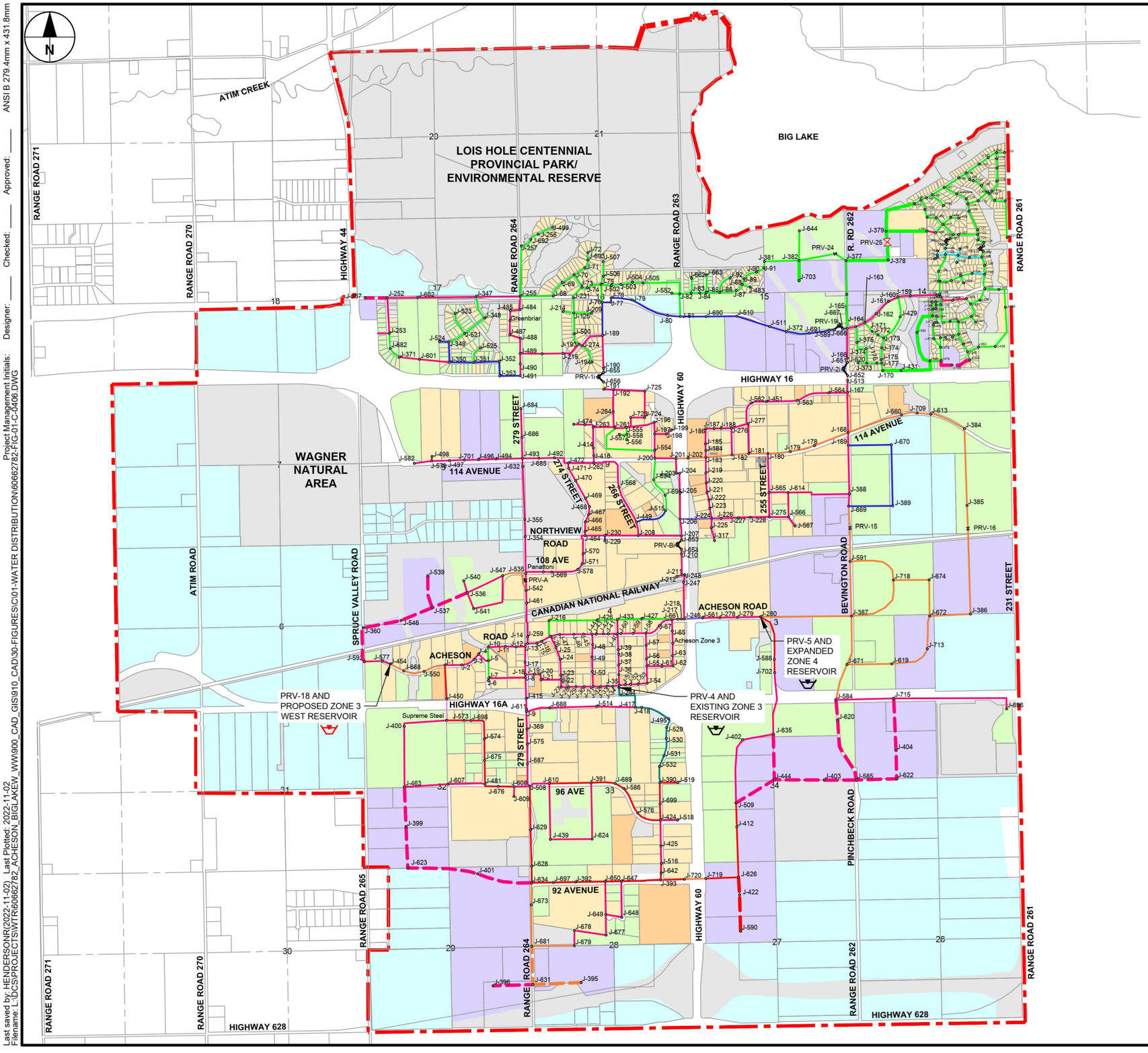
- One 50 L/s variable speed duty pump at 575 kPa (84 psi) and 59 m head.
- Two 75 L/s variable speed duty pumps at 575 kPa (84 psi) and 59 m head.
- Two 150 L/s constant speed pumps at 575 kPa (84 psi) and 59 m head.

4.5.5 Long Term Improvements Summary

To provide water servicing for the Long Term development scenario, the following improvements are recommended:

- System piping to provide water mains to Long Term development areas.
- New PRVs 18 and 25 to maintain pressure boundaries.
- Reconfiguration of the Zone 3 reservoir to function solely as a truck fill.
- The Acheson Zone 3 West reservoir and pumphouse on the west end of Zone 3 located within the Consor development area with a storage capacity of 12,000 m^3, and a total pumping capacity of 500 L/s.

The Acheson Zone 3 West reservoir is triggered when the Average Day Demand reaches 85 L/s. This will occur when approximately 45% (~400 ha) of the Long Term development area has been developed and serviced. The Acheson Zone 3 West reservoir is proposed to be located on the west side of Zone 3 and will have a volume of 12,000 m^3 which has enough capacity to service the Long Term development scenario with the decommissioning of the Zone 3 reservoir. During the design of the reservoir, based on the actual demand increase for ABLA, the sizing of the reservoir should be assessed to whether storage staging should be completed. The total storage capacity for the ABLA water distribution system with the new Zone 3 West reservoir would be 24,861 m^3 plus 4,334 m^3 at Zone 3 for the truck fill. The new pumphouse will be constructed in conjunction with the new reservoir with 500 L/s capacity as detailed in Section 4.5.4.



LEGEND

- STUDY AREA
- SCHEMATIC NODE
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NEAR FUTURE DEVELOPMENT
- LONG TERM DEVELOPMENT
- ULTIMATE DEVELOPMENT
- NOT TO BE SERVICED

PIPE DIAMETERS (See Note)

- 150 mm SCHEMATIC PIPE
- 200 mm SCHEMATIC PIPE
- 250 mm SCHEMATIC PIPE
- 265 mm SCHEMATIC PIPE
- 300 mm SCHEMATIC PIPE
- 322 mm SCHEMATIC PIPE
- 350 mm SCHEMATIC PIPE
- 400 mm SCHEMATIC PIPE
- 410 mm SCHEMATIC PIPE
- 500 mm SCHEMATIC PIPE
- 600 mm SCHEMATIC PIPE
- PROPOSED 200 mm SCHEMATIC PIPE
- PROPOSED 250 mm SCHEMATIC PIPE
- PROPOSED 300 mm SCHEMATIC PIPE
- PROPOSED 350 mm SCHEMATIC PIPE
- PROPOSED 400 mm SCHEMATIC PIPE

NOTE: EXISTING SYSTEM AND NEAR FUTURE PROPOSED UPGRADES ARE ASSUMED TO BE EXISTING BY LONG TERM DEVELOPMENT STAGE.

0 1000 2000 m

1:40000

AECOM

Figure: 4.6

LONG TERM WATER DISTRIBUTION SYSTEM

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

Project Management Initials: ____ Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm
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Project Management Initials: Designer: Checked: Approved: ANSI B 279.4mm x 431.8mm

N

ATIM CREEK

LOIS HOLE CENTENNIAL PROVINCIAL PARK/ ENVIRONMENTAL RESERVE

BIG LAKE

WAGNER NATURAL AREA

RANGE ROAD 271
RANGE ROAD 270
HIGHWAY 44
RANGE ROAD 264
RANGE ROAD 263
RANGE ROAD 262
RANGE ROAD 261
HIGHWAY 16
279 STREET
HIGHWAY 60
114 AVENUE
274 STREET
268 STREET
261 STREET
255 STREET
NORTHVIEW ROAD
ATIM ROAD
SPRUCE VALLEY ROAD
108 AVENUE
CANADIAN NATIONAL RAILWAY
BEVINGTON ROAD
231 STREET
ACHESON ROAD
PRV-5 AND EXPANDED ZONE 4 RESERVOIR
PRV-4 AND EXISTING ZONE 3 RESERVOIR
PRV-18 AND PROPOSED ZONE 3 WEST RESERVOIR
HIGHWAY 16A
96 AVENUE
PINCHBECK ROAD
92 AVENUE
RANGE ROAD 265
HIGHWAY 628

LEGEND

- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR

PRESSURE

- <350 kPa
- 350-700 kPa
- >700 kPa

SCHEMATIC PIPE

- PIPE
- PROPOSED PIPE

PIPE VELOCITY

- <0.5 m/s
- 0.5 - 1.0 m/s
- 1.0 - 2.0 m/s
- 2.0 - 3.0 m/s
- >3.0 m/s

PRESSURE (kPa): 675, 650, 625, 600, 575, 550, 525, 500, 475, 450, 425, 400, 375

0 1000 2000 m

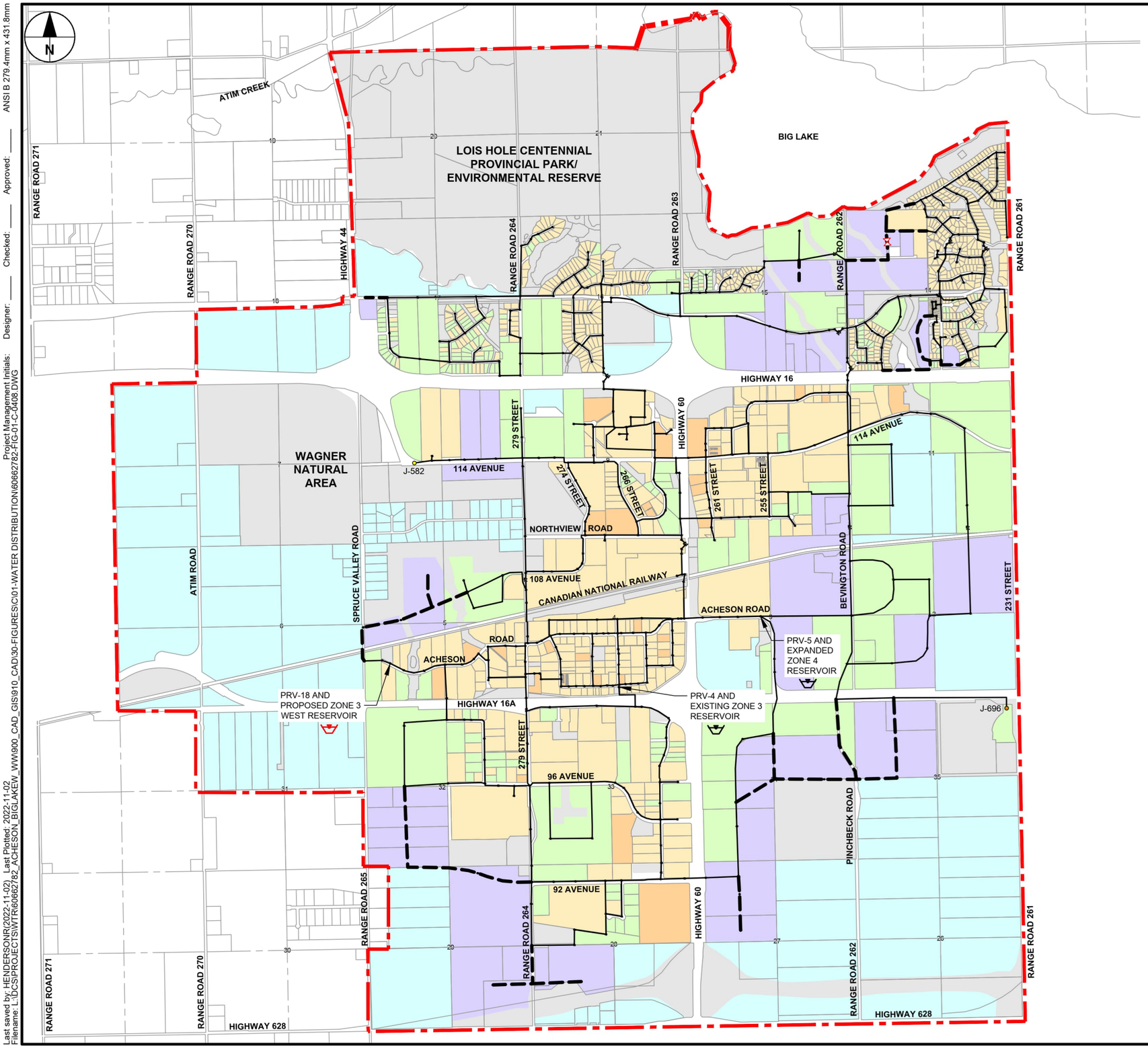
1:40000

AECOM

Figure: 4.7

LONG TERM WATER DISTRIBUTION SYSTEM RESULTS
AVERAGE DAY DEMAND

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022



LEGEND

- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR

SCHEMATIC PIPE

- PIPE
- PROPOSED PIPE

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NEAR FUTURE DEVELOPMENT
- LONG TERM DEVELOPMENT
- ULTIMATE DEVELOPMENT
- NOT TO BE SERVICED

FIRE FLOW

- SCHEMATIC NODES THAT SATISFY FIRE FLOW CONSTRAINTS
- AVAILABLE FIRE FLOW IS 90 - 100% OF REQUIRED FIRE FLOW
- AVAILABLE FIRE FLOW IS 70 - 90% OF REQUIRED FIRE FLOW
- AVAILABLE FIRE FLOW IS < 70% OF REQUIRED FIRE FLOW

0 1000 2000 m

1:40000

AECOM

Figure: 4.8

LONG TERM WATER DISTRIBUTION SYSTEM RESULTS
MAXIMUM DAY DEMAND PLUS FIRE FLOW

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

Project Management Initials: Designer: Checked: Approved: ANSI B 279.4mm x 431.8mm

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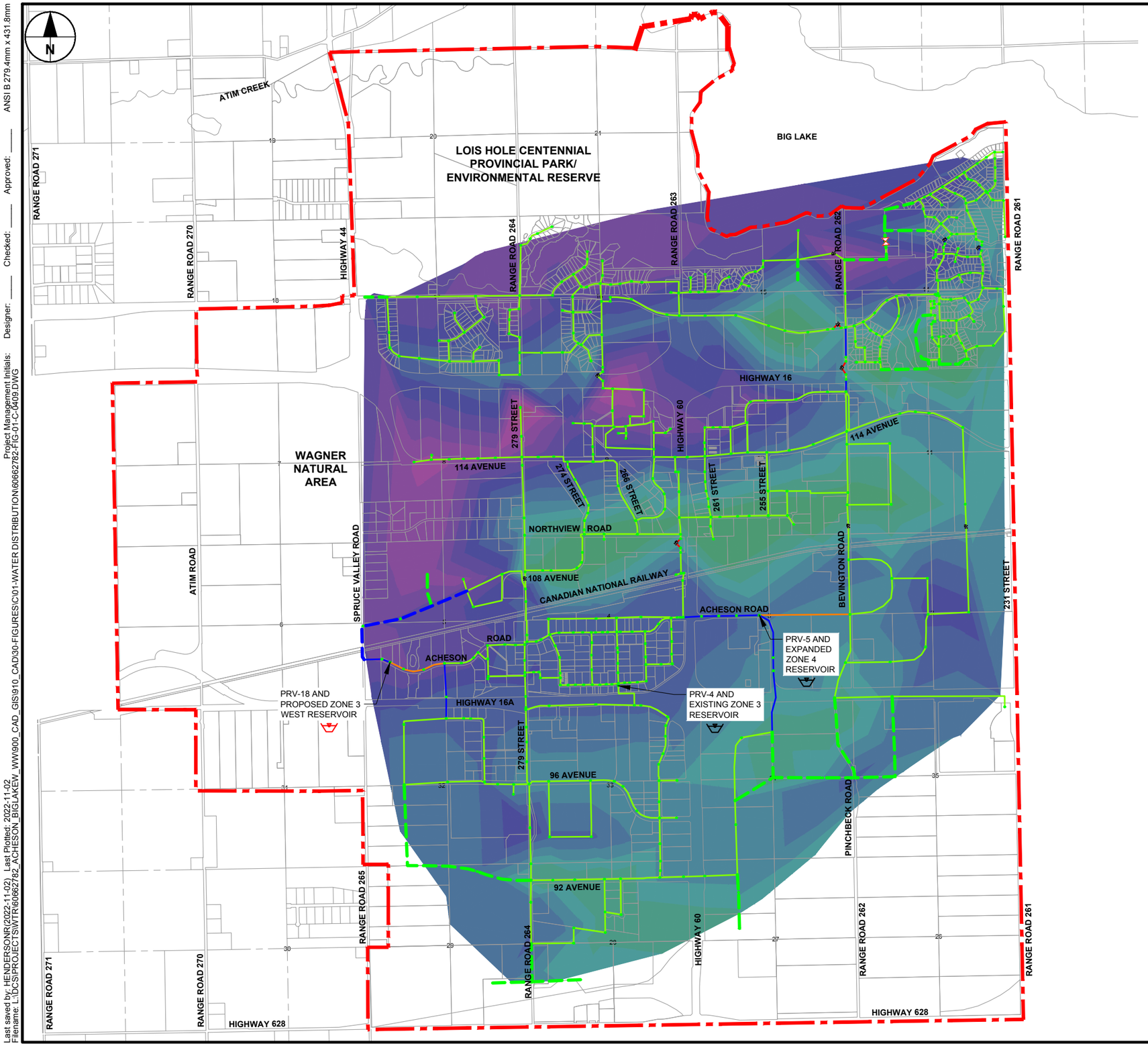


LEGEND

- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR

PRESSURE

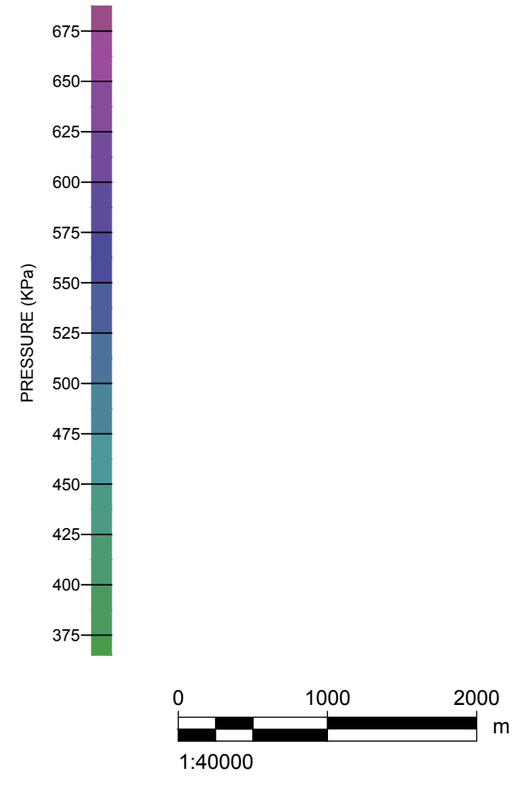
- <350 kPa
- 350-700 kPa
- >700 kPa

SCHEMATIC PIPE

- PIPE
- PROPOSED PIPE

PIPE VELOCITY

- <0.5 m/s
- 0.5 - 1.0 m/s
- 1.0 - 2.0 m/s
- 2.0 - 3.0 m/s
- >3.0 m/s



AECOM

Figure: 4.9

LONG TERM WATER DISTRIBUTION SYSTEM RESULTS
PEAK HOUR DEMAND

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

Project Management Initials: Designer: ____ Checked: ____ Approved: ____ ANSI B 279.4mm x 431.8mm

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4.5.6 Ultimate Water Distribution System

In the Ultimate development, the network was evaluated similarly to the Near Future system during ADD, MDD plus Fire, and PHD. The Ultimate development water distribution system is shown on Figure 4.10, and the results of the ADD, MDD plus Fire, and PHD are shown on Figures 4.11-4.13, respectively. Tables 4.12 and 4.13 summarize the hydraulic analysis results for the pressure assessment (ADD and PHD), and available fire flow assessment (MDD plus Fire), respectively. Detailed simulation results for the Ultimate system are provided in Appendix G.

The following pumps were active at each reservoir during the assessment:

- During ADD: Both Zone 3 West and Zone 4 are active
- During MDD + Fire: Both Zone 3 West and Zone 4 are active
- During PHD: Both Zone 3 West and Zone 4 are active

Table 4.12: Ultimate Development Pressure Assessment

Scenario	Total Number of Nodes	Minimum Pressure	Maximum Pressure	Nodes with High Pressure (>700kPa)		Nodes with Low Pressure (<350 kPa)	
(-)	(No.)	(kPa)	(kPa)	(No.)	(%)	(No.)	(%)
ADD	**559**	352	694	0	0	0	0
PHD		348	688	0	0	3	0.5

During the average day demand scenario, the system was evaluated while pumps at both the Zone 4 reservoir and at Zone 3 West reservoir are active. All nodes were determined to be within the recommended range of 350 kPa to 700 kPa. The minimum pressure located in the system was 352 kPa (51 psi) at nodes J-317 and J-567, and the maximum pressure found in the system was 694 kPa (101 psi) at node J-707.

During the peak hour demand scenario, the system was evaluated while pumps at both the Zone 4 reservoir and at Zone 3 West reservoir are active. A total of 3 nodes were determined to be outside the recommended range of 350 kPa to 700 kPa. Two of the nodes falling outside of the required range are located in the south end of Zone 2 (Nodes J-317 and J-567). The pressure of both these nodes was 348 kPa, within 2 kPa (0.3 psi) of the required value. The other node falling outside of the required range is in Zone 5 along 92 Avenue (Node J-697). The pressure at this node is 349 kPa, within 1 kPa (0.15 psi) of the required value. All three nodes are within 2 kPa (0.3 psi) and would be considered within the accuracy of the model. They are therefore shown as green nodes on Figure 4.13. The minimum pressure located in the system was 348 kPa (50 psi) and the maximum pressure found in the system was 688 kPa (100 psi).

Figures 4.11 and 4.13 show the water velocity for the Ultimate system during ADD and PHD, respectively. The water velocities during average day demand and peak hour demand for the Ultimate system is acceptable at below 3.0 m/s. As seen on Figure 4.11, all pipes in the Ultimate system are below 0.5 m/s during ADD except for the single 300 mm diameter feed from the Zone 4 reservoir which is reaching up to 1.1 m/s. During Ultimate PHD, all pipes are below 0.5 m/s except for the single 300 mm diameter feed from the Zone 4 reservoir which is reaching up to 1.3 m/s, as well as the 350 mm line just east of Zone 3 West Pumphouse-Reservoir which reaches 2.0 m/s.

Table 4.13: Ultimate Development MDD Plus Fire Flow Assessment

Residential Nodes	Non-Residential Nodes	Residential Nodes Failing Fire Flow Requirements		Non-Residential Nodes Failing Fire Flow Requirements		Total Nodes Failing Fire Flow Requirements	
(No.)	(No.)	(No.)	(%)	(No.)	(%)	(No.)	(%)
220	339	0	0	2	0.6	2	0.4

As seen in Table 4.10, during the Ultimate maximum day demand plus fire flow analysis there are 2 non-residential nodes that fail to meet the fire flow requirements.

- One failing node is located just south of Highway 16A in Zone 6 (J-696) at the future soccer centre (10058 231 Street) to be built in the Near Future scenario.
- One failing node is located at the end of the 300 mm line in the Acheson West Area just south of the railway on 100 Avenue (J-617).

4.5.7 Ultimate Development Improvements Summary

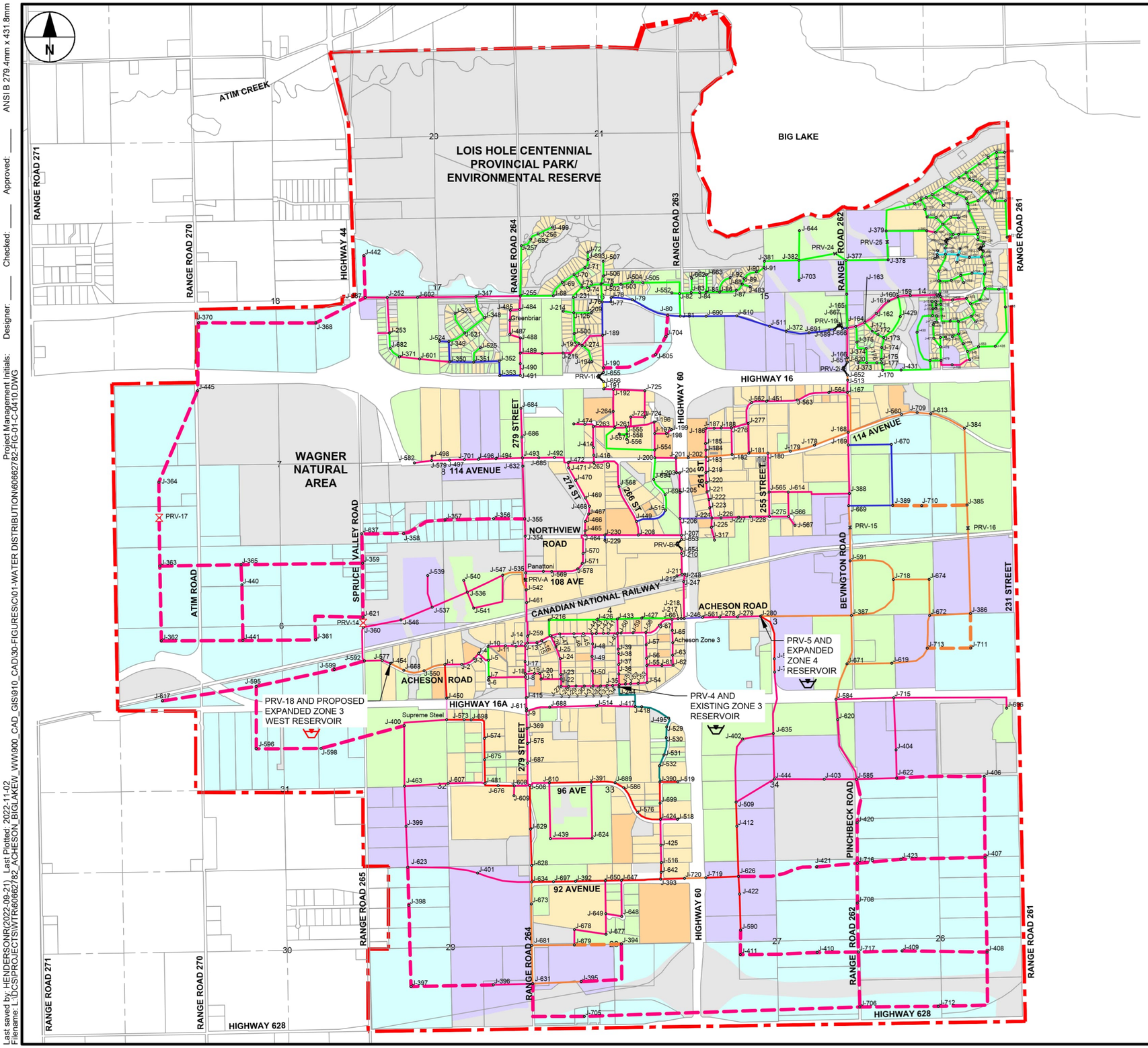
To provide water servicing for the Ultimate development scenario, the following improvements are recommended:

- System piping to provide water mains to Ultimate development areas.
- New PRVs 14 & 17 to maintain pressure zone boundaries.
- A new reservoir and pumphouse with a final storage capacity of 25,000 m^3 and pumping capacity of 500 L/s.

4.6 Comparison to Previous Study - Improvement Summary

Compared to the 2016 Study, some changes have been made to the proposed upgrades and are summarized by the following:

- The 2016 Study recommended an additional crossing at 279 Street and HWY 16 from Zone 1 into Big Lake. This area was studied for both fire flow and pressure, and due to the proposed PRV settings and the recently commissioned Walker Lake to Lakeshore water line, the system is sufficient without this crossing.
- The 2016 Study recommended an East-West crossing at 96 Avenue and HWY 60 another E-W crossing further south. In 2020 the crossing at 92 Avenue and HWY 60 was installed. The second E-W crossing was not included in the proposed upgrades in this Study as the system was sufficient in both fire flow and pressure in the Ultimate development scenario.
- A total of 7 new PRVs are proposed, compared to 8 proposed PRVs in the 2016 Study plus PRV-19 (Walker Lake) which was recently commissioned. The 2016 Study included an additional PRV north of HWY 16 along 279 Street. As discussed above, this crossing is no longer required, and therefore, the PRV is not required.
- Along with updated future water distribution servicing alignments, pipe diameters were also updated in several future development areas. In general, some pipe sizes were decreased. This was achievable because of a few additional mains in zone 6 and 8 that were provided as part of the Ultimate servicing Plan.
- The recommended storage size of the new Zone 3 West reservoir was updated from 8,000 m^3 in the 2016 Study to 12,000 m^3. This was done because of the proposal to utilize the Zone 3 reservoir solely as a truck fill once the new reservoir has been constructed, and the reassigned 4,000 m^3 was added to the new reservoir.



LEGEND

- STUDY AREA
- SCHEMATIC NODE
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR (POTENTIAL RESERVOIR LOCATION)

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NEAR FUTURE DEVELOPMENT
- LONG TERM DEVELOPMENT
- ULTIMATE DEVELOPMENT
- NOT TO BE SERVICED

PIPE DIAMETERS (See Note)

- 150 mm SCHEMATIC PIPE
- 200 mm SCHEMATIC PIPE
- 250 mm SCHEMATIC PIPE
- 265 mm SCHEMATIC PIPE
- 300 mm SCHEMATIC PIPE
- 322 mm SCHEMATIC PIPE
- 350 mm SCHEMATIC PIPE
- 400 mm SCHEMATIC PIPE
- 410 mm SCHEMATIC PIPE
- 500 mm SCHEMATIC PIPE
- 600 mm SCHEMATIC PIPE
- PROPOSED 200 mm SCHEMATIC PIPE
- PROPOSED 250 mm SCHEMATIC PIPE
- PROPOSED 300 mm SCHEMATIC PIPE
- PROPOSED 350 mm SCHEMATIC PIPE
- PROPOSED 400 mm SCHEMATIC PIPE

NOTE: EXISTING, NEAR FUTURE AND LONG TERM PROPOSED UPGRADES ARE ASSUMED TO BE EXISTING BY THE ULTIMATE DEVELOPMENT STAGE.

0 1000 2000 m

1:40000

AECOM

Figure: 4.10

ULTIMATE WATER DISTRIBUTION SYSTEM

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

Project Management Initials: Designer: Checked: Approved: ANSI B 279.4mm x 431.8mm

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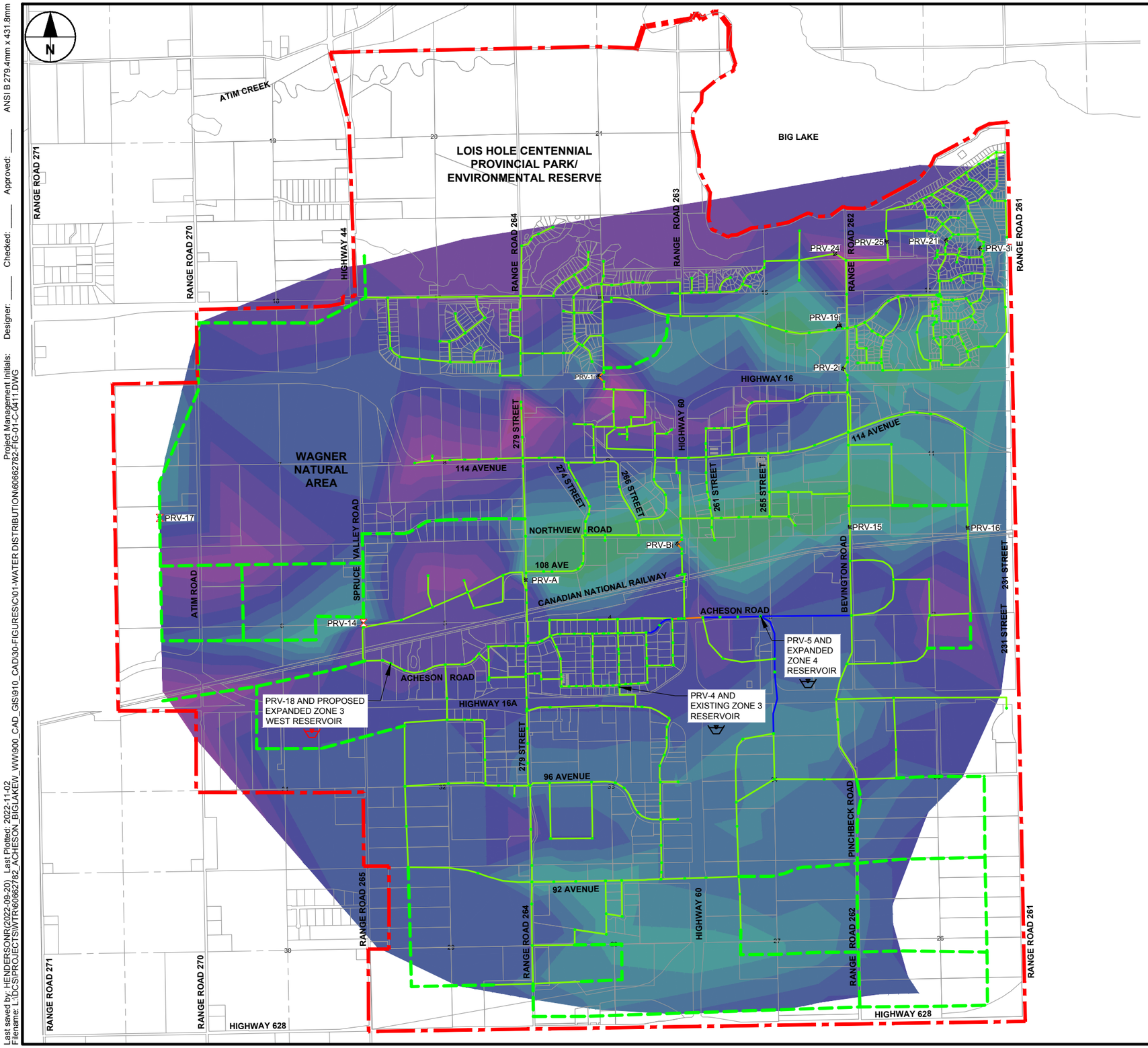


LEGEND

- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR (POTENTIAL RESERVOIR LOCATION)

PRESSURE

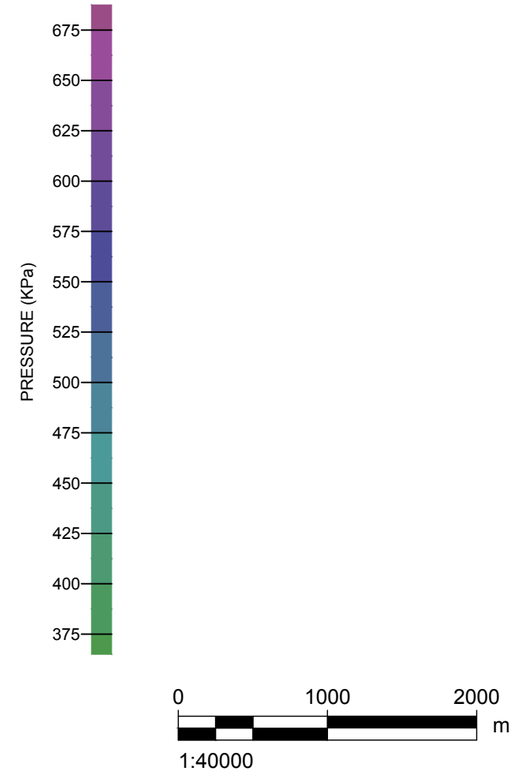
- <350 kPa
- 350-700 kPa
- >700 kPa

SCHEMATIC PIPE

- PIPE
- PROPOSED PIPE

PIPE VELOCITY

- <0.5 m/s
- 0.5 - 1.0 m/s
- 1.0 - 2.0 m/s
- 2.0 - 3.0 m/s
- >3.0 m/s



0 1000 2000 m

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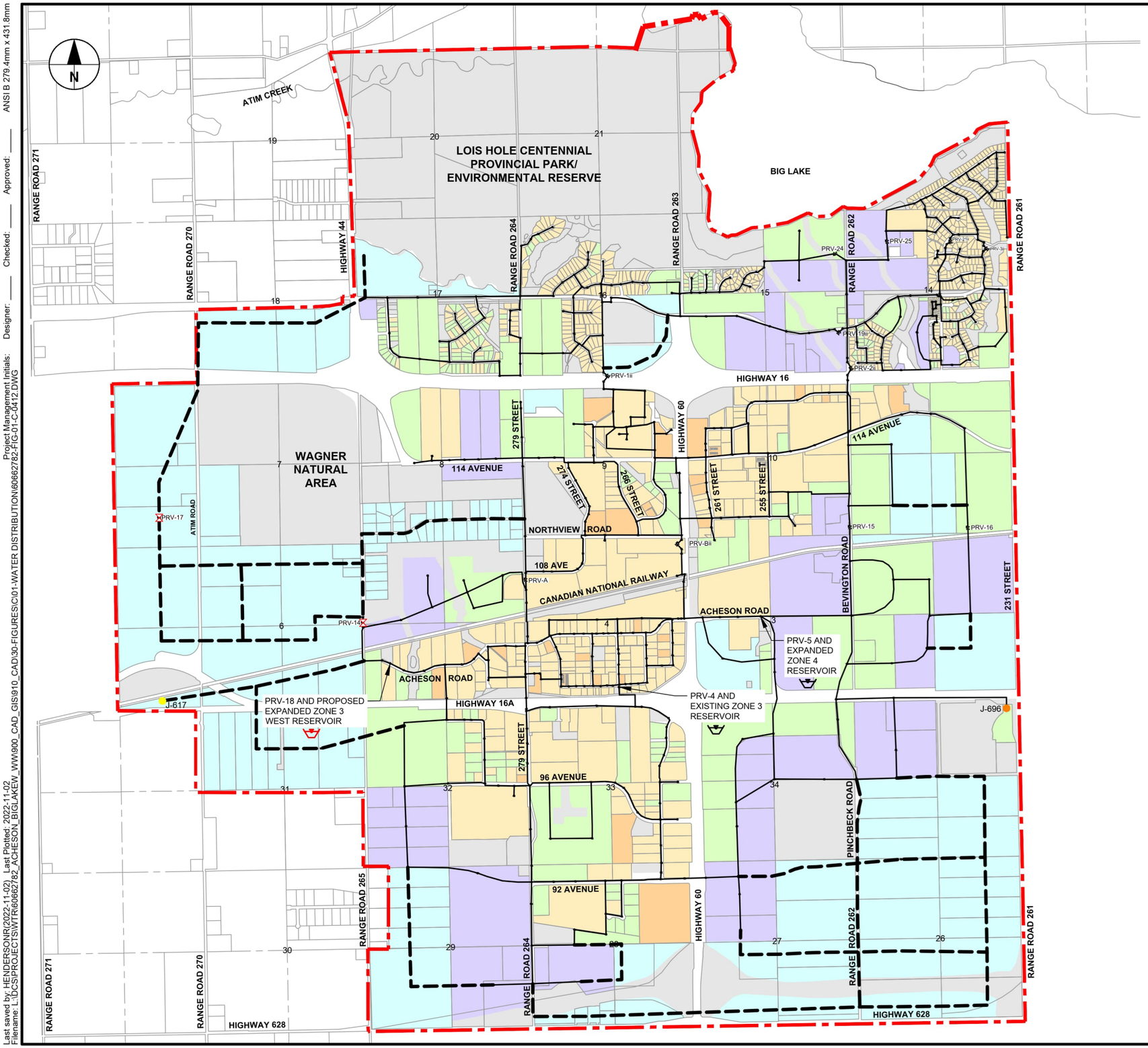
AECOM

Figure: 4.11

ULTIMATE WATER DISTRIBUTION SYSTEM RESULTS
AVERAGE DAY DEMAND

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022



LEGEND

- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR (POTENTIAL RESERVOIR LOCATION)

SCHEMATIC PIPE

- PIPE
- PROPOSED PIPE

DEVELOPMENT STAGING

- EXISTING DEVELOPMENT
- HIGH DEMAND USERS
- NEAR FUTURE DEVELOPMENT
- LONG TERM DEVELOPMENT
- ULTIMATE DEVELOPMENT
- NOT TO BE SERVICED

FIRE FLOW

- SCHEMATIC NODES THAT SATISFY FIRE FLOW CONSTRAINTS
- AVAILABLE FIRE FLOW IS 90 - 100% OF REQUIRED FIRE FLOW
- AVAILABLE FIRE FLOW IS 70 - 90% OF REQUIRED FIRE FLOW
- AVAILABLE FIRE FLOW IS < 70% OF REQUIRED FIRE FLOW

0 1000 2000 m

1:40000

AECOM

Figure: 4.12

ULTIMATE WATER DISTRIBUTION SYSTEM RESULTS
MAXIMUM DAY DEMAND PLUS FIRE FLOW

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

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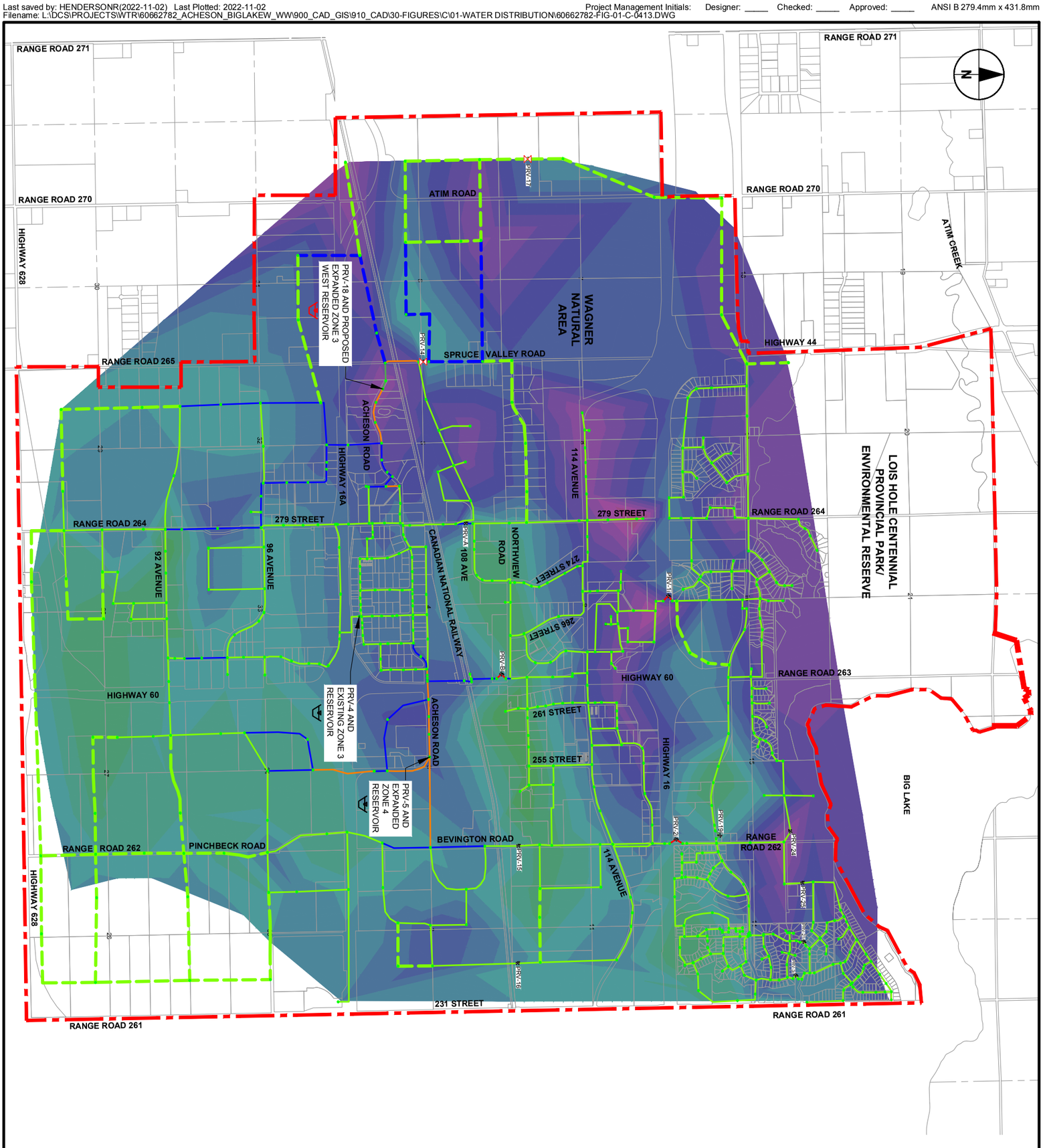

PRESSURE (KPa)

375 400 425 450 475 500 525 550 575 600 625 650 675

0 1000 2000 m

1:40000

LEGEND

- STUDY AREA
- EXISTING PRESSURE REDUCING VALVE (PRV)
- PROPOSED PRESSURE REDUCING VALVE (PRV)
- EXISTING RESERVOIR
- PROPOSED RESERVOIR (POTENTIAL RESERVOIR LOCATION)

PRESSURE

- <350 kPa
- 350-700 kPa
- >700 kPa

SCHEMATIC PIPE

- PIPE
- PROPOSED PIPE

VELOCITY

- <0.5 m/s
- 0.5 - 1.0 m/s
- 1.0 - 2.0 m/s
- 2.0 - 3.0 m/s
- >3.0 m/s

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

ULTIMATE WATER DISTRIBUTION SYSTEM RESULTS
PEAK HOUR DEMAND

AECOM

Figure: 4.13

5. Storage Upgrade Implementation Plan

The following section details the proposed upgrades for the Near Future and Long Term development plans based on the actual water growth recorded in previous years with the water demand projected at a similar rate. This was used to determine the approximate timing of major infrastructure upgrades such as storage and pumping capacity expansions.

As described in Section 3.2 and Table 3.3, in the Acheson Industrial Area, from 2010 to 2021, the actual water demand grew from 14.4 L/s (37,800 m^3/month) to 24.2 L/s (63,550 m^3/month) which equates to a 4.8% annual growth rate. However, the year over year water demand growth varied such that some years the demand dropped by up to 9%, and some years the demand grew by up to 22%. This is due to continual development that occasionally includes a high demand user, such as Champion Foods who used an average of 4.5 L/s (11,800 m^3/month) from March to December 2021, as well as other factors such as unseasonably warm years which occurred in 2021, water restrictions, etc.

When planning for the timing of significant infrastructure upgrades, it is imperative to utilize a growth rate that reflects the system in which it applies. Through discussions with the County, it was determined to utilize a 4% annual growth rate, with an additional high demand user equivalent to Champion Foods every 5 years until the Near Future calculated ADD demand of 73 L/s was reached. From then to the Long Term demand rate, the yearly growth rate was dropped to 2%. From Long Term to Ultimate demand rate, the growth rate remained at 2% but the high demand user was increased to 6 L/s (15,800 m^3/month).

Based on these growth rates the estimated dates that the Near Future, Long Term, and Ultimate projected demands would be reached are as follows:

- Near Future ADD of 73 L/s would be reached in 2042 (in 20 years).
- Long Term ADD of 124 L/s would be reached in 2060 (in 38 years).
- Ultimate ADD of 257 L/s would be reached in 2088 (in 66 years).

Based on these growth rates, the average water demand growth rate through each development stage was as follows:

- The 10 year development horizon: 6.2% average growth.
- The 10 -25 year development horizon: 4.3% average growth.
- The 25 year to Ultimate development horizon: 2.7% average growth.
- The average growth rate from 2022 to Ultimate demand equates to 3.6%.

Therefore, the two major reservoir expansion upgrades will occur as follows:

- The proposed expansion 2 of the Zone 4 reservoir of 4,000 m^3, which has a demand trigger of 62 L/s, which will occur in 2039 (in 17 years).
- The construction of a new reservoir and pumphouse in Zone 3 West of 12,000 m^3, which has a demand trigger of 85.5 L/s, will occur in 2047 (in 25 years). At the time of the construction of the Zone 3 West reservoir, it is recommended to convert the existing Zone 3 reservoir for use solely as a truck fill.

With the above improvements, the total storage capacity within Acheson will be approximately 24,900 m^3. To reach the Ultimate demand storage requirement of 49,600 m^3, additional storage will be required. The location of this storage should be considered once the Zone 3 West reservoir is constructed so that if the reservoir is expanded, design provisions are made allow for expansion.

Table 5.1 summarizes the storage iterations and the demand triggers for expansion to the next phase of storage. For the purposes of this assessment, it was assumed that Zone 3 West could continually be expanded.

The storage expansion trigger and approximate year of expansion was also calculated based on the AEP storage requirement for comparison and sensitivity analysis. For this assessment, the required storage for the truck and barrel fill was assumed equal to the required storage for the distribution system. This assessment has been included as a baseline for storage expansions. It is recommended to follow the CRPWSC requirement.

Table 5.1: Storage Expansion Staging Summary

Reservoir	Pre-Zone 4 Expansion	Existing System (Zone 4 Expansion 2020)	Zone 4 Expansion #2	Zone 3 West Construction	Zone 3 West Expansion 1	Zone 3 Expansion 2
Storage Triggers Based on CRPWSC Requirements						
Zone 3 Storage (m^3)	4,334	4,334	4,334	0*	-	-
Zone 4 Storage (m^3)	3,758	8,861	12,861	12,861	12,861	
Zone 3 West Storage (m^3)	-	-	-	12,000	25,000	38,000
Total Storage (m^3)	8,092	13,195	17,195	24,861	37,861	50,861
ADD Storage Trigger (L/s)	32.5	62	85.1	129.5	204.7	280
Year of ADD Trigger (year)	2026	2039	2047	2062	2079	2092
Storage Triggers Based on AEP Storage Requirements						
AEP ADD Storage Trigger (L/s)	190.7	261.9	398.5	629.9	861.4	1092.9
AEP Year of ADD Trigger (year)	2076	2090	>2100	>2100	>2100	>2100

* Zone 3 converted solely to a truck fill

Appendix H presents the detailed water demand projection as well as the reservoir storage expansion timing calculations.

6. Water Age Analysis

6.1 General

There are many factors that can affect the drinking water quality in a water distribution system; these factors include treated water quality, water age in the system, type of distribution system material, distribution age, etc. Chlorination is one of the methods used for disinfection; it reduces the micro-organisms present in the water. Chloramines are used to provide stable residual in a distribution system, protecting the water supply from potential contamination post treatment. Chloramines decay at a much slower rate than free chlorine but still decay over time due to many of the same reasons as for free chlorine decay. According to standards and guidelines (2006) established by Health Canada, the total chlorine residual required in a distribution system is 0.1 mg/L. To prevent the establishment of a nitrifying biofilm in a chloramine system, total chlorine residual levels should be maintained above 0.5 mg/L.

The chlorine concentration is monitored in the reservoirs. The average, minimum, and maximum chlorine concentrations at the reservoirs in Zones 3 and 4 over a 4-month period (June-October 2021, as recorded by the meters on the distribution headers) are shown in Table 6.1 below. The average concentrations at both the Zone 3 and Zone 4 reservoirs are approximately 1.6 mg/L.

Table 6.1: Zone 3 & 4 Reservoir Chlorine Concentrations

Location	Average Concentration (mg/L)	Minimum Concentration (mg/L)	Maximum Concentration (mg/L)
Zone 3	1.58	1.35	1.75
Zone 4	1.57	1.30*	1.83

**Note: Zone 4 minimum values represent typical operating conditions, Minimum levels recorded during all non-typical infrastructure failure events were excluded.*

Compliance with residual chlorine levels can be assessed by a number of methods; analytical measurement assessment of decay rate and by calculating the water age. A reasonable decay time for chloramines is 14 days (336 hours). Therefore, if the water age is more than 14 days anywhere in the distribution system, the system will need to be flushed out at this point. The model should be validated in order to confirm the chloramines decay rate at identified points, as various factors can impact the decay rate. Validation will allow for more precise calibration, increasing the safety of the water while minimizing flush events and associated costs.

This section describes the development of the model to perform the water quality analysis for the ABLA water distribution network by computing the water age. Note that this assessment was completed for the distribution network only and does not consider the plug flow within the reservoirs.

6.2 Model Development

The ABLA water model was updated to include an extended period simulation (EPS) to utilize the model to determine water age. The existing water distribution system model, with and without upgrades, was utilized to perform the water age analysis. To run the EPS, diurnal flow patterns for both residential and non-residential areas were developed.

The diurnal flow patterns represent the hourly peaks in the water consumption in a typical day. By simulating the continuous flow rates through the distribution system, the model can calculate the time it takes for water to reach each service area. This provides the water age, or the time that the water has been in the distribution system. The diurnal flow curves of residential and non-residential areas are shown on Figure 6.1.

To compute water age in the distribution system, the water leaving the reservoir was set to have an initial age of zero, as the chlorine residuals are metered within the header. The simulated age at each node is then representative of the time the water is within the distribution system. The analysis was run for a long duration (2 week period, i.e., 336 hours), with a hydraulic time step of 1.0 hour.

6.3 Existing System Evaluation

The model results for the water age analysis for the Existing system are shown on Figure 6.2. The simulated water age within the industrial area is generally less than 75 hours, with the exception of a few dead ends. In the residential areas, the simulated water age is generally less than 150 hours (6.25 days) except for dead end nodes, cul-de-sacs, and low demand areas specifically in the west Big Lake Residential Area. A total of 17 out of 423 nodes are red, which represents a water age that exceeds the maximum recommended age of 336 hours. The water age for selected nodes distributed throughout the distribution system is summarized below in Table 6.2.

Table 6.2: Existing System Evaluation: Maximum Water Age at Selected Nodes

Node Number	Maximum Water Age (hours)	Maximum Water Age (days)	Land Use	Zone
J-518	>336	>14	Industrial	5
J-481	76.0	3.2	Industrial	5
J-278	1.5	0.1	Industrial	4
J-49	15.7	0.7	Industrial	3
J-10	34.8	1.5	Industrial	3
J-498	158.1	6.6	Industrial	1
J-469	25.0	1.0	Industrial	1
J-168	66.3	2.8	Industrial	2
J-186	31.3	1.3	Industrial	2
J-485	144.3	6.0	Residential	Big Lake
J-499	246.5	10.3	Residential	Big Lake
J-159	84.2	3.5	Residential	Big Lake
J-346	136.7	5.7	Residential	Big Lake
J-173	120.6	5.0	Residential	Big Lake
J-111	147.6	6.1	Residential	Big Lake
J-97	124.2	5.2	Residential	Big Lake

Note: Maximum water age represents the time the water is within the distribution system

The primary area of water age concern in the west Big Lake Residential Area are the Legends Estates and Spring Meadows Estates subdivisions, which generally have a water age greater than 336 hours. This is due to the current low demand in the area, distance from the reservoirs, and dead ends that exist within the system. It is worth noting that this area is currently supplied by the HWY16 crossing at PRV-1, which then goes north to TWP 532A, through Morningside and Walker Lake Estates, then along a single feed on TWP 532A, and finally to the west to Spring Meadows Estates and Legends Estates.

Stagnant water issues are generally resolved with system looping. In the Near Future development scenarios, with full development of these subdivisions, looping will be completed and the stagnant water issues will be resolved. An additional alternative would be to complete the HWY16 crossing at 279 Street which would create looping for Spring Meadows Estates. However, due to the cost of this highway crossing (including a PRV that would be required), this is not recommended at this time.

Though it is not represented in the model, there is observed stagnation within Zone 5. As noted in Section 3.5.1, when valves are closed during unidirectional flushing program maintenance in Zone 5 along 96th Avenue, it results in very low system pressures. It is recommended that this be investigated to determine a cause.

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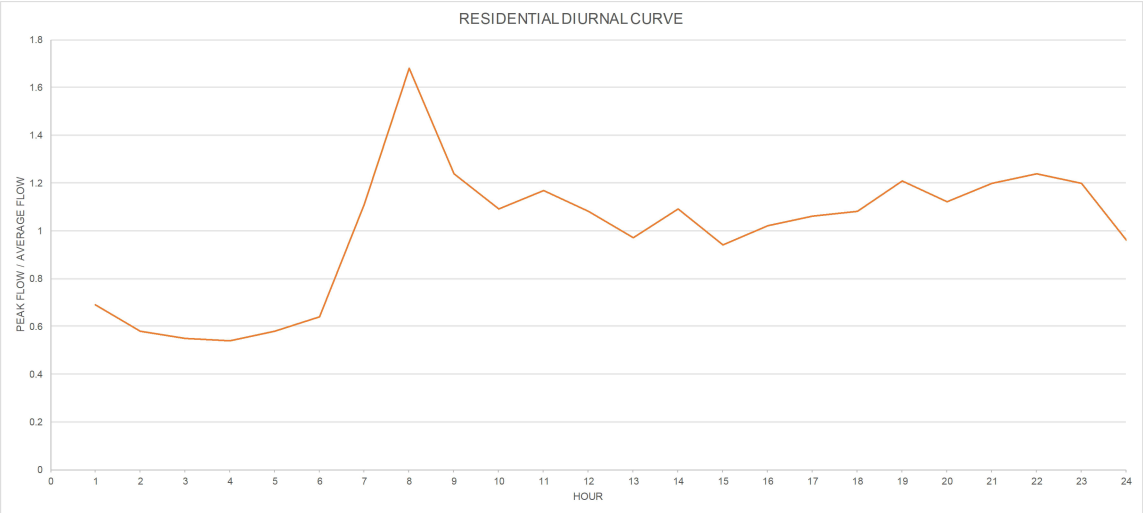

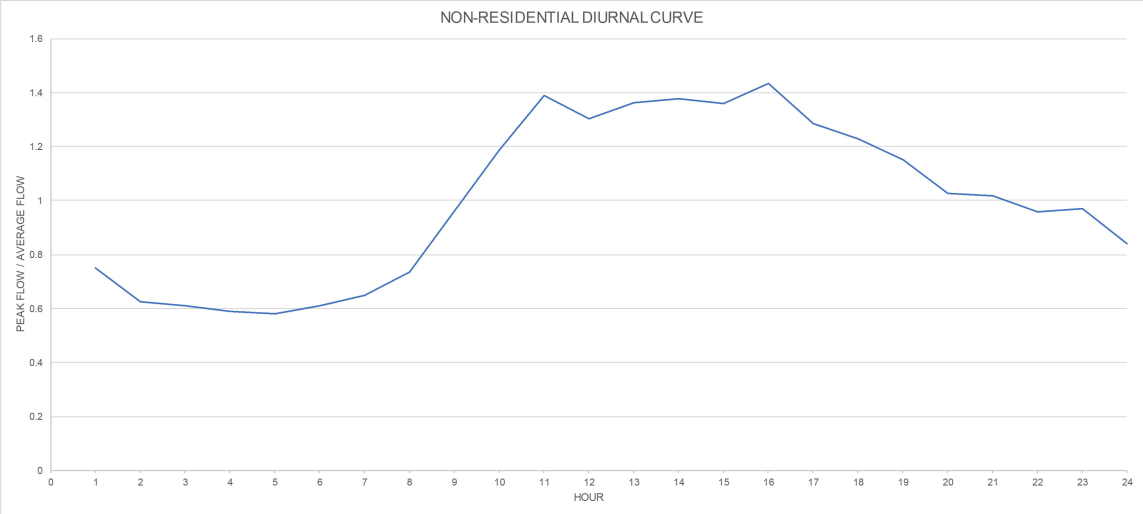

ACHESON AND BIG LAKE AREA WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

DIURNAL FLOW CURVES

AECOM

Figure: 6.1

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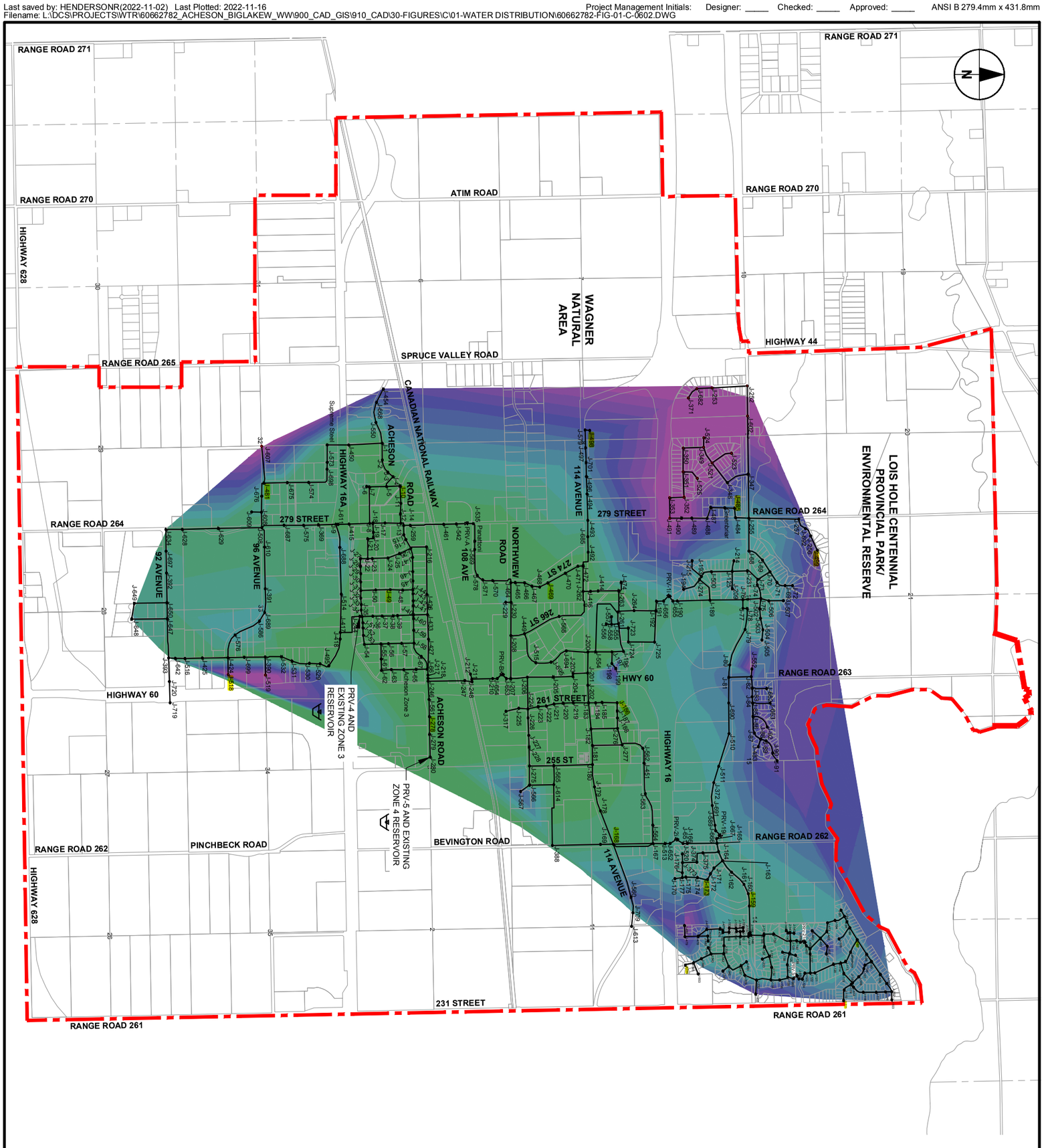

WATER AGE (HOURS)

25 50 75 100 125 150 175 200 225 250 275 300 325

0 1000 2000 m
1:40000

LEGEND

STUDY AREA
EXISTING PRESSURE REDUCING VALVE (PRV)
EXISTING RESERVOIR
EXISTING PIPE

WATER AGE

CALCULATED AGE < 336 HOURS
CALCULATED AGE > 336 HOURS

ACHESON AND BIG LAKE AREA
WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782 Date: November 2022

EXISTING WATER DISTRIBUTION SYSTEM
WATER AGE

AECOM

Figure: 6.2

7. Cost Estimates

7.1.1 Cost Estimates

The following sections detail the costs for improvements for the Near Future, Long Term, and Ultimate development stages. The costs are summarized in Tables 7.1 to 7.5 and are based on 2022 dollars and include a 40% allowance for overhead and engineering and contingency.

7.1.1.1 Storage Reservoirs

As described in Section 4.2, the amount of additional storage required for the Ultimate development condition is approximately 36,400 m^3. Approximately 4,000 m^3 of additional storage can be provided by expanding the Zone 4 reservoir. The estimated cost is approximately $7.3 million, considering a unit rate of $1300/$m^3$ and the 40% allowance for overhead, engineering and contingency. A higher unit rate has been used for this expansion to account for constrained site conditions. A new pumphouse is recommended with this expansion, which is discussed further in Section 7.1.1.2.

In the Long Term development stage, a new reservoir-pumphouse with storage capacity of 12,000 m^3 is proposed to be located at the west end of Zone 3. The Zone 3 West reservoir has an approximate total cost of $11.3 million, considering a unit rate of $650/$m^3$ for storage, and including a 300 m long, 500 mm diameter supply main. The costs include a 40% allowance for overhead, engineering and contingency. This upgrade requires a new pumphouse, which is discussed further in Section 7.1.1.2.

To reach the Ultimate demand storage requirement of 49,600 m^3, 25,000 m^3 of additional storage is required. The location of this storage should be reviewed when the Zone 3 West reservoir is constructed. For the purposes of this report, it has been assumed that the Zone 3 West reservoir will be expanded. The estimated expansion cost is $35 million, considering a unit rate of $1000/$m^3$ and the 40% allowance for overhead, engineering and contingency. It is assumed that the unit cost of the expansion will cost more the initial development due to constraints of working around and connecting to an existing reservoir. This upgrade requires additional pumping, which is discussed further in Section 7.1.1.2.

7.1.1.2 Pumps

In the Near Future, it is recommended to reconstruct the pumphouse at the Zone 4 reservoir to a more flexible design with pumps at varying capacity so that the pumphouse can supply during high and low demand periods. This pumphouse is proposed to have 500 L/s in pumping capacity and will cost approximately $5.5 million.

In the Long Term development scenario, a new reservoir pumphouse is proposed in Zone 3 West. This new pumphouse will be constructed in conjunction with the new reservoir with 500 L/s capacity as detailed in Section 4.5.4 and will cost approximately $6.3 million.

As noted in Section 7.1.1.1, it is assumed that the additional storage required for the Ultimate scenario will be provided through an expansion to the Zone 3 West reservoir. This would require a corresponding expansion of the Zone 3 West pumphouse of approximately 500 L/s. The estimated cost is $3.2 million including contingency. The cost estimates for this expansion assume provisions for expansion at this location are included in the original design.

7.1.1.3 Distribution Mains

The total costs for the proposed water main improvements are summarized in Tables 7.1 through Table 7.3. Table 7.1 details the proposed pipes for areas within the Acheson Industrial Area, Table 7.2 details the proposed pipes which are to be installed via directional drilling under highway and railway crossings, and Table 7.3 details the proposed pipes for the Big Lake residential area.

Table 7.1: Acheson Industrial Water Distribution System Cost Estimates

Diameter	Length (m)	Unit Cost ($)	Total Cost ($)
Near Future			
250	1,477	$450	$664,700
300	10,413	$550	$5,727,200
350	9,701	$600	$5,820,600
400	1,867	$750	$1,265,300
Long Term			
300	7,885	$550	$4,336,800
350	866	$600	$519,600
400	536	$750	$402,000
Ultimate			
300	33,798	$550	$18,588,900
350	1,988	$600	$1,192,800
		SUBTOTAL	$38,517,900
		Contingency (40%)	$15,407,200
		TOTAL	$53,925,100

Table 7.2: Highway and Railway Crossing Water Distribution System Cost Estimates

Diameter	Length (m)	Unit Cost ($)	Total Cost ($)
Near Future			
300	150	$2,000	$300,000
350	350	$2,000	$700,000
Long Term			
300	100	$2,000	$200,000
Ultimate			
300	1,200	$2,000	$2,400,000
		SUBTOTAL	**$3,600,000**
		Contingency (40%)	$1,440,000
		TOTAL	$5,040,000

Table 7.3: Big Lake Residential Water Distribution System Cost Estimates

Diameter	Length (m)	Unit Cost ($)	Total Cost ($)
Near Future			
200	3,662	$400	$1,464,800
300	932	$550	$512,600
Long Term			
200	2,984	$400	$1,193,600
300	568	$550	$312,400
Ultimate			
300	1,388	$550	$763,400
		SUBTOTAL	**$4,246,800**
		Contingency (40%)	**$1,698,700**
		TOTAL	**$5,945,500**

Table 7.4 details a summary of the pipe lengths and total costs required for the Near Future, Long Term, and Ultimate scenarios. A detailed cost breakdown is located in Appendix I.

Table 7.4: Water Distribution System Cost Estimate Summary

Scenario	Length (m)	Cost ($)	Contingency (40%)	Total Cost ($)
Near Future	28,372	$16,456,400	$6,582,400	$23,038,800
Long Term	12,939	$6,964,700	$2,785,700	$9,750,400
Ultimate	38,374	$22,946,800	$9,178,700	$32,125,500
TOTAL	**79,685**	**$46,367,900**	**$18,546,800**	**$64,914,700**

As seen in Table 7.4, the cost for the Near Future, Long Term, and Ultimate development stages are $23.7 million, $9.8 million, and $32.1 million, respectively. The total cost for the ABLA water distribution piping including a 40% contingency is approximately $65.5 million.

7.1.1.4 Pressure Reducing Valves

To operate the system with separate pressure zones, PRV-A is to be replaced with a two-valve configuration in the Existing development stage, three PRVs are required to be installed for the Near Future development stage, two PRVs in the Long Term, and two additional PRVs are required to be installed for the Ultimate development stage. The approximated costs of the PRVs are detailed in Table 7.5.

Table 7.5: Pressure Reducing Valves Cost Estimates

PRV No.	Supplying to Zone	Valve Size (mm)	Total Cost ($)
Existing			
PRV-A (Dual Valve)	1-2	300/100	$300,000
		Subtotal	$300,000
Near Future			
PRV-15	2	350	$350,000
PRV-16	2	350	$350,000
PRV-24	Big Lake West	200	$300,000
		Subtotal	$1,000,000
Long Term			
PRV-18	3	300	$325,000
PRV-25	Big Lake East	200	$300,000
		Subtotal	$625,000
Ultimate			
PRV-14	1	300	$325,000
PRV-17	Big Lake West	300	$325,000
		Subtotal	$650,000
		SUBTOTAL	**$2,575,000**
		Contingency (40%)	**$1,030,000**
		TOTAL	**$3,605,000**

As shown in Table 7.5, the total estimated cost for all eight PRVs is approximately $3.6 million, including 40% contingency.

8. Conclusions and Recommendations

8.1 Existing Water Distribution System

Based on the Existing system analysis, the water distribution system is sufficient to provide system pressures during average day demand and peak hour demand without system improvements. During the Existing system maximum day demand scenario, the water distribution system is sufficient to supply available fire flows throughout the system as seen on Figure 3.6. With the Walker Lake to Lakeshore water line that was commissioned in March 2022, and the new recommended pressure settings shown on Table 3.19, the available fire flow increases such that the fire flow requirements are met.

The existing reservoirs have sufficient capacity (13,195 m^3) to meet the requirements of the existing development, based on both the Alberta Environment and RWCG recommendations. The existing reservoirs have sufficient capacity to service the ABLA, including truck fill and barrel fill, until the total average day demand reaches approximately 62 L/s. The current ADD is 20.7 L/s including truck fille and barrel fill demand.

The existing pumps at the Zone 3 and Zone 4 reservoirs have sufficient capacity to supply the water distribution system during the various demand scenarios.

As noted in Section 3.2, there is approximately 35% in unaccounted for water demand throughout the system. While 5-10% of unaccounted for volume is considered normal for unmetered use, 35% is generally high and it is recommended to investigate for possible causes for this water loss.

As noted in Section 3.5, it is also recommended to replace PRV-A with the two-valve configuration.

8.2 Near Future Water Distribution System

To provide water servicing for the Near Future development, the following distribution system improvements are recommended.

- System piping to provide water mains to Near Future development areas.
- New PRVs 15,16 and 24, to maintain pressure boundaries.

In general, the water distribution system is sufficient to provide adequate pressures and available fire flow during the Near Future development stage.

The 2016 Study recommended an additional crossing at 279 Street and HWY 16 from Zone 1 into Big Lake. This area was studied for both fire flow and pressure. With the proposed PRV settings and the implementation of the Walker Lake to Lakeshore water line, the system is sufficient without this crossing.

The total cost of the proposed pipes required to service the Near Future development is approximately $23.7 million including contingency. It is recommended that proposed pipes be installed by developers on an as needed basis. Three pressure reducing valves are proposed for the Near Future development with a total cost of approximately $1.4 million. The Near Future water distribution system costs are summarized in Table 8.1.

Table 8.1: Near Future Cost Estimate Summary

Item	Upgrade	Cost ($)	Contingency (40%)	Total Cost ($)
Water Distribution Mains	28,372 m (200 mm to 400 mm dia.)	$16,456,400	$6,582,400	$23,038,800
PRVs	3 PRVs (200 mm to 350 mm dia.)	$1,000,000	$400,000	$1,400,000
TOTAL	-	$17,456,400	$6,982,400	$24,438,800

8.3 Long Term Water Distribution System

To provide water servicing for the Long Term development scenario, the following distribution system improvements are recommended:

- System piping to provide water mains to Long Term development areas.
- New PRVs 18 and 25 to maintain pressure boundaries.

In general, the water distribution system is sufficient to provide adequate pressures and available fire flow during the Long Term development stage.

The total cost of the proposed pipes required to service the Long Term development is approximately $9.8 million including contingency. It is recommended that proposed pipes be installed by developers on an as needed basis. Two pressure reducing valves are proposed for the Long Term development with a total cost of approximately $0.9 million. The Long Term water distribution system costs are summarized in Table 8.2.

Table 8.2: Long Term Cost Estimate Summary

Item	Upgrade	Cost ($)	Contingency (40%)	Total Cost ($)
Water Distribution Mains	12,939 m (200 mm to 400 mm dia.)	$6,964,700	$2,785,700	$9,750,400
PRVs	2 PRVs (200 mm to 300 mm dia.)	$625,000	$250,000	$875,000
TOTAL	-	$7,589,700	$3,035,700	$10,625,400

8.4 Ultimate Water Distribution System

To provide water servicing for the Ultimate development scenario, the following distribution system improvements are recommended:

- System piping to provide water mains to Ultimate development areas.
- New PRVs 14 & 17 to maintain pressure zone boundaries.

The existing water distribution system can be expanded as required for future development without additional improvements and can provide adequate pressures and available fire flow.

The total cost of the proposed pipes required to service the Ultimate development is approximately $32.1 million including contingency. It is recommended that proposed pipes be installed by developers on an as needed basis. Two pressure reducing valves are proposed for the Ultimate development with a total cost of approximately $0.9 million. The Ultimate water distribution costs are summarized in Table 8.3.

Table 8.3: Ultimate Cost Estimate Summary

Item	Upgrade	Cost ($)	Contingency (40%)	Total Cost ($)
Water Distribution Mains	33,374 m (300 mm to 400 mm dia.)	$22,946,800	$9,178,700	$32,125,500
PRVs	2 PRVs (300 mm dia.)	$650,000	$260,000	$910,000
TOTAL	-	$23,596,800	$9,438,700	$33,035,500

8.5 Storage and Pumping

Due to demand growth rates and the time it takes for the demand within the development area may to be fully realized, the timing for reservoir upgrades was estimated based on demand trigger rather than by development horizon scenario. The estimated years associated with the trigger demands may change as demands are tracked and projections are updated annually.

Once the average day demand reaches 62 L/s, additional reservoir storage will be required. A 4,000 m^3 reservoir expansion of the Zone 4 reservoir is proposed, along with a new pumphouse to replace the existing pumphouse at the Zone 4 reservoir. The total cost of the Zone 4 reservoir-pumphouse is approximately $12.8 million.

Once the average day demand reaches 85 L/s, additional reservoir storage will be required. A new reservoir-pumphouse is proposed to be located on the west side of Zone 3 and will have a volume of 12,000 m^3 which has enough capacity to service the Long Term development scenario with the decommissioning of the Zone 3 reservoir. During the design of the reservoir, based on the actual demand increase for ABLA, the sizing of the reservoir should be assessed to whether storage staging should be completed. The total storage capacity for the ABLA water distribution system with the new Zone 3 West reservoir would be 24,861 m^3 plus 4,334 m^3 at Zone 3 for the truck fill. The new pumphouse will be constructed in conjunction with the new reservoir with 500 L/s capacity as detailed in Section 4.5.4. The total cost of the Zone 3 West reservoir-pumphouse is approximately $17.6 million.

Once the average day demand reaches 130 L/s, additional reservoir storage will be required. It is assumed this volume will be provided as a 25,000 m^3 expansion to the Zone 3 West reservoir and that design provisions are made to allow for expansion. A corresponding expansion to the pumping of 500 L/s would be required. The total cost of the reservoir-pumphouse is approximately $38.2 million.

The storage and pumping demand triggers and cost estimates are summarized in Table 8.4.

Table 8.4: Storage and Pumping Cost Estimate Summary

Item	Upgrade	Demand Trigger	Estimated Year*	Cost ($)	Contingency (40%)	Total Cost ($)
Reservoir (Zone 4 Expansion #2)	4,000 m^3 Reservoir Expansion	62 L/s	2039	$5,200,000	$2,080,000	$7,280,000
Pumps (Zone 4 New Pumphouse)	435 HP New Pumphouse	62 L/s	2039	$3,915,000	$1,566,000	$5,481,000
Reservoir (Zone 3 West)	12,000 m^3 New Reservoir	85 L/s	2047	$7,800,000	$3,120,000	$10,920,000
Supply Line (Zone 3 West)	500 mm Diameter Main	85 L/s	2047	$255,000	$102,000	$360,000
Pumps (Zone 3 West)	500 HP New Pumphouse	85 L/s	2047	$4,500,000	$1,800,000	$6,300,000
Reservoir (Zone 3 West Expansion)	25,000 m^3 Reservoir Expansion	130 L/s	2062	$25,000,000	$10,000,000	$35,000,000
Pumps (Zone 3 West Expansion)	500 HP Pumphouse Expansion	130 L/s	2062	$2,250,000	$900,000	$3,150,000

**Note: Estimated year of upgrade may change as demands are tracked and projections updated annually.*

The two major storage and pumping upgrades are anticipated to occur on the following timeline:

- The proposed expansion 2 of the Zone 4 reservoir of 4,000 m^3, which has a demand trigger of 62 L/s, which will occur in 2039 (in 17 years).
- The construction of a new reservoir and pumphouse in Zone 3 West of 12,000 m^3, which has a demand trigger of 85.5 L/s, will occur in 2047 (in 25 years). At the time of the construction of the Zone 3 West reservoir, it is recommended to convert the existing Zone 3 reservoir for use solely as a truck fill.

8.6 Water Age Analysis

Water age analysis was carried out to compute the water age in the system for the existing system. In this scenario, the majority of the system met the 14-day maximum standard; however, some dead-end lines and low demand areas did not (see Figure 6.2). Therefore, regular flushing of the system at these locations is recommended.

The primary area of water age concern is the Legends Estates and Spring Meadows Estates. This is due to the current low demand in the area and dead ends that exist within the system. Stagnant water issues are generally resolved with system looping. In the Near Future development scenarios, looping is completed within these neighborhoods and the stagnant water issues will be resolved. An additional alternative would be to complete the highway crossing at 279 Street which would create looping for Spring Meadows Estates. However, due to the cost of this highway crossing (including a PRV that would be required), this is not recommended at this time.

Though not represented in the model, water stagnation has been observed in Zone 5. When valves are closed for uni-directional flushing maintenance, low system pressures are occurring. It is recommended that this be further investigated to determine a cause.

Appendix A

Water Distribution Design Standards Comparison

Table A1: Municipal Design Standards Comparison *Updated May 2022*

		Parkland County	Banff	Canmore	Spruce Grove	Cold Lake	Yellowhead County	Beaumont	Strathcona County	Leduc	Fort Saskatchewan	Devon	Camrose	Legal
Reference														
		Parkland County Engineering Design Standards, June 2015	Town of Banff Engineering Standards	Town of Canmore: Engineering Design and Construction Guidelines, June 2020	City of Spruce Grove Municipal Development Standards, 2015	City of Cold Lake Municipal Engineering Service Standards, 2020	Yellowhead County Design Guidelines and Construction Standards, 2007	Beaumont General Design Standards	Strathcona County Design and Construction Standards, June 2022	The City of Leduc Engineering Design Standards, May 2021	City of Fort Saskatchewan Engineering and Service Standards, November 2013	Town of Devon Design Standards	City of Camrose Development Standards	Town of Legal Minimum Design Standards, 2004
Residential Design Rates														
	Average Day Demand (L/person/day)	350		285		350	375	360	300	250	360	360	454	350
	Maximum Day Demand (L/person/day)	700		570		750	750	720	600	450	720	720	817	630
	Peak Hour Demand (L/person/day)	1,050		1,140		1,500	1,500	1,440	900	750	1,080	1,440	1,362	1,050
	Comments													
Non-Residential Design Rates														
Commercial	Average Day Demand (L/ha/day)			16,000		17,280	17,280	22,500	20,000	22,500				
	Maximum Day Demand (L/ha/day)			32,000				45,000		40,500				
	Peak Hour Demand (L/ha/day)			64,000				90,000		67,500				
	Comments					Peaking Factor Pf = 10*Q*exp(-0.45). Range: 2.5 < Pf < 25	Peaking Factor Pf = 10*Q*exp(-0.45). Range: 2.5 < Pf < 25				Use the residential per capita demands and the following equivalent population factor: 48 people/ha			
Industrial	Average Day Demand (L/ha/day)	6,000				17,280	17,280	22,500	20,000	11,000				
	Maximum Day Demand (L/ha/day)	12,000						45,000		19,800				
	Peak Hour Demand (L/ha/day)	18,000						90,000		33,000				
	Comments										Use the residential per capita demands and the following equivalent population factor: 48 people/ha			
Institutional	Average Day Demand (L/ha/day)					17,280	17,280			11,000				
	Maximum Day Demand (L/ha/day)									19,800				
	Peak Hour Demand (L/ha/day)									33,000				
	Comments					Peaking Factor Pf = 10*Q*exp(-0.45). Range: 2.5 < Pf < 25	Peaking Factor Pf = 10*Q*exp(-0.45). Range: 2.5 < Pf < 25				Use the residential per capita demands and the following equivalent population factor: 48 people/ha			
High Value Property	Average Day Demand (L/ha/day)					17,280	17,280							
	Maximum Day Demand (L/ha/day)													
	Peak Hour Demand (L/ha/day)													
	Comments					Peaking Factor Pf = 10*Q*exp(-0.45). Range: 2.5 < Pf < 25	Peaking Factor Pf = 10*Q*exp(-0.45). Range: 2.5 < Pf < 25							
Fire Flow Requirements														
Single Family Residential	Fire Flow Demand (L/s)	60	83	85		75	100	100	100	115	100	75	61	
	Minimum Residual Pressure (kPa)	150	140	140		140	150	140	140	140	140	150	140	140
	Comments													
Multi-Family Residential	Fire Flow Demand (L/s)	90	150	120			180	180	180	227	133		152	
	Minimum Residual Pressure (kPa)	150	140	140		140	150	140	140	140	140	150	140	140
	Comments	115 L/s for walk-up apartments		200 L/s for medium density properties							Fire flow of apartments is 233 L/s			
Commercial	Fire Flow Demand (L/s)			200			300	270		227	233		190	
	Minimum Residual Pressure (kPa)			140		140	150	140	140	140	140	150	140	140
	Comments													
Industrial	Fire Flow Demand (L/s)	230		200			300			227	183		227	
	Minimum Residual Pressure (kPa)	150		140		140	150	140	140	140	140	150	140	140
	Comments													
Institutional	Fire Flow Demand (L/s)	90		200			300	180		227	183		91	
	Minimum Residual Pressure (kPa)	150		140		140	150	140	140	140	140	150	140	140
	Comments												Schools. City Houses	
High Value Property	Fire Flow Demand (L/s)		300	300	300	300			250					300
	Minimum Residual Pressure (kPa)		140	140	140	140			140					140
	Comments													
Residual Pressure														
	Maximum (kPa)	550	700	620			700	550	700	570	515			
	Minimum (kPa)	350	350	350	280	280	300	350	350		280	300	275	280
	Comments	150 kPa at fire flow hydrant	140 kPa at fire flow hydrant	140 kPa at fire flow hydrant	During Peak Hour Demand	Under maximum day demand plus fire flow							Peak Hour	Peak Hour
Fire Hydrants														
Residential	Maximum Hydrant Spacing (m)	150	90	90	150	140	150	150	150	150	150	150	150	140
	Comments	120 m for multi-family residential and institutional	Low-density residential areas	Low-density residential areas	120 m in multi-family residential areas	90 m in multi-family residential areas	90 m in multi-family residential areas		90 m in multi-family residential areas	90 m in multi-family residential areas	120 m in multi-family residential areas	120 m in multi-family residential areas	120 m in multi-family residential areas	90 m in multi-family residential areas
Non-Residential	Maximum Hydrant Spacing (m)	90	60	60	120	90	100	75	90	90	90	120	90	90
	Comments		Institutional, commercial, industrial and high-density developments	Institutional, commercial, industrial and high-density developments			90 m in school areas							
Pipe Requirements														
Single Family Residential	Minimum Diameter (mm)	200	200	200	200	150	150	200	200		200	200	150	150
	Comments			Except in cul-de-sacs shorter than 150 m, 150mm	Except in cul-de-sacs, 100mm	Unless >= 1 hydrants, then 200 mm			150 mm may be considered for cul-de-sacs without hydrant connections.		150 mm allowance for cul-de-sacs			
Multi-Family Residential	Minimum Diameter (mm)	200	200	200	200	250	150	200	200		200	200	200	150
	Comments								150 mm may be considered for cul-de-sacs without hydrant connections.					
Commercial	Minimum Diameter (mm)		300	250	250	250	200	250	300		250		250	250
	Comments													
Industrial	Minimum Diameter (mm)	300	300	250	250	250	300	250	300		250	300	250	250
	Comments													
Institutional	Minimum Diameter (mm)				250	250								
	Comments													
High Value Property	Minimum Diameter (mm)							300						
	Comments							Along Ring Road						
Velocity														
	Maximum (m/s)					2.5/1.5	2.5/1.5	3	3			2.5/1.5		
	Minimum (m/s)													
	Comments					Max Day + Fire Flow/Peak Hour Flow	Max Day + Fire Flow/Peak Hour Flow					Max Day + Fire Flow/Peak Hour Flow		

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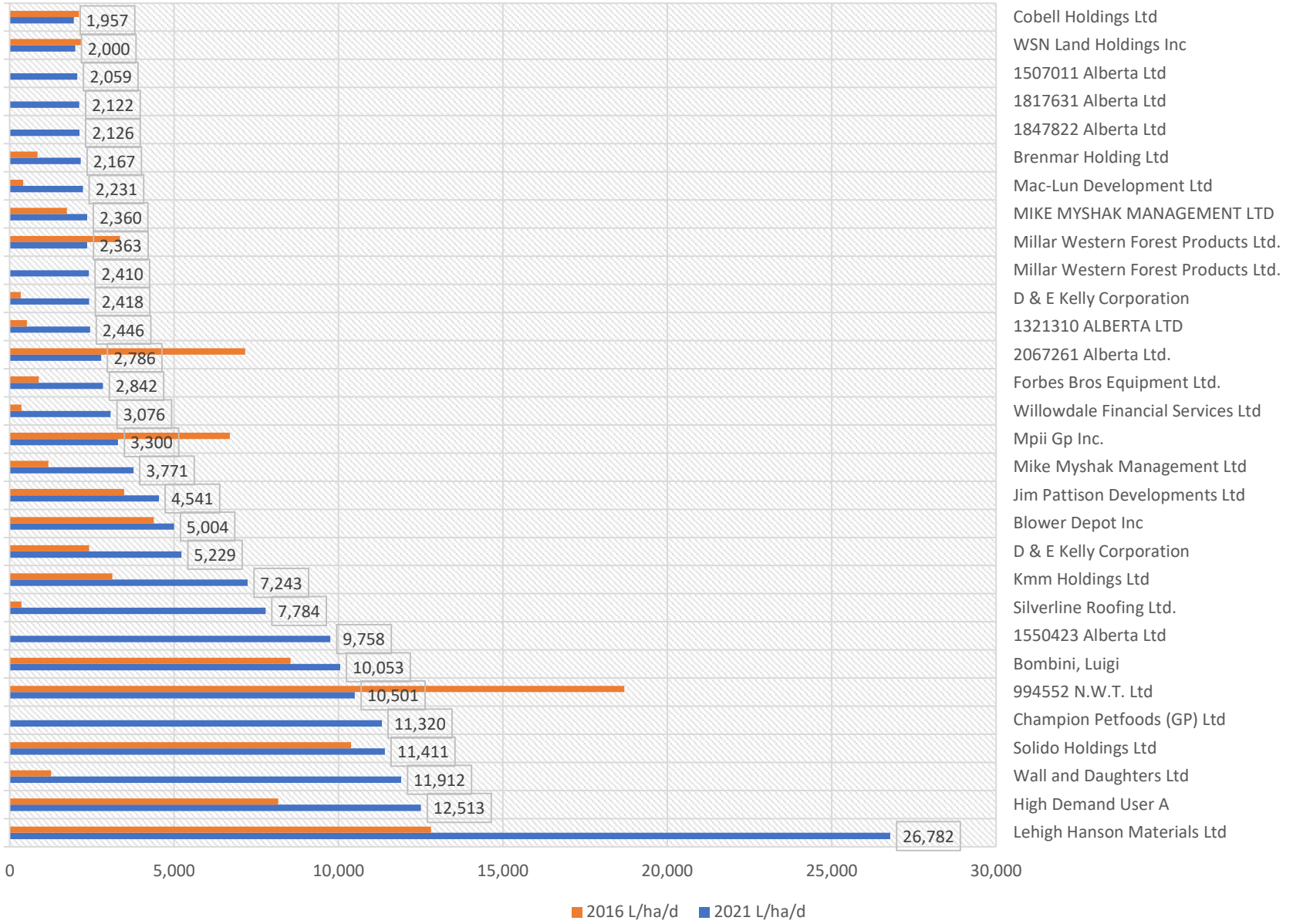
Appendix B

High Demand User Water Consumption

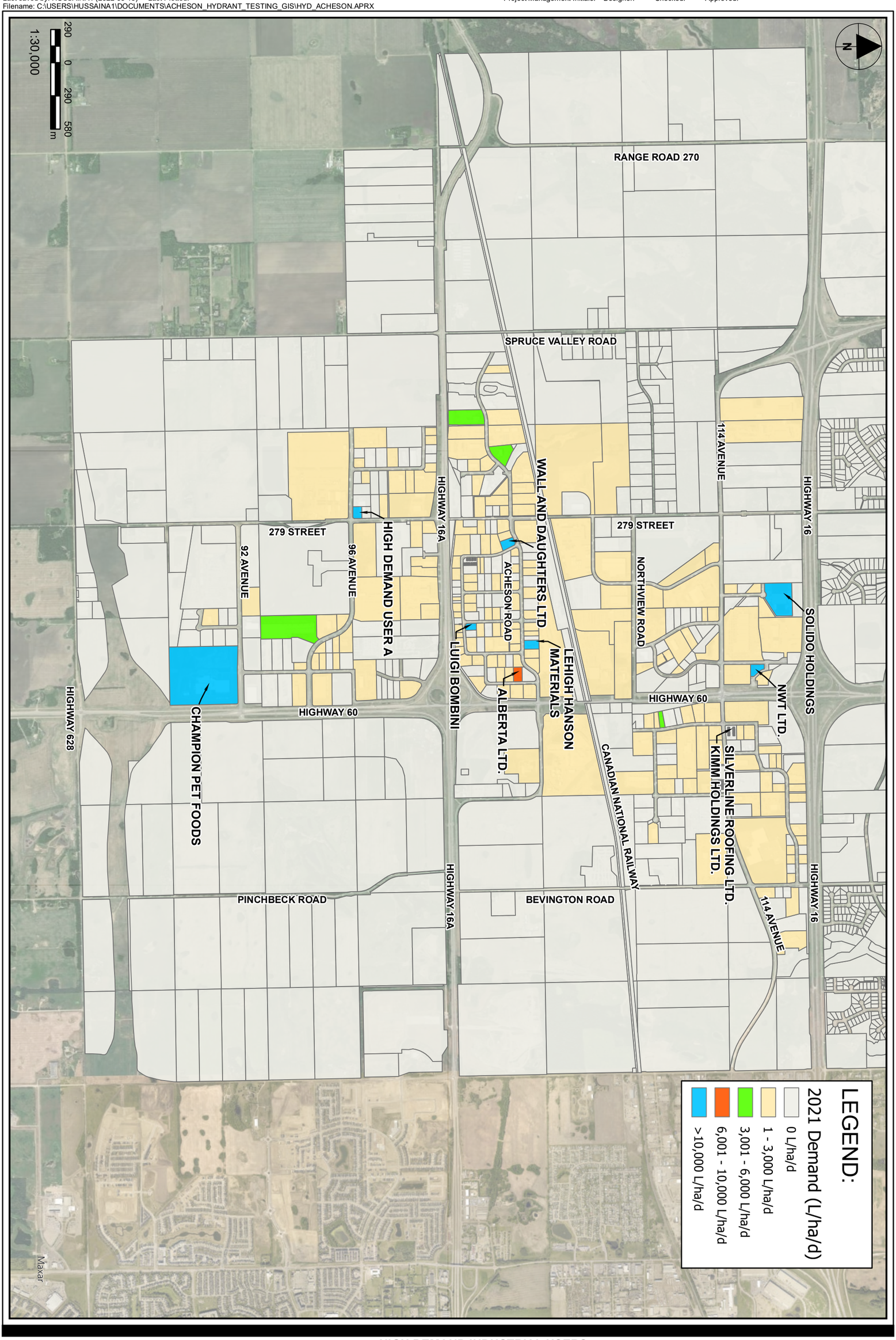
Table B.1: High Demand Industrial Users; Water Consumption Data



ANSI B 279.4mm x 431.8mm

Last saved by: HUSSAINA1 (2022-09-19) Last Plotted:
Filename: C:\USERS\HUSSAINA1\DOCUMENTS\ACHESON_HYDRANT_TESTING_GIS\HYD_ACHESON.APRX

Project Management Initials: Designer: Checked: Approved:



ACHESON AND BIG LAKE AREA WATER SYSTEM STUDY 2022
PARKLAND COUNTY
Project No.: 60662782

HIGH DEMAND INDUSTRIAL USERS

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Figure: B.1

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Appendix C

Existing System Simulation Results

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
185	J-160	584,027.01	5,934,838.88	678.02	0	79.50	734.00
186	J-222	582,145.56	5,932,813.74	700.26	0	64.10	745.39
187	J-162	583,810.38	5,934,670.57	685.00	0	69.60	734.00
188	J-138	584,613.67	5,935,181.42	678.38	0	78.90	734.00
189	J-192	581,191.96	5,933,912.97	677.56	0	96.30	745.39
190	J-119	584,936.53	5,935,869.14	667.10	0	70.70	716.91
191	J-134	584,764.89	5,935,072.26	680.51	0.03	75.90	734.00
192	J-67	581,650.04	5,931,561.40	710.00	0	77.10	764.35
193	J-38	581,243.76	5,931,279.09	710.00	0.01	77.10	764.33
194	J-41	581,141.03	5,931,480.63	710.00	0.01	77.10	764.33
195	J-144	584,396.66	5,935,219.39	675.00	0	83.70	734.00
196	J-37	581,243.76	5,931,168.95	710.00	0	77.10	764.33
197	J-472	580,740.47	5,933,183.14	689.91	0	78.70	745.39
198	J-201	581,815.00	5,933,229.15	690.13	0	78.40	745.39
199	J-91	582,694.12	5,935,128.13	658.00	0	82.60	716.21
200	J-103	585,091.20	5,936,277.99	665.00	0.03	73.70	716.91
201	J-53	581,438.28	5,930,980.15	710.00	0.03	77.10	764.34
202	J-40	581,233.98	5,931,482.32	710.00	0	77.10	764.34
203	J-107	584,778.23	5,935,996.97	664.16	0	74.90	716.91
204	J-212	581,825.45	5,932,053.99	710.00	0	77.10	764.33
205	J-197	581,603.91	5,933,472.82	685.44	0	85.10	745.39
206	J-159	584,150.38	5,934,848.85	679.15	0	77.90	734.00
207	J-163	583,696.80	5,934,580.94	685.00	0	69.60	734.01
208	J-92	582,355.13	5,935,027.71	660.00	0.02	79.80	716.21
209	J-90	582,616.55	5,935,084.61	660.00	0.05	79.80	716.21
210	J-111	585,098.38	5,935,794.30	672.05	0.05	63.70	716.91
211	J-177	583,865.02	5,934,178.46	693.29	0	57.80	734.01
212	J-471	580,745.35	5,933,130.74	690.00	0	78.60	745.39
213	J-233	584,681.75	5,934,979.21	681.75	0.04	74.20	734.00
214	68 (Dum	580,952.95	5,932,747.92	698.59	0.68	66.40	745.39
215	J-1	579,511.27	5,931,168.86	705.00	0.18	84.20	764.33
216	J-174	583,865.88	5,934,330.48	690.60	0.04	61.60	734.01
217	J-236	581,967.14	5,930,803.27	716.05	0	-81.80	658.39
218	J-131	584,433.28	5,934,995.60	679.54	0.04	77.30	734.00
219	J-100	584,835.40	5,936,162.83	665.00	0.05	73.70	716.91
220	J-75	581,067.83	5,934,963.64	655.66	0	86.00	716.21
221	J-60	581,268.02	5,931,483.28	710.00	0	77.10	764.34
222	J-217	581,836.74	5,931,627.98	710.00	0	77.20	764.36
223	J-146	584,443.42	5,934,865.47	686.39	0	67.60	734.00
224	J-6	579,945.01	5,931,013.88	708.42	0.01	79.40	764.33
225	J-169	583,532.49	5,933,358.14	700.00	0	64.40	745.39
226	J-4	579,847.42	5,931,278.15	705.69	0	83.20	764.33
227	J-27	580,669.54	5,930,951.45	710.00	0.03	77.10	764.33
228	J-158	584,415.79	5,934,856.33	685.70	0	68.60	734.00
229	J-14	580,335.90	5,931,383.96	710.00	0	77.10	764.33
230	J-105	584,480.67	5,935,747.97	663.83	0.05	75.40	716.91
231	J-261	581,205.35	5,933,531.77	685.10	0	85.60	745.39

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
232	J-51	581,311.65	5,930,974.43	710.00	0.06	77.10	764.33
233	J-183	582,114.01	5,933,238.15	690.57	0	77.80	745.39
234	J-106	584,742.82	5,936,007.34	663.04	0.03	76.50	716.91
235	J-244	581,247.28	5,930,944.87	712.82	0	73.10	764.33
236	J-185	582,109.89	5,933,372.58	689.49	0.12	79.30	745.39
237	J-205	581,855.89	5,932,883.46	697.62	0	67.80	745.39
238	J-88	582,477.45	5,934,962.82	661.52	0.05	77.60	716.21
239	J-87	582,416.94	5,934,900.96	661.92	0	77.10	716.21
240	J-104	584,294.78	5,935,708.60	663.84	0.05	75.30	716.91
241	J-246	581,897.49	5,931,628.85	710.00	0	77.20	764.37
242	J-232	584,892.94	5,934,920.80	684.28	0	70.60	734.00
243	J-30	580,902.68	5,930,954.31	710.00	0.02	77.10	764.33
244	J-9	580,323.88	5,930,706.90	710.00	0.01	77.10	764.33
245	J-182	582,375.00	5,933,263.31	692.23	0.04	75.40	745.39
246	J-203	581,820.84	5,933,082.06	694.39	0.07	72.40	745.39
247	J-65	581,778.70	5,931,509.37	710.00	0	77.10	764.35
248	J-113	584,707.09	5,935,813.70	666.13	0	72.10	716.91
249	J-126	584,863.23	5,935,234.31	677.59	0.05	80.10	734.00
250	J-243	581,809.90	5,930,681.65	710.62	0	0.00	710.62
251	J-175	583,860.04	5,934,212.11	692.89	0.02	58.40	734.01
252	J-108	584,859.07	5,935,946.29	665.31	0.01	73.20	716.91
253	J-152	584,376.31	5,934,716.20	687.39	0.04	66.20	734.00
254	J-200	581,603.76	5,933,231.65	690.97	0	77.20	745.39
255	J-36	581,245.19	5,931,074.55	710.09	0	77.00	764.33
256	J-143	584,418.36	5,935,234.31	675.12	0	83.60	734.00
257	J-81	581,858.80	5,934,643.74	665.00	0	72.70	716.21
258	J-12	580,220.70	5,931,351.93	710.00	0	77.10	764.33
259	J-226	582,264.78	5,932,630.99	705.95	0.02	56.00	745.39
260	J-45	580,893.42	5,931,477.97	710.00	0.02	77.10	764.33
261	J-17	580,311.95	5,931,197.47	710.00	0	77.10	764.33
262	J-206	581,857.12	5,932,625.05	705.00	0	57.30	745.39
263	J-115	584,825.79	5,935,796.19	666.72	0.02	71.20	716.91
264	J-150	584,403.44	5,934,788.09	687.49	0	66.00	734.00
265	J-77	581,167.95	5,934,784.85	659.73	0	80.20	716.21
266	J-18	580,314.80	5,931,075.86	708.85	0	78.70	764.33
267	J-141	584,418.36	5,935,257.37	675.00	0	83.70	734.00
268	J-8	580,315.10	5,931,044.42	708.00	0.03	80.00	764.33
269	J-241	581,797.28	5,930,801.53	710.62	0	0.00	710.62
270	J-118	585,014.92	5,935,991.35	667.08	0.05	70.70	716.91
271	J-34	581,184.46	5,930,958.60	713.60	0	72.00	764.33
272	J-263	580,990.65	5,933,540.47	686.38	0	83.80	745.39
273	J-135	584,890.35	5,935,064.77	680.00	0.06	76.60	734.00
274	J-121	584,820.49	5,935,506.24	675.00	0.01	59.50	716.91
275	J-181	582,540.59	5,933,275.94	693.31	0.01	73.90	745.39
276	J-264	581,189.28	5,933,693.30	681.63	0.61	90.50	745.39
277	J-220	582,117.40	5,932,983.49	695.93	0.08	70.20	745.39
278	J-252	578,937.82	5,934,828.30	660.00	0.01	79.80	716.21

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
279	J-142	584,423.78	5,935,296.70	675.00	0	83.70	734.00
280	J-109	584,921.74	5,935,884.21	666.76	0.03	71.20	716.91
281	J-129	584,501.09	5,935,261.44	676.15	0.05	82.10	734.00
282	J-39	581,239.51	5,931,322.53	710.00	0	77.10	764.33
283	J-164	583,606.03	5,934,540.88	685.74	0	68.50	734.01
284	J-237	581,962.84	5,930,867.23	716.05	0	-81.80	658.39
285	J-219	582,113.42	5,933,083.07	693.64	0.03	73.50	745.39
286	J-469	580,912.58	5,932,829.94	695.69	0	70.50	745.39
287	J-256	580,441.19	5,935,464.19	655.00	0.03	86.90	716.21
288	J-120	584,734.38	5,935,692.75	670.15	0	66.40	716.91
289	J-230	581,106.83	5,932,460.94	706.93	0	54.60	745.39
290	J-130	584,431.22	5,935,093.29	677.58	0.03	80.10	734.00
291	J-117	585,014.92	5,936,121.64	665.00	0.03	73.70	716.91
292	J-223	582,152.61	5,932,731.90	702.98	0	60.20	745.39
293	J-218	581,867.74	5,931,628.35	710.00	0	77.20	764.36
294	J-46	580,798.60	5,931,476.05	710.00	0	77.10	764.33
295	J-2	579,680.28	5,931,170.16	705.50	0.11	83.50	764.33
296	J-26	580,564.63	5,931,456.51	710.00	0.01	77.10	764.33
297	J-189	581,084.12	5,934,453.39	665.00	0.04	72.70	716.21
298	J-211	581,876.01	5,932,068.33	710.09	0	77.00	764.33
299	J-23	580,668.11	5,931,070.17	710.00	0.01	77.10	764.33
300	J-234	581,967.42	5,930,689.63	716.05	0	-81.80	658.39
301	J-59	581,386.82	5,931,485.18	710.00	0.61	77.10	764.34
302	J-156	584,404.53	5,934,722.07	688.13	0	65.10	734.00
303	J-199	581,769.17	5,933,510.82	685.00	0.01	85.70	745.39
304	J-190	581,093.46	5,934,126.93	673.00	0	61.30	716.21
305	J-148	584,454.98	5,934,760.96	689.42	0.01	63.30	734.00
306	J-132	584,558.06	5,935,001.03	680.87	0.02	75.40	734.00
307	J-19	580,403.49	5,931,080.18	707.98	0	80.00	764.33
308	J-83	581,967.59	5,934,879.14	661.00	0	78.40	716.21
309	J-139	584,644.86	5,935,312.98	676.87	0.03	81.10	734.00
310	J-133	584,653.03	5,935,049.18	680.00	0.02	76.60	734.00
311	J-96	584,368.02	5,935,856.50	660.02	0.03	80.80	716.91
312	J-204	581,850.05	5,933,080.11	694.67	0	72.00	745.39
313	J-52	581,362.87	5,930,976.72	710.00	0	77.10	764.33
314	J-55	581,524.10	5,931,157.51	710.00	0.03	77.10	764.34
315	J-74	580,931.94	5,934,929.32	656.10	0	85.30	716.21
316	J-253	578,957.63	5,934,474.88	660.00	0.01	79.80	716.21
317	J-225	582,168.53	5,932,538.56	707.11	0	54.30	745.39
318	J-186	582,113.31	5,933,524.29	685.00	0	85.70	745.39
319	J-66	581,776.04	5,931,621.09	710.00	0	77.20	764.35
320	J-227	582,440.48	5,932,638.63	706.71	0	54.90	745.39
321	J-54	581,528.40	5,930,990.16	710.00	0	77.10	764.34
322	J-470	580,815.61	5,933,005.16	692.36	0	75.30	745.39
323	J-165	583,521.11	5,934,524.87	687.40	0	66.20	734.01
324	J-32	581,064.31	5,930,954.31	710.00	0.03	77.10	764.33
325	J-42	581,092.22	5,931,480.07	710.00	0.02	77.10	764.33

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
326	J-178	583,196.31	5,933,356.52	696.11	0.06	69.90	745.39
327	J-93	584,191.17	5,935,768.07	660.00	0.05	80.80	716.91
328	J-97	584,487.83	5,935,930.76	660.00	0.03	80.80	716.91
329	J-122	584,821.83	5,935,460.16	675.00	0.02	59.50	716.91
330	J-84	582,052.57	5,934,877.70	660.32	0.01	79.30	716.21
331	J-62	581,787.29	5,931,163.23	710.00	0	77.10	764.35
332	J-29	580,819.72	5,930,954.31	710.00	0.01	77.10	764.33
333	J-94	584,255.00	5,935,803.19	660.00	0	80.80	716.91
334	J-72	580,939.25	5,935,281.52	655.00	0.03	86.90	716.21
335	J-188	582,266.79	5,933,527.86	686.55	0	83.50	745.39
336	J-231	580,791.64	5,934,829.71	658.98	0	81.20	716.21
337	J-229	581,106.36	5,932,407.45	708.32	0.01	52.60	745.39
338	J-466	580,911.13	5,932,595.87	700.92	0	63.10	745.39
339	J-10	579,940.63	5,931,347.65	705.00	0.06	84.20	764.33
340	J-95	584,308.01	5,935,828.08	660.00	0.01	80.80	716.91
341	5 (Dumr	580,618.70	5,931,343.45	710.00	0.68	77.10	764.33
342	J-78	581,169.38	5,934,827.76	658.78	0	81.50	716.21
343	J-99	584,705.73	5,936,073.73	662.40	0.07	77.40	716.91
344	J-210	581,871.46	5,932,276.00	707.00	0.04	81.40	764.32
345	J-7	579,949.27	5,931,039.18	708.18	0	79.70	764.33
346	J-196	581,597.38	5,933,587.35	683.44	0.05	87.90	745.39
347	J-208	581,439.10	5,932,459.61	706.90	0.01	54.60	745.39
348	J-68	580,592.95	5,934,845.60	659.96	0.04	79.80	716.21
349	J-73	580,877.59	5,934,935.04	656.37	0.06	84.90	716.21
350	J-79	581,379.39	5,934,807.01	659.35	0	80.70	716.21
351	J-464	580,909.59	5,932,458.81	705.00	0	57.30	745.39
352	J-221	582,125.37	5,932,889.89	698.69	0	66.30	745.39
353	J-63	581,781.57	5,931,261.93	710.00	0.04	77.10	764.35
354	J-48	580,984.87	5,931,374.92	710.00	0	77.10	764.33
355	J-173	583,884.96	5,934,430.17	688.11	0.06	65.10	734.01
356	J-136	584,891.71	5,935,152.93	679.69	0	77.10	734.00
357	J-255	580,263.72	5,934,844.03	655.00	0.02	86.90	716.21
358	J-137	584,631.30	5,935,458.11	675.00	0.04	59.50	716.91
359	J-44	580,980.30	5,931,477.21	710.00	0	77.10	764.33
360	J-242	581,800.82	5,930,749.77	710.62	0	0.00	710.62
361	J-235	581,964.02	5,930,739.72	716.05	0	-81.80	658.39
362	J-166	583,522.59	5,934,227.90	692.00	0	59.60	734.01
363	J-69	580,683.06	5,934,980.81	657.45	0.04	83.40	716.21
364	J-461	580,324.91	5,931,786.10	709.66	0.03	77.60	764.33
365	J-50	580,982.78	5,931,104.50	710.00	0	77.10	764.33
366	J-58	581,515.23	5,931,487.78	710.00	0.01	77.10	764.34
367	J-61	581,675.72	5,931,158.94	710.00	0.01	77.10	764.34
368	6 (Dumr	581,521.24	5,931,231.89	710.00	0.68	77.10	764.34
369	J-47	580,657.25	5,931,474.23	710.00	0.01	77.10	764.33
370	J-176	583,816.43	5,934,177.51	694.01	0.13	56.80	734.01
371	J-128	584,625.87	5,935,253.30	677.60	0.04	80.10	734.00
372	J-151	584,368.17	5,934,786.73	686.46	0.02	67.50	734.00

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373	J-13	580,314.34	5,931,355.17	710.00	0.01	77.10	764.33
374	J-33	581,129.33	5,930,960.12	711.70	0	74.70	764.33
375	J-238	581,957.36	5,930,928.35	716.05	0	-81.80	658.39
376	J-123	584,823.26	5,935,405.93	675.00	0	59.50	716.91
377	J-191	581,095.77	5,933,917.62	676.40	0	97.90	745.39
378	J-21	580,469.94	5,931,023.06	709.21	0.04	78.20	764.33
379	30 (Dum	582,732.45	5,933,277.32	694.69	0.68	72.00	745.39
380	J-202	581,938.04	5,933,230.80	691.08	0	77.10	745.39
381	J-168	583,530.88	5,933,486.18	696.64	0	69.20	745.39
382	J-49	580,979.92	5,931,250.39	710.00	0.04	77.10	764.33
383	J-110	584,991.94	5,935,799.82	669.94	0.04	66.70	716.91
384	J-102	585,009.28	5,936,277.18	663.86	0.03	75.30	716.91
385	J-31	580,988.50	5,930,955.74	710.00	0	77.10	764.33
386	J-147	584,453.45	5,934,840.49	687.96	0	65.40	734.00
387	J-28	580,746.77	5,930,951.45	710.00	0	77.10	764.33
388	J-24	580,662.38	5,931,227.51	710.00	0	77.10	764.33
389	J-465	580,908.44	5,932,502.26	705.00	0	57.30	745.39
390	J-154	584,411.58	5,934,645.67	688.86	0.03	64.10	734.00
391	J-89	582,495.94	5,935,018.15	660.81	0.02	78.60	716.21
392	J-153	584,372.24	5,934,648.39	687.96	0.03	65.40	734.00
394	J-98	584,633.48	5,936,025.02	660.29	0.03	80.40	716.91
395	J-259	580,335.37	5,931,450.69	710.00	0.12	77.10	764.33
396	J-3	579,802.82	5,931,225.65	706.10	0.09	82.70	764.33
397	J-85	582,115.29	5,934,881.39	660.25	0	79.40	716.21
398	J-71	580,907.63	5,935,126.70	655.00	0.03	86.90	716.21
399	J-116	585,011.03	5,936,214.00	665.00	0.03	73.70	716.91
400	J-167	583,523.26	5,933,883.17	694.49	0	72.20	745.39
401	J-70	580,800.35	5,935,056.62	655.00	0.03	86.90	716.21
402	J-43	581,021.33	5,931,478.00	710.00	0	77.10	764.33
403	J-179	582,955.94	5,933,296.73	695.00	0	71.50	745.39
404	J-265	581,968.79	5,930,637.93	716.05	0	-81.80	658.39
405	J-240	581,785.56	5,930,859.53	710.62	0	0.00	710.62
406	J-224	582,174.13	5,932,629.80	705.00	0.08	57.30	745.39
407	J-35	581,249.48	5,930,968.71	712.31	0	73.80	764.33
408	J-145	584,444.72	5,934,995.00	679.73	0	77.00	734.00
409	J-170	583,875.75	5,934,103.79	694.22	0	56.50	734.01
410	J-228	582,556.63	5,932,642.20	708.46	0.05	52.40	745.39
411	J-15	580,429.24	5,931,386.27	710.00	0.06	77.10	764.33
412	eson Zo	581,783.00	5,931,386.36	710.00	0.08	77.10	764.35
413	J-262	580,997.23	5,933,183.46	691.01	0	77.20	745.39
414	J-76	581,080.70	5,934,784.85	659.39	0	80.70	716.21
415	J-82	581,851.29	5,934,868.21	661.29	0	78.00	716.21
416	J-187	582,195.09	5,933,525.99	685.61	0.02	84.90	745.39
417	J-124	584,883.57	5,935,380.79	675.00	0	59.50	716.91
418	J-86	582,250.40	5,934,884.38	660.62	0.02	78.90	716.21
419	J-101	584,926.98	5,936,225.99	665.00	0.04	73.70	716.91
420	J-140	584,498.38	5,935,323.83	675.17	0.02	83.50	733.99

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421	J-207	581,870.95	5,932,458.53	709.00	0	51.70	745.40
422	J-198	581,719.60	5,933,471.45	685.00	0.22	85.70	745.39
423	J-248	581,903.32	5,932,070.50	710.80	0	76.00	764.33
424	J-247	581,891.92	5,931,996.23	710.54	0	76.40	764.34
425	J-239	581,787.50	5,930,920.44	710.62	0	0.00	710.62
426	J-5	579,945.61	5,931,212.07	706.57	0	82.00	764.33
427	J-171	583,770.32	5,934,494.96	687.57	0.03	65.90	734.01
428	J-22	580,670.19	5,931,024.49	710.00	0.01	77.10	764.33
429	J-16	580,476.44	5,931,406.30	710.00	0	77.10	764.33
430	J-184	582,112.89	5,933,307.91	690.00	0.03	78.60	745.39
431	J-57	581,518.38	5,931,364.91	710.00	0	77.10	764.34
432	J-11	580,115.27	5,931,356.66	710.00	0.07	77.10	764.33
433	J-467	580,945.04	5,932,670.20	698.68	0.12	66.30	745.39
434	J-127	584,738.45	5,935,230.24	678.28	0.03	79.10	734.00
435	J-20	580,457.07	5,931,080.27	710.00	0.01	77.10	764.33
436	J-172	583,827.64	5,934,460.07	688.49	0.03	64.60	734.01
437	J-157	584,429.91	5,934,843.88	686.75	0.01	67.10	734.00
438	J-161	583,932.31	5,934,795.27	682.13	0	73.60	734.00
439	J-114	584,722.31	5,935,766.42	668.89	0	68.20	716.91
440	J-149	584,407.51	5,934,758.25	688.05	0.02	65.20	734.00
441	akeshor	584,613.31	5,935,863.83	662.35	0.05	77.50	716.91
442	J-257	580,273.72	5,935,345.33	655.00	0.01	86.90	716.21
443	J-155	584,414.29	5,934,584.64	689.82	0.02	62.70	734.00
444	0 (Dumr	581,734.36	5,934,653.26	664.25	0.68	73.80	716.21
445	J-125	580,796.41	5,934,677.05	660.00	0.04	79.80	716.21
446	J-193	580,848.07	5,934,368.52	665.00	0.03	72.70	716.21
447	J-194	580,976.24	5,934,190.14	670.34	0.03	65.10	716.21
448	J-209	580,970.10	5,934,678.48	660.00	0.03	79.80	716.21
449	J-214	580,690.97	5,934,694.14	660.00	0	79.80	716.21
450	J-215	580,690.08	5,934,275.57	666.57	0	70.50	716.21
451	J-216	580,551.33	5,931,612.96	710.00	0	77.10	764.33
452	J-274	580,878.67	5,934,350.62	665.00	0	72.70	716.21
453	J-275	582,747.60	5,932,645.50	707.89	0.01	53.20	745.39
454	J-276	582,369.34	5,933,528.13	687.83	0.01	81.70	745.39
455	J-277	582,535.87	5,933,574.49	689.17	0.01	79.80	745.39
456	J-278	582,252.25	5,931,642.45	710.00	0	77.30	764.47
457	79 (Dum	582,429.55	5,931,644.90	712.34	0.68	74.10	764.53
458	J-280	582,657.75	5,931,650.26	715.00	0.21	70.40	764.61
459	J-281	582,714.63	5,931,475.96	713.00	0	87.60	774.75
460	J-317	582,199.34	5,932,409.79	709.00	0	51.70	745.39
461	preme S	579,529.45	5,930,618.12	710.00	0	77.10	764.33
462	J-369	580,329.98	5,930,530.83	711.57	0.02	74.90	764.33
463	J-413	584,962.80	5,935,893.67	667.76	0	69.80	716.91
464	J-414	580,992.55	5,933,333.24	690.00	0.01	78.60	745.39
465	J-415	580,322.26	5,930,836.93	709.65	0	77.60	764.33
466	J-416	580,996.56	5,933,257.52	690.00	0	78.60	745.39
467	J-417	581,409.37	5,930,749.49	710.00	0	77.10	764.33

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
468	J-418	581,473.62	5,930,748.31	710.00	0	77.10	764.33
469	J-426	581,027.60	5,931,617.03	710.00	0	77.10	764.33
470	J-427	581,474.51	5,931,632.42	711.07	0.1	75.60	764.34
471	J-432	582,719.08	5,931,343.62	712.89	0	0.00	712.89
472	J-433	581,230.40	5,931,623.34	710.40	0.01	76.60	764.34
473	J-455	585,032.66	5,934,913.17	682.73	0.01	72.80	734.00
474	J-456	584,578.32	5,935,458.14	674.14	0	60.70	716.91
475	J-457	584,473.57	5,935,561.72	668.91	0.02	68.10	716.91
476	J-458	584,552.88	5,935,630.17	668.40	0.01	68.90	716.91
477	J-459	584,630.33	5,935,622.09	670.00	0	66.60	716.91
478	J-460	584,399.04	5,935,479.51	669.91	0.01	66.70	716.91
479	J-462	584,407.26	5,935,625.71	666.69	0.01	71.30	716.91
480	J-473	584,318.20	5,935,632.34	665.00	0	73.70	716.91
481	J-474	580,907.43	5,933,564.98	687.95	0	81.50	745.39
482	J-475	584,394.68	5,934,582.93	689.24	0	63.50	734.00
483	J-476	584,378.97	5,934,558.28	688.81	0	64.10	734.00
484	J-477	584,385.26	5,934,422.76	691.17	0.04	60.80	734.00
485	J-478	584,452.79	5,934,337.14	695.00	0	55.40	734.00
486	J-479	584,456.37	5,934,203.11	695.00	0	55.40	734.00
487	J-480	584,346.35	5,934,199.50	695.00	0.02	55.40	734.00
488	untry Sq	584,451.06	5,934,432.27	692.57	0	58.80	734.00
489	J-482	584,501.53	5,934,435.28	693.17	0	58.00	734.00
490	J-483	582,554.17	5,934,938.61	661.50	0	77.70	716.21
491	J-484	580,257.71	5,934,709.77	655.00	0	86.90	716.21
492	J-485	580,164.03	5,934,700.83	655.00	0.01	86.90	716.21
493	Greenbria	580,160.09	5,934,602.78	655.28	0.04	86.50	716.21
494	J-487	580,157.19	5,934,461.58	658.62	0.01	81.70	716.21
495	J-488	580,264.39	5,934,426.70	660.00	0	79.80	716.21
496	J-489	580,262.15	5,934,273.16	662.79	0.01	75.80	716.21
497	J-490	580,263.09	5,934,169.52	664.93	0	72.80	716.21
498	J-491	580,263.09	5,934,052.82	668.12	0	68.30	716.21
499	J-492	580,603.96	5,933,233.91	687.77	0.02	81.80	745.39
500	J-493	580,285.22	5,933,229.98	685.12	0	85.60	745.39
501	J-494	580,019.98	5,933,222.44	681.92	0	90.10	745.39
502	J-496	579,846.07	5,933,216.09	683.33	0	88.10	745.39
503	J-497	579,558.48	5,933,207.86	680.78	0.18	91.70	745.39
504	J-498	579,384.04	5,933,248.61	680.76	0	91.70	745.39
505	J-499	580,585.32	5,935,532.59	655.00	0.03	86.90	716.21
506	J-500	580,800.29	5,934,469.04	664.91	0.03	72.80	716.21
507	Panatton	580,493.51	5,932,097.85	705.00	0.14	57.30	745.39
508	J-502	581,171.70	5,934,953.60	655.96	0.02	85.50	716.21
509	J-503	581,266.41	5,934,961.33	656.39	0.03	84.90	716.21
510	J-504	581,381.72	5,934,985.17	655.83	0.03	85.70	716.21
511	J-505	581,484.80	5,934,976.15	656.63	0.04	84.60	716.21
512	J-506	581,091.17	5,935,043.79	655.00	0.03	86.90	716.21
513	J-507	581,089.89	5,935,190.68	655.00	0.03	86.90	716.21
514	J-508	580,357.88	5,929,962.29	715.00	0	70.00	764.33

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
515	J-510	582,422.00	5,934,645.84	668.00	0	68.40	716.21
516	J-511	582,750.31	5,934,542.81	675.00	0	58.50	716.21
517	J-513	583,525.19	5,934,005.24	692.00	0	75.80	745.38
518	J-338	584,547.50	5,934,594.73	690.00	0	62.50	734.00
519	J-339	584,844.68	5,934,804.41	685.00	0.04	69.50	734.00
520	J-340	584,755.52	5,934,642.61	690.00	0.1	62.50	734.00
521	J-341	584,801.75	5,934,584.83	690.00	0	62.50	734.00
522	J-342	584,626.74	5,934,593.08	689.17	0	63.60	734.00
523	J-343	584,630.05	5,934,465.96	690.99	0.06	61.00	734.00
524	J-344	584,677.93	5,934,368.55	692.43	0	59.00	734.00
525	J-345	584,719.20	5,934,290.95	693.49	0.05	57.50	734.00
526	J-346	584,743.41	5,934,208.42	694.61	0	55.90	734.00
527	J-347	579,821.81	5,934,839.28	655.41	0	86.30	716.21
528	J-348	579,906.54	5,934,628.04	660.00	0.09	79.80	716.21
529	J-349	579,552.52	5,934,390.76	660.66	0.03	78.90	716.21
530	J-350	579,560.18	5,934,186.05	665.00	0	72.70	716.21
531	J-351	579,798.46	5,934,185.19	665.00	0	72.70	716.21
532	J-352	580,053.20	5,934,194.89	663.47	0	74.90	716.21
533	J-353	580,058.17	5,934,050.10	666.33	0	70.80	716.21
549	J-371	579,058.45	5,934,237.94	663.97	0	74.10	716.21
550	J-372	582,913.82	5,934,492.65	679.00	0	52.80	716.21
551	J-373	583,715.84	5,934,179.49	692.83	0	58.50	734.01
552	J-374	583,711.11	5,934,323.53	691.08	0	60.90	734.01
553	J-375	583,617.79	5,934,384.39	690.00	0	62.50	734.01
565	J-388	583,543.54	5,932,874.51	705.00	0	57.30	745.39
567	J-390	581,655.30	5,929,996.66	715.00	0.09	70.00	764.33
568	91 (Dum	580,970.38	5,929,997.16	715.00	0.68	70.00	764.33
569	J-392	580,813.36	5,929,007.00	720.00	0.01	62.90	764.33
570	J-393	581,663.98	5,929,028.48	715.00	4.54	70.00	764.32
593	J-424	581,660.97	5,929,623.62	713.50	0.03	72.20	764.33
594	J-425	581,665.24	5,929,366.79	715.00	0	70.00	764.33
602	J-437	584,749.37	5,934,767.29	686.86	0	66.90	734.00
611	J-446	582,629.93	5,931,478.31	713.00	0	87.60	774.75
612	J-447	582,624.18	5,931,342.15	712.89	0	0.00	712.89
614	J-449	581,421.38	5,932,595.83	704.53	0.21	58.00	745.39
615	J-450	579,529.68	5,930,833.39	710.00	0	77.10	764.33
616	J-451	582,718.01	5,933,794.15	686.82	0.08	83.10	745.39
617	J-452	584,568.62	5,934,437.45	692.38	0.07	59.10	734.00
618	J-453	584,709.29	5,934,821.05	685.00	0.06	69.50	734.00
619	J-454	578,967.63	5,931,180.10	705.00	0.09	84.20	764.33
621	J-481	579,912.34	5,929,983.06	710.05	0.12	77.00	764.33
623	J-495	581,742.29	5,930,634.26	710.00	0	77.10	764.33
624	J-514	581,024.45	5,930,758.71	710.00	0.04	77.10	764.33
1202	J-515	581,712.08	5,932,708.51	700.00	0.05	64.40	745.39
1205	J-516	581,669.94	5,929,192.84	715.00	0	70.00	764.32
1210	J-518	581,830.29	5,929,625.08	715.00	0	70.00	764.33
1212	J-519	581,835.07	5,929,999.06	715.66	0	69.10	764.33

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1215	J-520	583,628.60	5,934,178.46	691.55	0	60.30	734.01
1217	J-521	579,709.90	5,934,475.78	661.19	0	78.10	716.21
1221	J-523	579,612.49	5,934,670.51	660.00	0	79.80	716.21
1223	J-524	579,458.36	5,934,392.85	660.00	0	79.80	716.21
1225	J-525	579,864.05	5,934,327.41	663.27	0	75.10	716.21
1247	J-529	581,722.82	5,930,546.21	711.81	0	74.50	764.33
1250	J-530	581,718.67	5,930,439.72	715.00	0	70.00	764.33
1252	J-531	581,695.54	5,930,265.84	715.00	0	70.00	764.33
1254	J-532	581,651.35	5,930,158.96	715.00	0	70.00	764.33
1261	J-535	580,317.76	5,932,082.48	705.00	0	57.30	745.39
1279	J-542	580,321.43	5,931,912.84	706.22	0	82.50	764.33
1303	J-550	579,304.34	5,931,106.29	705.49	0	83.50	764.33
1308	J-552	581,774.56	5,934,875.22	660.36	0.01	79.30	716.21
1310	J-553	584,830.76	5,934,337.70	691.53	0	60.30	734.00
1313	J-554	581,603.99	5,933,308.60	689.95	0	78.70	745.39
1317	J-555	581,321.58	5,933,537.76	685.33	0	85.30	745.39
1320	J-556	581,323.99	5,933,415.23	687.59	0	82.00	745.39
1322	J-557	581,250.04	5,933,467.96	686.55	0	83.50	745.39
1323	J-558	581,327.56	5,933,467.96	686.59	0	83.50	745.39
1330	J-560	584,062.95	5,933,663.17	698.76	0.12	66.20	745.39
1333	J-561	582,080.53	5,931,638.76	710.00	0	77.20	764.41
1336	J-562	582,569.27	5,933,781.52	685.00	0.01	85.70	745.39
1339	J-563	583,023.88	5,933,806.52	689.56	0.27	79.20	745.39
1342	J-564	583,338.73	5,933,881.24	692.98	0	74.40	745.39
1345	J-565	582,744.06	5,932,889.49	701.99	0	61.60	745.39
1348	J-566	582,939.07	5,932,645.59	708.52	0.01	52.30	745.39
1351	J-567	583,002.33	5,932,556.57	709.00	0.01	51.60	745.39
1353	J-568	581,247.75	5,932,942.22	695.05	0	71.50	745.39
1356	J-569	580,577.37	5,932,096.86	705.31	0	56.90	745.39
1359	J-570	580,889.17	5,932,276.53	705.71	0	56.30	745.39
1362	J-571	580,880.65	5,932,177.12	706.82	0	54.80	745.39
1366	J-573	579,703.90	5,930,618.74	710.00	0.05	77.10	764.33
1369	J-574	579,904.79	5,930,431.14	710.00	0	77.10	764.33
1372	J-575	580,334.11	5,930,381.44	712.92	0	73.00	764.33
1375	J-576	581,433.82	5,929,694.07	715.00	0.45	70.00	764.33
1387	J-578	580,835.80	5,932,122.19	707.37	0	54.00	745.39
1390	J-579	579,380.19	5,933,203.20	681.18	0	91.10	745.39
1405	J-586	581,295.24	5,929,939.38	715.00	0.03	70.00	764.33
1415	J-589	583,340.61	5,934,505.28	685.00	0	44.30	716.21
1452	J-602	579,239.65	5,934,831.22	656.38	0	84.90	716.21
1473	J-607	579,543.45	5,929,983.64	715.00	0	70.00	764.33
1475	J-608	580,203.48	5,929,958.96	713.28	0	72.50	764.33
1478	J-609	580,201.01	5,929,860.38	713.35	0	72.40	764.33
1480	J-610	580,552.48	5,929,989.36	715	0.19	70	764.33
1483	J-611	580,325.86	5,930,727.51	710	0	77.1	764.33
1499	J-613	584,353.40	5,933,669.57	695.76	0	70.4	745.39
1504	J-614	582,934.11	5,932,889.06	702.94	0	60.2	745.39

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1556	J-628	580,375.92	5,929,164.92	717.44	0	66.6	764.33
1559	J-629	580,365.57	5,929,526.73	705	0	84.2	764.33
1619	J-634	580,375.70	5,929,000.34	718.77	0	64.7	764.33
1681	J-642	581,668.12	5,929,095.99	715	0	70	764.32
1741	J-647	581,271.30	5,929,015.97	720	0	62.9	764.32
1744	48 (Dum	581,275.92	5,928,657.02	720	0.68	62.9	764.32
1746	J-649	581,116.31	5,928,684.12	720	0	62.9	764.32
1748	J-650	581,110.60	5,929,012.69	721.17	0	61.3	764.32
1793	J-651	583,523.66	5,934,185.31	689	0	63.9	734.01
1796	J-652	583,523.66	5,934,055.72	689	0	80	745.38
1806	J-653	581,870.84	5,932,413.88	706	0	55.9	745.4
1809	J-654	581,870.84	5,932,322.03	706	0	82.8	764.31
1815	J-655	581,092.84	5,934,082.10	670	0	65.6	716.21
1818	J-656	581,094.13	5,933,990.27	670	0	107	745.38
1824	J-657	584,547.43	5,935,420.65	670.5	0	65.9	716.92
1827	J-658	584,513.37	5,935,361.62	670.5	0	90.1	733.99
1833	J-659	584,881.21	5,935,345.23	676.7	0	57.1	716.91
1836	J-660	584,877.83	5,935,291.99	676.7	0	81.3	734
1857	J-662	581,970.85	5,935,022.33	659.84	0	80	716.21
1859	J-663	582,116.21	5,935,056.50	657.14	0	83.9	716.21
1882	J-666	583,396.00	5,934,512.06	685	0	44.3	716.21
1885	J-667	583,475.57	5,934,520.36	685	0	69.6	734.01
1930	J-668	579,102.84	5,931,112.30	705.76	0	83.1	764.33
1949	J-675	579,907.29	5,930,219.27	710	0	77.1	764.33
1952	J-676	580,043.39	5,929,961.76	711.5	0	75	764.33
1965	J-682	578,966.18	5,934,323.21	662.52	0	76.2	716.21
1974	J-685	580,448.50	5,933,230.44	686.51	0	83.6	745.39
1980	J-687	580,334.63	5,930,185.02	714.34	0	71	764.33
1983	J-688	580,557.45	5,930,744.75	710	0	77.1	764.33
1986	J-689	581,209.13	5,929,990.60	715	0	70	764.33
1989	J-690	582,115.87	5,934,642.64	665.83	0	71.5	716.21
1992	J-691	583,142.38	5,934,477.03	682.21	0	48.3	716.21
1995	J-692	580,367.90	5,935,411.75	655	0	86.9	716.21
1998	J-693	580,939.14	5,935,207.44	655	0	86.9	716.21
2001	J-694	581,593.23	5,933,015.33	699.23	0	65.5	745.39
2004	J-695	581,706.64	5,932,861.89	698.36	0	66.8	745.39
2009	J-697	580,594.61	5,929,003.29	722.94	0	58.8	764.33
2012	J-698	579,772.86	5,930,616.65	710	0	77.1	764.33
2015	J-699	581,656.96	5,929,786.31	715	0	70	764.33
2024	J-701	579,705.90	5,933,212.88	682	0	90	745.39
2048	J-709	584,218.05	5,933,682.14	696.07	0	70	745.39
2142	J-719	582,112.92	5,929,042.77	714.67	0	70.5	764.32
2145	J-720	581,900.54	5,929,036.19	714.83	0	70.3	764.32
2148	J-721	585,115.48	5,935,430.98	672.05	0	63.7	716.91
2153	J-723	581,364.59	5,933,637.12	683.4	0	88	745.39
2155	J-724	581,503.77	5,933,636.39	683.4	0	88	745.39
2157	J-725	581,505.07	5,933,898.96	680	0	92.8	745.39

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
185	J-160	TRUE	60	175.79	60	175.79	45.9	21.8	J-480
186	J-222	TRUE	230	309.19	230	309.19	28	21.8	J-317
187	J-162	TRUE	60	197.99	60	197.99	36	21.8	J-480
188	J-138	TRUE	60	87.4	60	87.4	21.8	35.5	J-346
189	J-192	TRUE	230	350	230	350	31	22.7	J-567
190	J-119	TRUE	60	107.22	60	107.22	28.8	21.8	J-111
191	J-134	TRUE	60	122.19	60.05	122.23	23.3	21.8	J-346
192	J-67	TRUE	230	350	230.01	350.01	59.1	50.1	J-372
193	J-38	TRUE	230	350	230.01	350.01	57.5	49.6	J-697
194	J-41	TRUE	230	350	230.02	350.02	59.2	49.5	J-697
195	J-144	TRUE	60	85.11	60	85.11	21.8	27.6	J-143
196	J-37	TRUE	230	350	230.01	350.01	58.2	49.5	J-697
197	J-472	TRUE	230	350	230	350	34.2	27.7	J-229
198	J-201	TRUE	230	321.68	230	321.68	46.2	21.8	J-567
199	J-91	TRUE	60	66.69	60	66.69	21.8	22.3	J-90
200	J-103	TRUE	60	102.82	60.05	102.88	21.8	28.2	J-111
201	J-53	TRUE	230	350	230.05	350.05	58.8	50.1	J-372
202	J-40	TRUE	230	350	230	350	62.5	50.1	J-372
203	J-107	TRUE	60	109.7	60	109.7	29.2	21.8	J-111
204	J-212	TRUE	230	310.61	230	310.61	21.8	26.2	J-211
205	J-197	TRUE	230	344.43	230	344.43	37.5	21.8	J-567
206	J-159	TRUE	60	164.31	60	164.31	44.3	21.8	J-480
207	J-163	TRUE	60	210.16	60	210.16	36	21.8	J-480
208	J-92	TRUE	60	74.56	60.04	74.6	21.8	27.7	J-87
209	J-90	TRUE	60	67.07	60.08	67.16	21.8	24.6	J-91
210	J-111	TRUE	60	93.71	60.08	93.79	21.8	21.8	J-721
211	J-177	TRUE	60	139.29	60	139.29	23.1	21.8	J-170
212	J-471	TRUE	230	350	230	350	33.7	27.7	J-229
213	J-233	TRUE	60	114.5	60.06	114.56	21.8	25.6	J-346
214	58 (Dum	TRUE	230	350	231.13	351.13	26	27.1	J-229
215	J-1	TRUE	230	350	230.3	350.3	45.7	41.5	J-450
216	J-174	TRUE	60	156.74	60.06	156.8	22	21.8	J-170
218	J-131	TRUE	60	126	60.06	126.06	34.2	21.8	J-346
219	J-100	TRUE	60	109.85	60.09	109.94	23.7	21.8	J-111
220	J-75	TRUE	60	199.29	60	199.29	33.1	21.8	J-372
221	J-60	TRUE	230	350	230	350	61.5	50.1	J-372
222	J-217	TRUE	230	350	230	350	60.1	50.1	J-372
223	J-146	TRUE	60	133.04	60	133.04	31.4	21.8	J-346
224	J-6	TRUE	230	349.11	230.01	349.12	21.8	41.9	J-7
225	J-169	TRUE	230	285.14	230	285.14	24.4	21.8	J-388
226	J-4	TRUE	230	350	230	350	45.8	43.7	J-697
227	J-27	TRUE	230	350	230.04	350.04	54	47.5	J-697
228	J-158	TRUE	60	145.48	60	145.48	35	21.8	J-480
229	J-14	TRUE	230	350	230	350	52.5	46.4	J-697
230	J-105	TRUE	60	109.69	60.08	109.77	21.8	26.8	J-346
231	J-261	TRUE	230	350	230	350	36.4	22.9	J-567
232	J-51	TRUE	230	350	230.11	350.11	63	49.7	J-697
233	J-183	TRUE	230	308.2	230	308.2	46.5	21.8	J-567
234	J-106	TRUE	60	109.99	60.04	110.03	30.8	21.8	J-111
235	J-244	TRUE	230	350	230	350	63.3	48.9	J-697
236	J-185	TRUE	230	306.66	230.19	306.85	43.1	21.8	J-567
237	J-205	TRUE	230	329.79	230	329.79	30	21.8	J-567
238	J-88	TRUE	60	70.98	60.08	71.06	21.8	21.8	J-483
239	J-87	TRUE	60	73.37	60	73.37	21.8	22.3	J-88
240	J-104	TRUE	60	121.43	60.08	121.5	25.8	21.8	J-346
241	J-246	TRUE	230	350	230	350	58.7	50.1	J-372
242	J-232	TRUE	60	111.12	60	111.12	25.4	21.8	J-346

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
243	J-30	TRUE	230	350	230.03	350.03	55.8	48.1	J-697
244	J-9	TRUE	230	350	230.02	350.02	54.2	44.6	J-697
245	J-182	TRUE	230	300.7	230.06	300.76	43.2	21.8	J-567
246	J-203	TRUE	230	325.71	230.12	325.83	36	21.8	J-567
247	J-65	TRUE	230	350	230	350	56.4	50.1	J-372
248	J-113	TRUE	60	116.17	60	116.17	27.5	21.8	J-111
249	J-126	TRUE	60	116.93	60.08	117.01	25.7	21.8	J-346
251	J-175	TRUE	60	142.79	60.03	142.82	22.4	21.8	J-170
252	J-108	TRUE	60	109.25	60.02	109.27	28.3	21.8	J-111
253	J-152	TRUE	60	104.18	60.07	104.24	32.6	21.8	J-480
254	J-200	TRUE	230	335.93	230	335.93	39.1	21.8	J-567
255	J-36	TRUE	230	350	230	350	60.6	49.4	J-697
256	J-143	TRUE	60	90.22	60	90.22	21.8	21.9	J-144
257	J-81	TRUE	60	93.36	60	93.36	41.6	21.8	J-372
258	J-12	TRUE	230	350	230	350	48.3	46	J-697
259	J-226	TRUE	230	300.29	230.03	300.32	23.3	21.8	J-228
260	J-45	TRUE	230	350	230.03	350.03	55.4	48.4	J-697
261	J-17	TRUE	230	350	230	350	52.6	45.9	J-697
262	J-206	TRUE	230	331.8	230	331.8	26.9	21.8	J-317
263	J-115	TRUE	60	112.03	60.03	112.05	28	21.8	J-111
264	J-150	TRUE	60	107.35	60	107.35	31.5	21.8	J-480
265	J-77	TRUE	60	161.06	60	161.06	49.1	21.8	J-372
266	J-18	TRUE	230	350	230	350	57.9	45.7	J-697
267	J-141	TRUE	60	95.68	60	95.68	22	21.8	J-143
268	J-8	TRUE	230	350	230.06	350.06	58.8	45.5	J-697
270	J-118	TRUE	60	106.71	60.09	106.8	21.8	23.8	J-111
271	J-34	TRUE	230	350	230	350	57.5	48.9	J-697
272	J-263	TRUE	230	350	230	350	35.6	24.7	J-567
273	J-135	TRUE	60	115.04	60.1	115.15	30.5	21.8	J-346
274	J-121	TRUE	60	121.26	60.02	121.29	23.1	21.8	J-346
275	J-181	TRUE	230	296.63	230.01	296.64	41.6	21.8	J-567
276	J-264	TRUE	230	350	231.01	351.01	31.7	22.7	J-567
277	J-220	TRUE	230	310.44	230.13	310.58	33.2	21.8	J-567
278	J-252	TRUE	60	72.63	60.02	72.66	27.4	21.8	J-371
279	J-142	TRUE	60	86.96	60	86.96	21.8	31.1	J-143
280	J-109	TRUE	60	108.31	60.04	108.36	29.3	21.8	J-111
281	J-129	TRUE	60	124.5	60.09	124.59	23.1	21.8	J-346
282	J-39	TRUE	230	350	230	350	57.9	49.7	J-697
283	J-164	TRUE	60	225.55	60	225.55	34.9	21.8	J-480
285	J-219	TRUE	230	309.86	230.04	309.9	37.7	21.8	J-567
286	J-469	TRUE	230	350	230	350	28.1	27.3	J-229
287	J-256	TRUE	60	66.64	60.05	66.69	21.8	21.8	J-499
288	J-120	TRUE	60	119.05	60	119.05	22.9	21.8	J-111
289	J-230	TRUE	230	339.68	230	339.68	23.7	21.8	J-229
290	J-130	TRUE	60	124.96	60.04	125	30.4	21.8	J-346
291	J-117	TRUE	60	108.14	60.06	108.2	21.8	22.4	J-118
292	J-223	TRUE	230	307.14	230.01	307.15	26.2	21.8	J-317
293	J-218	TRUE	230	350	230	350	59.4	50.1	J-372
294	J-46	TRUE	230	350	230	350	53.8	48.1	J-697
295	J-2	TRUE	230	350	230.18	350.18	44.5	43	J-697
296	J-26	TRUE	230	350	230.01	350.01	56.4	47.3	J-697
297	J-189	TRUE	60	244.24	60.06	244.3	41.7	21.8	J-372
298	J-211	TRUE	230	322.24	230	322.24	21.8	21.9	J-212
299	J-23	TRUE	230	350	230.02	350.02	53.6	47.2	J-697
301	J-59	TRUE	230	350	231.01	351.01	59.9	50.1	J-372
302	J-156	TRUE	60	105.81	60	105.81	31.2	21.8	J-480
303	J-199	TRUE	230	338.77	230.01	338.78	21.8	23.1	J-567

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305	J-148	TRUE	60	118.22	60.01	118.23	29.7	21.8	J-480
306	J-132	TRUE	60	124.58	60.04	124.61	27.5	21.8	J-346
307	J-19	TRUE	230	350	230	350	56.3	46.2	J-697
308	J-83	TRUE	60	93.36	60	93.36	24.3	21.8	J-372
309	J-139	TRUE	60	91.54	60.06	91.6	21.8	34	J-346
310	J-133	TRUE	60	123.56	60.04	123.59	25.6	21.8	J-346
311	J-96	TRUE	60	118.91	60.05	118.95	32.4	21.8	J-111
312	J-204	TRUE	230	326.34	230	326.34	35.1	21.8	J-567
313	J-52	TRUE	230	350	230	350	60.8	50	J-697
314	J-55	TRUE	230	350	230.05	350.05	59.8	50.1	J-372
315	J-74	TRUE	60	178.95	60	178.95	36.1	21.8	J-491
316	J-253	TRUE	60	71.03	60.01	71.04	27.4	21.8	J-371
317	J-225	TRUE	230	276.76	230	276.76	24.4	21.8	J-317
318	J-186	TRUE	230	305.05	230	305.05	47.9	21.8	J-567
319	J-66	TRUE	230	350	230	350	61.7	50.1	J-372
320	J-227	TRUE	230	283.94	230	283.95	22.9	21.8	J-228
321	J-54	TRUE	230	350	230.01	350.01	57.9	50.1	J-372
322	J-470	TRUE	230	350	230	350	30.5	27.5	J-229
323	J-165	TRUE	60	244.54	60	244.54	32.6	21.8	J-480
324	J-32	TRUE	230	350	230.05	350.05	59.3	48.6	J-697
325	J-42	TRUE	230	350	230.03	350.03	58.3	49.2	J-697
326	J-178	TRUE	230	289.68	230.11	289.79	32.5	21.8	J-567
327	J-93	TRUE	60	121.34	60.09	121.43	22.2	21.8	J-111
328	J-97	TRUE	60	116.09	60.05	116.14	36.3	21.8	J-111
329	J-122	TRUE	60	121.21	60.03	121.24	26.3	21.8	J-346
330	J-84	TRUE	60	89.21	60.01	89.22	24.1	21.8	J-87
331	J-62	TRUE	230	350	230	350	52.4	50.1	J-372
332	J-29	TRUE	230	350	230.01	350.01	54.1	47.9	J-697
333	J-94	TRUE	60	121.29	60	121.29	30.2	21.8	J-111
334	J-72	TRUE	60	112.74	60.05	112.79	21.8	28.8	J-693
335	J-188	TRUE	230	303.08	230	303.08	46.7	21.8	J-567
336	J-231	TRUE	60	187.82	60	187.82	26.2	21.8	J-491
337	J-229	TRUE	230	293.35	230.25	293.6	21.8	33.8	J-230
338	J-466	TRUE	230	350	230	350	27.9	26.9	J-229
339	J-10	TRUE	230	350	230.09	350.09	46	45.4	J-697
340	J-95	TRUE	60	120.19	60.02	120.21	31.1	21.8	J-111
341	5 (Dum	TRUE	230	350	231.13	351.13	52.3	47.2	J-697
342	J-78	TRUE	60	153.19	60	153.19	50.5	21.8	J-372
343	J-99	TRUE	60	110.77	60.11	110.88	32.5	21.8	J-111
345	J-7	TRUE	230	350	230	350	41.6	41.3	J-6
346	J-196	TRUE	230	346.12	230.08	346.2	38.1	21.8	J-567
347	J-208	TRUE	230	350	230.01	350.01	24	26.3	J-229
348	J-68	TRUE	60	91.66	60.06	91.73	33.3	21.8	J-491
349	J-73	TRUE	60	170.94	60.1	171.04	38.4	21.8	J-491
350	J-79	TRUE	60	125.96	60	125.96	49.7	21.8	J-372
351	J-464	TRUE	230	350	230	350	28.6	26.5	J-229
352	J-221	TRUE	230	310.42	230	310.42	29.2	21.8	J-317
353	J-63	TRUE	230	350	230.06	350.06	52	50.1	J-372
354	J-48	TRUE	230	350	230	350	54.8	48.5	J-697
355	J-173	TRUE	60	172.28	60.1	172.38	23	21.8	J-170
356	J-136	TRUE	60	116.07	60	116.07	26.5	21.8	J-346
357	J-255	TRUE	60	73.68	60.04	73.72	40.4	21.8	J-491
358	J-137	TRUE	60	121.52	60.07	121.59	23.7	21.8	J-346
359	J-44	TRUE	230	350	230	350	58.4	48.7	J-697
363	J-69	TRUE	60	107.52	60.07	107.59	36.9	21.8	J-491
364	J-461	TRUE	230	319.07	230.04	319.11	21.8	26.6	J-542
365	J-50	TRUE	230	350	230	350	54.1	48.4	J-697

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366	J-58	TRUE	230	350	230.01	350.01	61.5	50.1	J-372
367	J-61	TRUE	230	350	230.01	350.01	54.3	50.1	J-372
368	6 (Dum	TRUE	230	350	231.13	351.13	58.3	50.1	J-372
369	J-47	TRUE	230	350	230.01	350.01	54.2	47.7	J-697
370	J-176	TRUE	60	139.79	60.21	140	21.8	23.3	J-170
371	J-128	TRUE	60	108.97	60.06	109.03	22.9	21.8	J-138
372	J-151	TRUE	60	106.34	60.03	106.37	32.8	21.8	J-480
373	J-13	TRUE	230	350	230.01	350.01	53.1	46.2	J-697
374	J-33	TRUE	230	350	230.01	350.01	58.2	48.7	J-697
376	J-123	TRUE	60	120.97	60.01	120.98	27.7	21.8	J-346
378	J-21	TRUE	230	350	230.06	350.06	53.2	46.6	J-697
379	0 (Dum	TRUE	230	290.96	231.13	292.08	39.5	21.8	J-567
380	J-202	TRUE	230	316.3	230	316.3	45	21.8	J-567
381	J-168	TRUE	230	289.26	230	289.26	31.1	21.8	J-567
382	J-49	TRUE	230	350	230.06	350.06	53	48.4	J-697
383	J-110	TRUE	60	100.39	60.07	100.47	24.8	21.8	J-111
384	J-102	TRUE	60	108.42	60.04	108.47	23.4	21.8	J-103
385	J-31	TRUE	230	350	230	350	59.1	48.4	J-697
386	J-147	TRUE	60	133.89	60	133.89	31.8	21.8	J-480
387	J-28	TRUE	230	350	230	350	53.6	47.7	J-697
388	J-24	TRUE	230	350	230.01	350.01	51.2	47.1	J-697
389	J-465	TRUE	230	350	230	350	26.3	26.6	J-229
390	J-154	TRUE	60	90.2	60.05	90.25	30.5	21.8	J-480
391	J-89	TRUE	60	70.04	60.03	70.06	21.8	22.9	J-90
392	J-153	TRUE	60	94.67	60.04	94.72	31.8	21.8	J-480
394	J-98	TRUE	60	112.37	60.05	112.42	34.7	21.8	J-111
395	J-259	TRUE	230	350	230.19	350.19	45.3	45.8	J-461
396	J-3	TRUE	230	350	230.15	350.15	44.5	43.5	J-697
397	J-85	TRUE	60	85.8	60	85.8	24.2	21.8	J-87
398	J-71	TRUE	60	128.73	60.05	128.77	24.8	21.8	J-491
399	J-116	TRUE	60	108.09	60.05	108.14	21.8	22.8	J-111
400	J-167	TRUE	230	290.02	230	290.02	32	21.8	J-567
401	J-70	TRUE	60	128.73	60.05	128.77	40.4	21.8	J-491
402	J-43	TRUE	230	350	230	350	58	48.9	J-697
403	J-179	TRUE	230	290.11	230	290.11	36	21.8	J-567
406	J-224	TRUE	230	303.04	230.13	303.17	27.4	21.8	J-317
407	J-35	TRUE	230	350	230	350	63.6	49.1	J-697
408	J-145	TRUE	60	126.22	60	126.22	34.8	21.8	J-346
409	J-170	TRUE	60	118.47	60	118.47	21.8	31	J-177
410	J-228	TRUE	230	274.67	230.09	274.75	21.8	24.4	J-567
411	J-15	TRUE	230	350	230.1	350.1	52.6	46.8	J-697
412	eson Zo	TRUE	230	350	230.13	350.13	53.2	50.1	J-372
413	J-262	TRUE	230	350	230	350	36.8	27.5	J-567
414	J-76	TRUE	60	181.27	60	181.27	49.6	21.8	J-372
415	J-82	TRUE	60	93.36	60	93.36	31.7	21.8	J-372
416	J-187	TRUE	230	304.1	230.03	304.13	47.3	21.8	J-567
417	J-124	TRUE	60	120.63	60	120.63	29.8	21.8	J-346
418	J-86	TRUE	60	79.56	60.04	79.6	23.6	21.8	J-87
419	J-101	TRUE	60	109.36	60.07	109.44	21.8	21.9	J-111
420	J-140	TRUE	60	101.39	60.03	101.43	21.8	31.1	J-346
422	J-198	TRUE	230	344.43	230.36	344.8	26	21.8	J-567
423	J-248	TRUE	230	325.78	230	325.78	21.8	22.8	J-211
424	J-247	TRUE	230	343.37	230	343.37	22.1	21.8	J-248
426	J-5	TRUE	230	350	230	350	46.7	44	J-697
427	J-171	TRUE	60	193.45	60.06	193.5	23.6	21.8	J-170
428	J-22	TRUE	230	350	230.02	350.02	55.3	47.2	J-697
429	J-16	TRUE	230	350	230	350	53.3	46.9	J-697

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430	J-184	TRUE	230	307.29	230.05	307.35	44.1	21.8	J-567
431	J-57	TRUE	230	350	230	350	58.3	50.1	J-372
432	J-11	TRUE	230	350	230.12	350.12	44	45.7	J-697
433	J-467	TRUE	230	350	230.2	350.2	28.1	27	J-229
434	J-127	TRUE	60	108.95	60.05	109	21.8	26.7	J-346
435	J-20	TRUE	230	350	230.01	350.01	52.5	46.4	J-697
436	J-172	TRUE	60	184.08	60.06	184.13	21.8	21.8	J-170
437	J-157	TRUE	60	142.8	60.03	142.82	33.5	21.8	J-480
438	J-161	TRUE	60	185.47	60	185.47	40	21.8	J-480
439	J-114	TRUE	60	116.18	60.01	116.18	25.6	21.8	J-111
440	J-149	TRUE	60	108.47	60.03	108.49	31.6	21.8	J-480
441	akesho	TRUE	60	116.18	60.08	116.26	31.3	21.8	J-111
442	J-257	TRUE	60	71.73	60.01	71.74	21.8	21.8	J-499
443	J-155	TRUE	60	84.33	60.04	84.37	29.1	21.8	J-480
444	0 (Dum	TRUE	60	98.94	61.13	100.07	42.7	21.8	J-372
445	J-125	TRUE	60	201.58	60.07	201.64	21.8	21.8	J-209
446	J-193	TRUE	60	242.05	60.05	242.1	31.2	21.8	J-372
447	J-194	TRUE	60	142.01	60.05	142.06	21.8	41.8	J-372
448	J-209	TRUE	60	143.24	60.06	143.29	21.8	38.9	J-372
449	J-214	TRUE	60	159.46	60	159.46	21.8	36.5	J-372
450	J-215	TRUE	60	237.06	60	237.06	21.8	24.7	J-372
451	J-216	TRUE	230	278.57	230	278.57	21.8	50.1	J-372
452	J-274	TRUE	60	242.28	60	242.28	32.3	21.8	J-372
453	J-275	TRUE	230	273.93	230.01	273.94	22.5	21.8	J-567
454	J-276	TRUE	230	301.21	230.02	301.23	47.2	21.8	J-567
455	J-277	TRUE	230	298.36	230.01	298.37	44.6	21.8	J-567
456	J-278	TRUE	230	350	230	350	54.1	50.1	J-372
457	9 (Dum	TRUE	230	350	231.13	351.13	48.2	50.1	J-372
458	J-280	TRUE	230	350	230.34	350.34	42.7	50.1	J-372
460	J-317	TRUE	230	245.87	230	245.87	21.8	31.8	J-225
461	reme S	TRUE	230	350	230	350	40	41	J-450
462	J-369	TRUE	230	350	230.04	350.04	47.3	43.7	J-697
463	J-413	TRUE	60	107.98	60	107.98	21.8	22.1	J-111
464	J-414	TRUE	230	350	230.01	350.01	34	26.4	J-567
465	J-415	TRUE	230	350	230	350	53.7	44.9	J-697
466	J-416	TRUE	230	350	230	350	35.9	27	J-567
467	J-417	TRUE	230	350	230	350	66.2	48	J-697
468	J-418	TRUE	230	350	230	350	66	47.8	J-697
469	J-426	TRUE	230	264.67	230	264.67	21.8	50.1	J-372
470	J-427	TRUE	230	288.25	230.16	288.41	21.8	50.1	J-372
472	J-433	TRUE	230	350	230.02	350.02	52.9	50.1	J-372
473	J-455	TRUE	60	102.81	60.01	102.82	21.8	25.7	J-346
474	J-456	TRUE	60	121.6	60	121.6	25.8	21.8	J-346
475	J-457	TRUE	60	121.51	60.03	121.54	25.6	21.8	J-346
476	J-458	TRUE	60	113	60.01	113.01	24	21.8	J-459
477	J-459	TRUE	60	106.44	60	106.44	21.8	28.1	J-346
478	J-460	TRUE	60	112.53	60.02	112.55	21.8	25.6	J-346
479	J-462	TRUE	60	121.47	60.01	121.49	25.5	21.8	J-346
480	J-473	TRUE	60	121.45	60	121.45	25.6	21.8	J-346
481	J-474	TRUE	230	350	230	350	22.4	24.7	J-567
482	J-475	TRUE	60	82.65	60	82.65	29.9	21.8	J-480
483	J-476	TRUE	60	80.33	60	80.33	30.5	21.8	J-480
484	J-477	TRUE	60	71.6	60.06	71.66	27.2	21.8	J-480
485	J-478	TRUE	60	66.27	60	66.27	21.8	21.8	J-480
486	J-479	TRUE	60	61.04	60	61.04	21.8	21.8	J-480
487	J-480	FALSE	60	57.56	60.03	57.59	21.8	24.8	J-479
488	ntry Sq	TRUE	60	65.38	60.01	65.39	22.6	21.8	J-482

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
489	J-482	TRUE	60	63.53	60	63.53	21.8	24	J-480
490	J-483	TRUE	60	68.74	60	68.74	21.8	24.8	J-88
491	J-484	TRUE	60	73.13	60	73.13	40.3	21.8	J-491
492	J-485	TRUE	60	72.79	60.02	72.81	40.3	21.8	J-491
493	reenbri	TRUE	60	72.46	60.06	72.53	39.9	21.8	J-491
494	J-487	TRUE	60	72.03	60.02	72.05	35.1	21.8	J-491
495	J-488	TRUE	60	71.7	60	71.7	33.2	21.8	J-491
496	J-489	TRUE	60	71.28	60.01	71.29	29.2	21.8	J-491
497	J-490	TRUE	60	71.01	60	71.01	26.2	21.8	J-491
498	J-491	TRUE	60	70.71	60	70.71	21.8	24.5	J-353
499	J-492	TRUE	230	339.53	230.03	339.56	21.8	23.5	J-685
500	J-493	TRUE	230	285.07	230	285.07	21.8	24.3	J-496
501	J-494	TRUE	230	255.2	230	255.2	23.8	21.8	J-496
502	J-496	TRUE	230	237.41	230	237.41	21.8	23.7	J-701
503	J-497	FALSE	230	219.13	230.29	219.42	22.3	21.8	J-579
504	J-498	FALSE	230	204.47	230	204.47	21.8	23	J-579
505	J-499	TRUE	60	63.5	60.05	63.55	21.8	27	J-256
506	J-500	TRUE	60	223.25	60.04	223.29	21.8	28.6	J-372
507	anattor	TRUE	230	350	230	350	33.2	34.4	J-569
508	J-502	TRUE	60	172.16	60.03	172.19	22.7	21.8	J-505
509	J-503	TRUE	60	147.41	60.04	147.45	22.1	21.8	J-505
510	J-504	TRUE	60	127.48	60.05	127.53	22.9	21.8	J-505
511	J-505	TRUE	60	115.19	60.07	115.26	21.8	33.1	J-504
512	J-506	TRUE	60	183.08	60.04	183.12	21.8	21.8	J-507
513	J-507	TRUE	60	144.31	60.05	144.36	21.8	34.4	J-372
514	J-508	TRUE	230	350	230	350	48.4	38.8	J-697
515	J-510	TRUE	60	76.21	60	76.21	37.4	21.8	J-372
516	J-511	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
518	J-338	TRUE	60	101.98	60	101.98	27.5	21.8	J-346
519	J-339	TRUE	60	107.92	60.07	107.99	26	21.8	J-346
520	J-340	TRUE	60	101.59	60.16	101.75	24.3	21.8	J-346
521	J-341	TRUE	60	96.86	60	96.86	21.8	24.2	J-346
522	J-342	TRUE	60	97.71	60	97.71	29.5	21.8	J-346
523	J-343	TRUE	60	84.21	60.1	84.32	26.9	21.8	J-346
524	J-344	TRUE	60	76.17	60	76.17	24.9	21.8	J-346
525	J-345	TRUE	60	71.06	60.07	71.14	23.3	21.8	J-346
526	J-346	TRUE	60	66.77	60	66.77	21.8	26.6	J-345
527	J-347	TRUE	60	73.48	60	73.48	38.1	21.8	J-491
528	J-348	TRUE	60	72.92	60.14	73.07	28.5	21.8	J-491
529	J-349	TRUE	60	71.97	60.05	72.02	27.4	21.8	J-491
530	J-350	TRUE	60	71.79	60	71.79	21.8	21.8	J-491
531	J-351	TRUE	60	71.52	60	71.52	22.7	21.8	J-491
532	J-352	TRUE	60	71.25	60	71.25	26	21.8	J-491
533	J-353	TRUE	60	71.03	60	71.03	22.9	21.8	J-491
549	J-371	TRUE	60	63.51	60	63.51	21.8	28	J-682
550	J-372	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
551	J-373	TRUE	60	145.52	60	145.52	21.8	23.5	J-176
552	J-374	TRUE	60	160.12	60	160.12	21.8	23.4	J-373
553	J-375	TRUE	60	185.7	60	185.7	21.8	23.4	J-374
565	J-388	TRUE	230	258.03	230	258.03	21.8	27.9	J-567
567	J-390	TRUE	230	350	230.14	350.14	56.8	46.3	J-697
568	1 (Dum	TRUE	230	350	231.13	351.13	45.3	41.4	J-697
569	J-392	TRUE	230	350	230.02	350.02	31	28.9	J-697
570	J-393	TRUE	230	350	237.49	357.49	37.2	31.9	J-650
593	J-424	TRUE	230	350	230.04	350.04	54.4	42.5	J-697
594	J-425	TRUE	230	350	230	350	40.5	36.8	J-697
602	J-437	TRUE	60	105.36	60	105.36	25.2	21.8	J-346

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
614	J-449	TRUE	230	350	230.35	350.35	23	26	J-208
615	J-450	TRUE	230	350	230	350	39.4	41.2	Supreme Steel
616	J-451	TRUE	230	295.54	230.13	295.67	38	21.8	J-567
617	J-452	TRUE	60	83.4	60.12	83.51	21.8	22.3	J-346
618	J-453	TRUE	60	105.32	60.1	105.42	22.3	21.8	J-346
619	J-454	TRUE	230	336.89	230.14	337.03	21.8	27.8	J-668
621	J-481	TRUE	230	350	230.19	350.19	45.6	38.5	J-607
623	J-495	TRUE	230	350	230	350	65.2	47.2	J-697
624	J-514	TRUE	230	350	230.07	350.07	49.7	47	J-697
1202	J-515	TRUE	230	269.92	230.07	270	21.8	32.2	J-695
1205	J-516	TRUE	230	350	230	350	37.5	32.9	J-650
1210	J-518	TRUE	230	350	230	350	34	42.5	J-697
1212	J-519	TRUE	230	350	230	350	51.1	46.3	J-697
1215	J-520	TRUE	60	124.45	60	124.45	21.8	29.9	J-373
1217	J-521	TRUE	60	72.39	60	72.39	26	21.8	J-491
1221	J-523	TRUE	60	70.04	60	70.04	21.8	24.3	J-491
1223	J-524	TRUE	60	71.97	60	71.97	27	21.8	J-491
1225	J-525	TRUE	60	68.86	60	68.86	21.8	24.7	J-491
1247	J-529	TRUE	230	350	230	350	48.6	46.7	J-530
1250	J-530	TRUE	230	350	230	350	36.8	45	J-531
1252	J-531	TRUE	230	350	230	350	34.3	44	J-532
1254	J-532	TRUE	230	350	230	350	38.6	43.2	J-531
1261	J-535	TRUE	230	350	230	350	35.9	38.8	Panattoni
1279	J-542	TRUE	230	304.04	230	304.04	21.8	27.4	J-461
1303	J-550	TRUE	230	350	230	350	33.9	33.5	J-668
1308	J-552	TRUE	60	93.36	60.01	93.37	27.9	21.8	J-372
1310	J-553	TRUE	60	70.47	60	70.47	21.8	22.2	J-346
1313	J-554	TRUE	230	339.64	230	339.64	37.5	21.8	J-567
1317	J-555	TRUE	230	350	230	350	34.8	22.4	J-567
1320	J-556	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1322	J-557	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1323	J-558	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1330	J-560	TRUE	230	255.68	230.2	255.88	21.8	25.6	J-709
1333	J-561	TRUE	230	350	230	350	56.5	50.1	J-372
1336	J-562	TRUE	230	296.48	230.02	296.5	43.2	21.8	J-567
1339	J-563	TRUE	230	293.73	230.44	294.17	32.4	21.8	J-567
1342	J-564	TRUE	230	291.54	230	291.54	30.3	21.8	J-567
1345	J-565	TRUE	230	276.96	230	276.96	30.1	21.8	J-567
1348	J-566	TRUE	230	259.05	230.01	259.06	22.4	21.8	J-567
1351	J-567	TRUE	230	236.66	230.02	236.68	21.8	28.1	J-566
1353	J-568	TRUE	230	350	230	350	27.2	27.6	J-567
1356	J-569	TRUE	230	350	230	350	31.5	34	J-578
1359	J-570	TRUE	230	350	230	350	27.9	29.4	J-571
1362	J-571	TRUE	230	350	230	350	26.5	28.1	J-578
1366	J-573	TRUE	230	350	230.08	350.08	40.7	41.4	J-698
1369	J-574	TRUE	230	350	230	350	42.6	40.6	J-607
1372	J-575	TRUE	230	350	230	350	44	42.8	J-697
1375	J-576	TRUE	230	350	230.74	350.74	49.1	42	J-697
1387	J-578	TRUE	230	350	230	350	26	28.6	J-571
1390	J-579	FALSE	230	206.48	230	206.48	21.8	22.4	J-498
1405	J-586	TRUE	230	350	230.04	350.04	46.8	41.8	J-697
1452	J-602	TRUE	60	73.45	60	73.45	33.3	21.8	J-491
1473	J-607	TRUE	230	292.72	230	292.72	21.8	48.8	J-697
1475	J-608	TRUE	230	350	230	350	43.6	40.3	J-697
1478	J-609	TRUE	230	350	230	350	32.9	40.3	J-697
1480	J-610	TRUE	230	350	230.32	350.32	44.9	40.7	J-697
1483	J-611	TRUE	230	350	230	350	53.9	44.7	J-697

Existing System Analysis
Maximum Day Demand Plus Fire Flow

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
1499	J-613	TRUE	230	246.03	230	246.03	21.8	24.9	J-709
1504	J-614	TRUE	230	272.07	230	272.07	28.5	21.8	J-567
1556	J-628	TRUE	230	350	230	350	37.4	31.1	J-697
1559	J-629	TRUE	230	350	230	350	57.8	34.4	J-697
1619	J-634	TRUE	230	350	230	350	34.6	29.6	J-697
1681	J-642	TRUE	230	350	230	350	37.3	32.3	J-650
1741	J-647	TRUE	230	350	230	350	30.1	29.4	J-650
1744	8 (Dum	TRUE	230	337.34	231.13	338.47	21.8	25.6	J-649
1746	J-649	TRUE	230	338.32	230	338.32	21.8	25.3	J-648 (Dummy)
1748	J-650	TRUE	230	350	230	350	28.6	30.5	J-697
1857	J-662	TRUE	60	88.57	60	88.57	21.8	24.3	J-372
1859	J-663	TRUE	60	83.25	60	83.25	21.8	24.6	J-87
1930	J-668	TRUE	230	350	230	350	23	24.1	J-454
1949	J-675	TRUE	230	350	230	350	43.9	39.7	J-607
1952	J-676	TRUE	230	350	230	350	44.7	40.2	J-607
1965	J-682	TRUE	60	66.64	60	66.64	23.8	21.8	J-371
1974	J-685	TRUE	230	308.97	230	308.97	21.8	23.7	J-493
1980	J-687	TRUE	230	350	230	350	43.2	41.4	J-697
1983	J-688	TRUE	230	350	230	350	48.4	45.6	J-697
1986	J-689	TRUE	230	350	230	350	46.2	41.7	J-697
1989	J-690	TRUE	60	84.28	60	84.28	40.5	21.8	J-372
1995	J-692	TRUE	60	68.74	60	68.74	21.8	21.8	J-499
1998	J-693	TRUE	60	120.35	60	120.35	21.8	21.8	J-72
2001	J-694	TRUE	230	241.13	230	241.13	21.8	37.5	J-695
2004	J-695	TRUE	230	240.12	230	240.12	21.8	37.1	J-694
2009	J-697	TRUE	230	350	230	350	27.6	32.6	J-650
2012	J-698	TRUE	230	350	230	350	41	41.4	J-573
2015	J-699	TRUE	230	350	230	350	53.9	44	J-697
2024	J-701	FALSE	230	228.49	230	228.49	21.8	22.9	J-579
2048	J-709	TRUE	230	253.99	230	253.99	21.8	22.2	J-613
2142	J-719	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2145	J-720	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2148	J-721	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2153	J-723	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2155	J-724	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2157	J-725	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
185	J-160	584,027.01	5,934,838.88	678.02	0	79.10	733.71
186	J-222	582,145.56	5,932,813.74	700.26	0	63.70	745.15
187	J-162	583,810.38	5,934,670.57	685.00	0	69.20	733.73
188	J-138	584,613.67	5,935,181.42	678.38	0	78.40	733.63
189	J-192	581,191.96	5,933,912.97	677.56	0	96.00	745.15
190	J-119	584,936.53	5,935,869.14	667.10	0	70.70	716.87
191	J-134	584,764.89	5,935,072.26	680.51	0.1	75.40	733.65
192	J-67	581,650.04	5,931,561.40	710.00	0.01	79.20	765.82
193	J-38	581,243.76	5,931,279.09	710.00	0.02	79.50	765.99
194	J-41	581,141.03	5,931,480.63	710.00	0.05	79.40	765.96
195	J-144	584,396.66	5,935,219.39	675.00	0	83.20	733.62
196	J-37	581,243.76	5,931,168.95	710.00	0.01	79.50	766.01
197	J-472	580,740.47	5,933,183.14	689.91	0	78.40	745.17
198	J-201	581,815.00	5,933,229.15	690.13	0	78.10	745.15
199	J-91	582,694.12	5,935,128.13	658.00	0	82.30	715.98
200	J-103	585,091.20	5,936,277.99	665.00	0.12	73.60	716.87
201	J-53	581,438.28	5,930,980.15	710.00	0.12	79.50	765.97
202	J-40	581,233.98	5,931,482.32	710.00	0.01	79.40	765.95
203	J-107	584,778.23	5,935,996.97	664.16	0	74.80	716.87
204	J-212	581,825.45	5,932,053.99	710.00	0	78.40	765.25
205	J-197	581,603.91	5,933,472.82	685.44	0	84.80	745.15
206	J-159	584,150.38	5,934,848.85	679.15	0	77.40	733.71
207	J-163	583,696.80	5,934,580.94	685.00	0	69.20	733.74
208	J-92	582,355.13	5,935,027.71	660.00	0.09	79.50	715.98
209	J-90	582,616.55	5,935,084.61	660.00	0.19	79.50	715.98
210	J-111	585,098.38	5,935,794.30	672.05	0.17	63.60	716.87
211	J-177	583,865.02	5,934,178.46	693.29	0	57.40	733.74
212	J-471	580,745.35	5,933,130.74	690.00	0	78.30	745.17
213	J-233	584,681.75	5,934,979.21	681.75	0.14	73.70	733.65
214	68 (Dum	580,952.95	5,932,747.92	698.59	2.54	66.10	745.17
215	J-1	579,511.27	5,931,168.86	705.00	0.68	86.50	765.97
216	J-174	583,865.88	5,934,330.48	690.60	0.13	61.20	733.74
218	J-131	584,433.28	5,934,995.60	679.54	0.14	76.80	733.65
219	J-100	584,835.40	5,936,162.83	665.00	0.2	73.60	716.87
220	J-75	581,067.83	5,934,963.64	655.66	0	85.60	715.94
221	J-60	581,268.02	5,931,483.28	710.00	0	79.40	765.94
222	J-217	581,836.74	5,931,627.98	710.00	0	79.10	765.70
223	J-146	584,443.42	5,934,865.47	686.39	0	67.10	733.67
224	J-6	579,945.01	5,931,013.88	708.42	0.03	81.70	765.98
225	J-169	583,532.49	5,933,358.14	700.00	0	64.00	745.09
226	J-4	579,847.42	5,931,278.15	705.69	0	85.60	765.97
227	J-27	580,669.54	5,930,951.45	710.00	0.09	79.50	765.98
228	J-158	584,415.79	5,934,856.33	685.70	0	68.10	733.69
229	J-14	580,335.90	5,931,383.96	710.00	0	79.50	765.97
230	J-105	584,480.67	5,935,747.97	663.83	0.18	75.30	716.88
231	J-261	581,205.35	5,933,531.77	685.10	0	85.20	745.15
232	J-51	581,311.65	5,930,974.43	710.00	0.24	79.50	766.02

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
233	J-183	582,114.01	5,933,238.15	690.57	0	77.50	745.14
234	J-106	584,742.82	5,936,007.34	663.04	0.1	76.40	716.87
235	J-244	581,247.28	5,930,944.87	712.82	0	75.60	766.06
236	J-185	582,109.89	5,933,372.58	689.49	0.43	79.00	745.13
237	J-205	581,855.89	5,932,883.46	697.62	0	67.50	745.17
238	J-88	582,477.45	5,934,962.82	661.52	0.17	77.30	715.98
239	J-87	582,416.94	5,934,900.96	661.92	0	76.70	715.98
240	J-104	584,294.78	5,935,708.60	663.84	0.18	75.30	716.88
241	J-246	581,897.49	5,931,628.85	710.00	0	79.00	765.64
242	J-232	584,892.94	5,934,920.80	684.28	0	70.10	733.64
243	J-30	580,902.68	5,930,954.31	710.00	0.07	79.50	765.99
244	J-9	580,323.88	5,930,706.90	710.00	0.05	79.50	765.98
245	J-182	582,375.00	5,933,263.31	692.23	0.14	75.10	745.13
246	J-203	581,820.84	5,933,082.06	694.39	0.27	72.10	745.16
247	J-65	581,778.70	5,931,509.37	710.00	0	79.20	765.79
248	J-113	584,707.09	5,935,813.70	666.13	0	72.00	716.88
249	J-126	584,863.23	5,935,234.31	677.59	0.17	79.60	733.64
251	J-175	583,860.04	5,934,212.11	692.89	0.08	58.00	733.74
252	J-108	584,859.07	5,935,946.29	665.31	0.05	73.20	716.87
253	J-152	584,376.31	5,934,716.20	687.39	0.16	65.70	733.67
254	J-200	581,603.76	5,933,231.65	690.97	0	76.90	745.15
255	J-36	581,245.19	5,931,074.55	710.09	0	79.40	766.02
256	J-143	584,418.36	5,935,234.31	675.12	0	83.00	733.62
257	J-81	581,858.80	5,934,643.74	665.00	0	72.40	715.99
258	J-12	580,220.70	5,931,351.93	710.00	0	79.50	765.97
259	J-226	582,264.78	5,932,630.99	705.95	0.07	55.60	745.15
260	J-45	580,893.42	5,931,477.97	710.00	0.08	79.40	765.97
261	J-17	580,311.95	5,931,197.47	710.00	0	79.50	765.98
262	J-206	581,857.12	5,932,625.05	705.00	0	57.00	745.18
263	J-115	584,825.79	5,935,796.19	666.72	0.06	71.20	716.88
264	J-150	584,403.44	5,934,788.09	687.49	0	65.60	733.67
265	J-77	581,167.95	5,934,784.85	659.73	0	79.80	715.95
266	J-18	580,314.80	5,931,075.86	708.85	0	81.10	765.98
267	J-141	584,418.36	5,935,257.37	675.00	0	83.20	733.62
268	J-8	580,315.10	5,931,044.42	708.00	0.13	82.30	765.98
270	J-118	585,014.92	5,935,991.35	667.08	0.2	70.70	716.87
271	J-34	581,184.46	5,930,958.60	713.60	0	74.40	766.03
272	J-263	580,990.65	5,933,540.47	686.38	0	83.40	745.16
273	J-135	584,890.35	5,935,064.77	680.00	0.23	76.10	733.64
274	J-121	584,820.49	5,935,506.24	675.00	0.05	59.50	716.88
275	J-181	582,540.59	5,933,275.94	693.31	0.03	73.50	745.12
276	J-264	581,189.28	5,933,693.30	681.63	2.27	90.20	745.15
277	J-220	582,117.40	5,932,983.49	695.93	0.29	69.90	745.14
278	J-252	578,937.82	5,934,828.30	660.00	0.05	79.40	715.93
279	J-142	584,423.78	5,935,296.70	675.00	0	83.20	733.62
280	J-109	584,921.74	5,935,884.21	666.76	0.1	71.10	716.87
281	J-129	584,501.09	5,935,261.44	676.15	0.2	81.60	733.62

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
282	J-39	581,239.51	5,931,322.53	710.00	0	79.50	765.98
283	J-164	583,606.03	5,934,540.88	685.74	0	68.10	733.75
285	J-219	582,113.42	5,933,083.07	693.64	0.09	73.10	745.14
286	J-469	580,912.58	5,932,829.94	695.69	0	70.20	745.17
287	J-256	580,441.19	5,935,464.19	655.00	0.1	86.50	715.93
288	J-120	584,734.38	5,935,692.75	670.15	0	66.30	716.88
289	J-230	581,106.83	5,932,460.94	706.93	0	54.30	745.18
290	J-130	584,431.22	5,935,093.29	677.58	0.1	79.60	733.64
291	J-117	585,014.92	5,936,121.64	665.00	0.13	73.60	716.87
292	J-223	582,152.61	5,932,731.90	702.98	0.01	59.90	745.15
293	J-218	581,867.74	5,931,628.35	710.00	0	79.00	765.67
294	J-46	580,798.60	5,931,476.05	710.00	0	79.40	765.97
295	J-2	579,680.28	5,931,170.16	705.50	0.41	85.80	765.97
296	J-26	580,564.63	5,931,456.51	710.00	0.02	79.40	765.97
297	J-189	581,084.12	5,934,453.39	665.00	0.14	72.30	715.95
298	J-211	581,876.01	5,932,068.33	710.09	0	78.30	765.25
299	J-23	580,668.11	5,931,070.17	710.00	0.04	79.50	765.98
301	J-59	581,386.82	5,931,485.18	710.00	2.27	79.40	765.90
302	J-156	584,404.53	5,934,722.07	688.13	0	64.60	733.67
303	J-199	581,769.17	5,933,510.82	685.00	0.02	85.40	745.15
305	J-148	584,454.98	5,934,760.96	689.42	0.02	62.80	733.67
306	J-132	584,558.06	5,935,001.03	680.87	0.09	74.90	733.65
307	J-19	580,403.49	5,931,080.18	707.98	0	82.30	765.98
308	J-83	581,967.59	5,934,879.14	661.00	0	78.00	715.98
309	J-139	584,644.86	5,935,312.98	676.87	0.12	80.60	733.63
310	J-133	584,653.03	5,935,049.18	680.00	0.09	76.10	733.65
311	J-96	584,368.02	5,935,856.50	660.02	0.11	80.70	716.88
312	J-204	581,850.05	5,933,080.11	694.67	0	71.70	745.16
313	J-52	581,362.87	5,930,976.72	710.00	0	79.50	766.00
314	J-55	581,524.10	5,931,157.51	710.00	0.12	79.30	765.88
315	J-74	580,931.94	5,934,929.32	656.10	0	84.90	715.94
316	J-253	578,957.63	5,934,474.88	660.00	0.02	79.40	715.93
317	J-225	582,168.53	5,932,538.56	707.11	0	54.00	745.15
318	J-186	582,113.31	5,933,524.29	685.00	0	85.40	745.13
319	J-66	581,776.04	5,931,621.09	710.00	0	79.20	765.77
320	J-227	582,440.48	5,932,638.63	706.71	0.01	54.50	745.14
321	J-54	581,528.40	5,930,990.16	710.00	0.02	79.40	765.94
322	J-470	580,815.61	5,933,005.16	692.36	0	75.00	745.17
323	J-165	583,521.11	5,934,524.87	687.40	0	65.80	733.75
324	J-32	581,064.31	5,930,954.31	710.00	0.1	79.50	766.01
325	J-42	581,092.22	5,931,480.07	710.00	0.06	79.40	765.96
326	J-178	583,196.31	5,933,356.52	696.11	0.24	69.50	745.10
327	J-93	584,191.17	5,935,768.07	660.00	0.2	80.70	716.88
328	J-97	584,487.83	5,935,930.76	660.00	0.12	80.70	716.88
329	J-122	584,821.83	5,935,460.16	675.00	0.07	59.50	716.88
330	J-84	582,052.57	5,934,877.70	660.32	0.03	79.00	715.98
331	J-62	581,787.29	5,931,163.23	710.00	0	79.30	765.84

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
332	J-29	580,819.72	5,930,954.31	710.00	0.02	79.50	765.99
333	J-94	584,255.00	5,935,803.19	660.00	0	80.70	716.88
334	J-72	580,939.25	5,935,281.52	655.00	0.11	86.50	715.94
335	J-188	582,266.79	5,933,527.86	686.55	0	83.10	745.13
336	J-231	580,791.64	5,934,829.71	658.98	0	80.90	715.94
337	J-229	581,106.36	5,932,407.45	708.32	0.04	52.30	745.18
338	J-466	580,911.13	5,932,595.87	700.92	0	62.80	745.17
339	J-10	579,940.63	5,931,347.65	705.00	0.21	86.50	765.97
340	J-95	584,308.01	5,935,828.08	660.00	0.04	80.70	716.88
341	5 (Dumr	580,618.70	5,931,343.45	710.00	2.54	79.40	765.97
342	J-78	581,169.38	5,934,827.76	658.78	0	81.10	715.95
343	J-99	584,705.73	5,936,073.73	662.40	0.24	77.30	716.87
345	J-7	579,949.27	5,931,039.18	708.18	0	82.00	765.98
346	J-196	581,597.38	5,933,587.35	683.44	0.19	87.60	745.15
347	J-208	581,439.10	5,932,459.61	706.90	0.02	54.30	745.19
348	J-68	580,592.95	5,934,845.60	659.96	0.15	79.40	715.93
349	J-73	580,877.59	5,934,935.04	656.37	0.23	84.60	715.94
350	J-79	581,379.39	5,934,807.01	659.35	0	80.40	715.96
351	J-464	580,909.59	5,932,458.81	705.00	0	57.00	745.17
352	J-221	582,125.37	5,932,889.89	698.69	0	65.90	745.14
353	J-63	581,781.57	5,931,261.93	710.00	0.14	79.20	765.82
354	J-48	580,984.87	5,931,374.92	710.00	0	79.50	765.97
355	J-173	583,884.96	5,934,430.17	688.11	0.23	64.80	733.74
356	J-136	584,891.71	5,935,152.93	679.69	0	76.60	733.64
357	J-255	580,263.72	5,934,844.03	655.00	0.08	86.50	715.93
358	J-137	584,631.30	5,935,458.11	675.00	0.16	59.50	716.89
359	J-44	580,980.30	5,931,477.21	710.00	0	79.40	765.97
363	J-69	580,683.06	5,934,980.81	657.45	0.15	83.00	715.93
364	J-461	580,324.91	5,931,786.10	709.66	0.09	79.90	765.97
365	J-50	580,982.78	5,931,104.50	710.00	0	79.50	765.99
366	J-58	581,515.23	5,931,487.78	710.00	0.03	79.30	765.87
367	J-61	581,675.72	5,931,158.94	710.00	0.03	79.30	765.86
368	6 (Dumr	581,521.24	5,931,231.89	710.00	2.54	79.30	765.88
369	J-47	580,657.25	5,931,474.23	710.00	0.02	79.40	765.97
370	J-176	583,816.43	5,934,177.51	694.01	0.48	56.40	733.74
371	J-128	584,625.87	5,935,253.30	677.60	0.14	79.50	733.63
372	J-151	584,368.17	5,934,786.73	686.46	0.07	67.00	733.67
373	J-13	580,314.34	5,931,355.17	710.00	0.02	79.50	765.97
374	J-33	581,129.33	5,930,960.12	711.70	0.01	77.10	766.02
376	J-123	584,823.26	5,935,405.93	675.00	0.02	59.50	716.88
378	J-21	580,469.94	5,931,023.06	709.21	0.14	80.60	765.98
379	30 (Dum	582,732.45	5,933,277.32	694.69	2.54	71.60	745.11
380	J-202	581,938.04	5,933,230.80	691.08	0	76.70	745.14
381	J-168	583,530.88	5,933,486.18	696.64	0	68.80	745.09
382	J-49	580,979.92	5,931,250.39	710.00	0.14	79.50	765.98
383	J-110	584,991.94	5,935,799.82	669.94	0.16	66.60	716.87
384	J-102	585,009.28	5,936,277.18	663.86	0.1	75.30	716.87

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385	J-31	580,988.50	5,930,955.74	710.00	0	79.50	766.00
386	J-147	584,453.45	5,934,840.49	687.96	0	64.90	733.68
387	J-28	580,746.77	5,930,951.45	710.00	0	79.50	765.99
388	J-24	580,662.38	5,931,227.51	710.00	0.01	79.50	765.97
389	J-465	580,908.44	5,932,502.26	705.00	0	57.00	745.17
390	J-154	584,411.58	5,934,645.67	688.86	0.12	63.60	733.67
391	J-89	582,495.94	5,935,018.15	660.81	0.06	78.30	715.98
392	J-153	584,372.24	5,934,648.39	687.96	0.09	64.90	733.67
394	J-98	584,633.48	5,936,025.02	660.29	0.11	80.30	716.87
395	J-259	580,335.37	5,931,450.69	710.00	0.43	79.50	765.97
396	J-3	579,802.82	5,931,225.65	706.10	0.33	85.00	765.97
397	J-85	582,115.29	5,934,881.39	660.25	0	79.10	715.98
398	J-71	580,907.63	5,935,126.70	655.00	0.1	86.50	715.94
399	J-116	585,011.03	5,936,214.00	665.00	0.12	73.60	716.87
400	J-167	583,523.26	5,933,883.17	694.49	0	71.80	745.08
401	J-70	580,800.35	5,935,056.62	655.00	0.1	86.50	715.94
402	J-43	581,021.33	5,931,478.00	710.00	0	79.40	765.97
403	J-179	582,955.94	5,933,296.73	695.00	0	71.10	745.11
406	J-224	582,174.13	5,932,629.80	705.00	0.3	57.00	745.15
407	J-35	581,249.48	5,930,968.71	712.31	0	76.30	766.04
408	J-145	584,444.72	5,934,995.00	679.73	0	76.50	733.65
409	J-170	583,875.75	5,934,103.79	694.22	0	56.10	733.74
410	J-228	582,556.63	5,932,642.20	708.46	0.19	52.10	745.13
411	J-15	580,429.24	5,931,386.27	710.00	0.23	79.40	765.97
412	eson Zo	581,783.00	5,931,386.36	710.00	0.29	79.20	765.80
413	J-262	580,997.23	5,933,183.46	691.01	0	76.90	745.17
414	J-76	581,080.70	5,934,784.85	659.39	0	80.30	715.95
415	J-82	581,851.29	5,934,868.21	661.29	0	77.60	715.98
416	J-187	582,195.09	5,933,525.99	685.61	0.08	84.50	745.13
417	J-124	584,883.57	5,935,380.79	675.00	0	59.50	716.88
418	J-86	582,250.40	5,934,884.38	660.62	0.09	78.60	715.98
419	J-101	584,926.98	5,936,225.99	665.00	0.16	73.60	716.87
420	J-140	584,498.38	5,935,323.83	675.17	0.08	82.90	733.60
422	J-198	581,719.60	5,933,471.45	685.00	0.82	85.40	745.15
423	J-248	581,903.32	5,932,070.50	710.80	0	77.30	765.27
424	J-247	581,891.92	5,931,996.23	710.54	0	77.80	765.34
426	J-5	579,945.61	5,931,212.07	706.57	0	84.30	765.97
427	J-171	583,770.32	5,934,494.96	687.57	0.13	65.50	733.74
428	J-22	580,670.19	5,931,024.49	710.00	0.05	79.50	765.98
429	J-16	580,476.44	5,931,406.30	710.00	0	79.40	765.97
430	J-184	582,112.89	5,933,307.91	690.00	0.12	78.30	745.13
431	J-57	581,518.38	5,931,364.91	710.00	0.01	79.30	765.88
432	J-11	580,115.27	5,931,356.66	710.00	0.26	79.50	765.97
433	J-467	580,945.04	5,932,670.20	698.68	0.46	66.00	745.17
434	J-127	584,738.45	5,935,230.24	678.28	0.11	78.60	733.63
435	J-20	580,457.07	5,931,080.27	710.00	0.02	79.50	765.98
436	J-172	583,827.64	5,934,460.07	688.49	0.13	64.20	733.74

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437	J-157	584,429.91	5,934,843.88	686.75	0.06	66.60	733.69
438	J-161	583,932.31	5,934,795.27	682.13	0	73.20	733.72
439	J-114	584,722.31	5,935,766.42	668.89	0.01	68.10	716.88
440	J-149	584,407.51	5,934,758.25	688.05	0.06	64.70	733.67
441	akeshor	584,613.31	5,935,863.83	662.35	0.19	77.40	716.88
442	J-257	580,273.72	5,935,345.33	655.00	0.03	86.50	715.93
443	J-155	584,414.29	5,934,584.64	689.82	0.09	62.20	733.67
444	0 (Dumr	581,734.36	5,934,653.26	664.25	2.54	73.40	715.97
445	J-125	580,796.41	5,934,677.05	660.00	0.15	79.40	715.94
446	J-193	580,848.07	5,934,368.52	665.00	0.11	72.30	715.95
447	J-194	580,976.24	5,934,190.14	670.34	0.11	64.70	715.95
448	J-209	580,970.10	5,934,678.48	660.00	0.13	79.40	715.94
449	J-214	580,690.97	5,934,694.14	660.00	0	79.40	715.94
450	J-215	580,690.08	5,934,275.57	666.57	0	70.10	715.95
451	J-216	580,551.33	5,931,612.96	710.00	0	79.40	765.97
452	J-274	580,878.67	5,934,350.62	665.00	0	72.30	715.95
453	J-275	582,747.60	5,932,645.50	707.89	0.03	52.90	745.12
454	J-276	582,369.34	5,933,528.13	687.83	0.04	81.30	745.12
455	J-277	582,535.87	5,933,574.49	689.17	0.02	79.40	745.12
456	J-278	582,252.25	5,931,642.45	710.00	0	79.00	765.64
457	79 (Dum	582,429.55	5,931,644.90	712.34	2.54	75.70	765.64
458	J-280	582,657.75	5,931,650.26	715.00	0.78	71.90	765.64
460	J-317	582,199.34	5,932,409.79	709.00	0	51.30	745.15
461	preme S	579,529.45	5,930,618.12	710.00	0	79.40	765.97
462	J-369	580,329.98	5,930,530.83	711.57	0.09	77.20	765.98
463	J-413	584,962.80	5,935,893.67	667.76	0	69.70	716.87
464	J-414	580,992.55	5,933,333.24	690.00	0.02	78.30	745.16
465	J-415	580,322.26	5,930,836.93	709.65	0	80.00	765.98
466	J-416	580,996.56	5,933,257.52	690.00	0	78.30	745.16
467	J-417	581,409.37	5,930,749.49	710.00	0	79.60	766.05
468	J-418	581,473.62	5,930,748.31	710.00	0	79.60	766.05
469	J-426	581,027.60	5,931,617.03	710.00	0	79.40	765.95
470	J-427	581,474.51	5,931,632.42	711.07	0.36	77.80	765.86
472	J-433	581,230.40	5,931,623.34	710.40	0.04	78.80	765.94
473	J-455	585,032.66	5,934,913.17	682.73	0.03	72.30	733.64
474	J-456	584,578.32	5,935,458.14	674.14	0	60.70	716.89
475	J-457	584,473.57	5,935,561.72	668.91	0.06	68.10	716.89
476	J-458	584,552.88	5,935,630.17	668.40	0.03	68.80	716.89
477	J-459	584,630.33	5,935,622.09	670.00	0	66.60	716.89
478	J-460	584,399.04	5,935,479.51	669.91	0.05	66.70	716.89
479	J-462	584,407.26	5,935,625.71	666.69	0.02	71.20	716.88
480	J-473	584,318.20	5,935,632.34	665.00	0	73.60	716.88
481	J-474	580,907.43	5,933,564.98	687.95	0	81.20	745.16
482	J-475	584,394.68	5,934,582.93	689.24	0	63.10	733.67
483	J-476	584,378.97	5,934,558.28	688.81	0	63.70	733.67
484	J-477	584,385.26	5,934,422.76	691.17	0.14	60.30	733.67
485	J-478	584,452.79	5,934,337.14	695.00	0	54.90	733.67

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
486	J-479	584,456.37	5,934,203.11	695.00	0	54.90	733.67
487	J-480	584,346.35	5,934,199.50	695.00	0.06	54.90	733.67
488	untry Sq	584,451.06	5,934,432.27	692.57	0.01	58.30	733.67
489	J-482	584,501.53	5,934,435.28	693.17	0	57.50	733.67
490	J-483	582,554.17	5,934,938.61	661.50	0	77.30	715.98
491	J-484	580,257.71	5,934,709.77	655.00	0	86.50	715.93
492	J-485	580,164.03	5,934,700.83	655.00	0.04	86.50	715.93
493	Greenbria	580,160.09	5,934,602.78	655.28	0.14	86.10	715.93
494	J-487	580,157.19	5,934,461.58	658.62	0.05	81.30	715.93
495	J-488	580,264.39	5,934,426.70	660.00	0	79.40	715.93
496	J-489	580,262.15	5,934,273.16	662.79	0.03	75.40	715.93
497	J-490	580,263.09	5,934,169.52	664.93	0	72.40	715.93
498	J-491	580,263.09	5,934,052.82	668.12	0	67.90	715.93
499	J-492	580,603.96	5,933,233.91	687.77	0.06	81.50	745.17
500	J-493	580,285.22	5,933,229.98	685.12	0	85.20	745.16
501	J-494	580,019.98	5,933,222.44	681.92	0	89.80	745.16
502	J-496	579,846.07	5,933,216.09	683.33	0	87.80	745.16
503	J-497	579,558.48	5,933,207.86	680.78	0.65	91.40	745.16
504	J-498	579,384.04	5,933,248.61	680.76	0	91.40	745.16
505	J-499	580,585.32	5,935,532.59	655.00	0.12	86.50	715.93
506	J-500	580,800.29	5,934,469.04	664.91	0.1	72.40	715.94
507	Panatton	580,493.51	5,932,097.85	705.00	0.52	57.00	745.17
508	J-502	581,171.70	5,934,953.60	655.96	0.07	85.10	715.94
509	J-503	581,266.41	5,934,961.33	656.39	0.1	84.50	715.94
510	J-504	581,381.72	5,934,985.17	655.83	0.1	85.30	715.94
511	J-505	581,484.80	5,934,976.15	656.63	0.16	84.20	715.94
512	J-506	581,091.17	5,935,043.79	655.00	0.1	86.50	715.94
513	J-507	581,089.89	5,935,190.68	655.00	0.12	86.50	715.94
514	J-508	580,357.88	5,929,962.29	715.00	0	72.40	765.97
515	J-510	582,422.00	5,934,645.84	668.00	0	68.20	716.05
516	J-511	582,750.31	5,934,542.81	675.00	0	58.30	716.09
518	J-338	584,547.50	5,934,594.73	690.00	0	62.00	733.66
519	J-339	584,844.68	5,934,804.41	685.00	0.15	69.10	733.65
520	J-340	584,755.52	5,934,642.61	690.00	0.37	62.00	733.65
521	J-341	584,801.75	5,934,584.83	690.00	0	62.00	733.65
522	J-342	584,626.74	5,934,593.08	689.17	0	63.10	733.65
523	J-343	584,630.05	5,934,465.96	690.99	0.23	60.60	733.65
524	J-344	584,677.93	5,934,368.55	692.43	0	58.50	733.65
525	J-345	584,719.20	5,934,290.95	693.49	0.17	57.00	733.65
526	J-346	584,743.41	5,934,208.42	694.61	0	55.40	733.65
527	J-347	579,821.81	5,934,839.28	655.41	0	85.90	715.93
528	J-348	579,906.54	5,934,628.04	660.00	0.32	79.40	715.93
529	J-349	579,552.52	5,934,390.76	660.66	0.12	78.50	715.93
530	J-350	579,560.18	5,934,186.05	665.00	0	72.30	715.93
531	J-351	579,798.46	5,934,185.19	665.00	0	72.30	715.93
532	J-352	580,053.20	5,934,194.89	663.47	0	74.50	715.93
533	J-353	580,058.17	5,934,050.10	666.33	0	70.40	715.93

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
549	J-371	579,058.45	5,934,237.94	663.97	0	73.70	715.93
550	J-372	582,913.82	5,934,492.65	679.00	0	52.70	716.11
551	J-373	583,715.84	5,934,179.49	692.83	0	58.10	733.74
552	J-374	583,711.11	5,934,323.53	691.08	0	60.60	733.74
553	J-375	583,617.79	5,934,384.39	690.00	0	62.10	733.74
565	J-388	583,543.54	5,932,874.51	705.00	0	56.90	745.10
567	J-390	581,655.30	5,929,996.66	715.00	0.32	72.40	766.04
568	91 (Dum	580,970.38	5,929,997.16	715.00	2.54	72.40	765.98
569	J-392	580,813.36	5,929,007.00	720.00	0.05	65.20	765.95
570	J-393	581,663.98	5,929,028.48	715.00	16.89	72.30	765.94
593	J-424	581,660.97	5,929,623.62	713.50	0.1	74.50	766.00
594	J-425	581,665.24	5,929,366.79	715.00	0	72.30	765.96
602	J-437	584,749.37	5,934,767.29	686.86	0	66.40	733.65
614	J-449	581,421.38	5,932,595.83	704.53	0.79	57.70	745.18
615	J-450	579,529.68	5,930,833.39	710.00	0	79.40	765.97
616	J-451	582,718.01	5,933,794.15	686.82	0.29	82.70	745.11
617	J-452	584,568.62	5,934,437.45	692.38	0.26	58.60	733.65
618	J-453	584,709.29	5,934,821.05	685.00	0.24	69.10	733.65
619	J-454	578,967.63	5,931,180.10	705.00	0.32	86.50	765.97
621	J-481	579,912.34	5,929,983.06	710.05	0.43	79.40	765.97
623	J-495	581,742.29	5,930,634.26	710.00	0	79.60	766.05
624	J-514	581,024.45	5,930,758.71	710.00	0.17	79.50	766.03
1202	J-515	581,712.08	5,932,708.51	700.00	0.17	64.10	745.17
1205	J-516	581,669.94	5,929,192.84	715.00	0	72.30	765.94
1210	J-518	581,830.29	5,929,625.08	715.00	0	72.40	766.00
1212	J-519	581,835.07	5,929,999.06	715.66	0	71.50	766.04
1215	J-520	583,628.60	5,934,178.46	691.55	0	59.90	733.74
1217	J-521	579,709.90	5,934,475.78	661.19	0	77.70	715.93
1221	J-523	579,612.49	5,934,670.51	660.00	0	79.40	715.93
1223	J-524	579,458.36	5,934,392.85	660.00	0	79.40	715.93
1225	J-525	579,864.05	5,934,327.41	663.27	0	74.70	715.93
1247	J-529	581,722.82	5,930,546.21	711.81	0	77.00	766.05
1250	J-530	581,718.67	5,930,439.72	715.00	0	72.50	766.04
1252	J-531	581,695.54	5,930,265.84	715.00	0	72.50	766.04
1254	J-532	581,651.35	5,930,158.96	715.00	0	72.50	766.04
1261	J-535	580,317.76	5,932,082.48	705.00	0	57.00	745.17
1279	J-542	580,321.43	5,931,912.84	706.22	0	84.80	765.97
1303	J-550	579,304.34	5,931,106.29	705.49	0	85.90	765.97
1308	J-552	581,774.56	5,934,875.22	660.36	0.02	79.00	715.98
1310	J-553	584,830.76	5,934,337.70	691.53	0	59.80	733.65
1313	J-554	581,603.99	5,933,308.60	689.95	0	78.40	745.15
1317	J-555	581,321.58	5,933,537.76	685.33	0	84.90	745.15
1320	J-556	581,323.99	5,933,415.23	687.59	0	81.70	745.15
1322	J-557	581,250.04	5,933,467.96	686.55	0	83.20	745.15
1323	J-558	581,327.56	5,933,467.96	686.59	0	83.10	745.15
1330	J-560	584,062.95	5,933,663.17	698.76	0.44	65.80	745.09
1333	J-561	582,080.53	5,931,638.76	710.00	0	79.00	765.64

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1336	J-562	582,569.27	5,933,781.52	685.00	0.05	85.30	745.11
1339	J-563	583,023.88	5,933,806.52	689.56	0.99	78.80	745.09
1342	J-564	583,338.73	5,933,881.24	692.98	0	74.00	745.09
1345	J-565	582,744.06	5,932,889.49	701.99	0	61.20	745.12
1348	J-566	582,939.07	5,932,645.59	708.52	0.02	51.90	745.12
1351	J-567	583,002.33	5,932,556.57	709.00	0.05	51.30	745.12
1353	J-568	581,247.75	5,932,942.22	695.05	0	71.20	745.17
1356	J-569	580,577.37	5,932,096.86	705.31	0	56.60	745.17
1359	J-570	580,889.17	5,932,276.53	705.71	0	56.00	745.17
1362	J-571	580,880.65	5,932,177.12	706.82	0	54.40	745.17
1366	J-573	579,703.90	5,930,618.74	710.00	0.19	79.40	765.97
1369	J-574	579,904.79	5,930,431.14	710.00	0	79.40	765.97
1372	J-575	580,334.11	5,930,381.44	712.92	0	75.30	765.98
1375	J-576	581,433.82	5,929,694.07	715.00	1.67	72.40	765.99
1387	J-578	580,835.80	5,932,122.19	707.37	0	53.70	745.17
1390	J-579	579,380.19	5,933,203.20	681.18	0	90.80	745.16
1405	J-586	581,295.24	5,929,939.38	715.00	0.09	72.40	765.99
1452	J-602	579,239.65	5,934,831.22	656.38	0	84.50	715.93
1473	J-607	579,543.45	5,929,983.64	715.00	0	72.40	765.97
1475	J-608	580,203.48	5,929,958.96	713.28	0	74.80	765.97
1478	J-609	580,201.01	5,929,860.38	713.35	0	74.70	765.97
1480	J-610	580,552.48	5,929,989.36	715.00	0.71	72.40	765.98
1483	J-611	580,325.86	5,930,727.51	710.00	0	79.50	765.98
1499	J-613	584,353.40	5,933,669.57	695.76	0	70.00	745.09
1504	J-614	582,934.11	5,932,889.06	702.94	0	59.90	745.12
1556	J-628	580,375.92	5,929,164.92	717.44	0	68.90	765.96
1559	J-629	580,365.57	5,929,526.73	705.00	0	86.50	765.96
1619	J-634	580,375.70	5,929,000.34	718.77	0	67.00	765.95
1681	J-642	581,668.12	5,929,095.99	715.00	0	72.30	765.94
1741	J-647	581,271.30	5,929,015.97	720.00	0	65.20	765.94
1744	48 (Dum	581,275.92	5,928,657.02	720.00	2.54	65.20	765.94
1746	J-649	581,116.31	5,928,684.12	720.00	0	65.20	765.94
1748	J-650	581,110.60	5,929,012.69	721.17	0	63.50	765.94
1857	J-662	581,970.85	5,935,022.33	659.84	0	79.70	715.98
1859	J-663	582,116.21	5,935,056.50	657.14	0	83.50	715.98
1930	J-668	579,102.84	5,931,112.30	705.76	0	85.50	765.97
1949	J-675	579,907.29	5,930,219.27	710.00	0	79.40	765.97
1952	J-676	580,043.39	5,929,961.76	711.50	0	77.30	765.97
1965	J-682	578,966.18	5,934,323.21	662.52	0	75.80	715.93
1974	J-685	580,448.50	5,933,230.44	686.51	0	83.30	745.17
1980	J-687	580,334.63	5,930,185.02	714.34	0	73.30	765.97
1983	J-688	580,557.45	5,930,744.75	710.00	0	79.50	766.00
1986	J-689	581,209.13	5,929,990.60	715.00	0	72.40	765.99
1989	J-690	582,115.87	5,934,642.64	665.83	0	71.2	716.02
1995	J-692	580,367.90	5,935,411.75	655	0	86.5	715.93
1998	J-693	580,939.14	5,935,207.44	655	0	86.5	715.94
2001	J-694	581,593.23	5,933,015.33	699.23	0	65.2	745.16

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
2004	J-695	581,706.64	5,932,861.89	698.36	0	66.4	745.17
2009	J-697	580,594.61	5,929,003.29	722.94	0	61.1	765.95
2012	J-698	579,772.86	5,930,616.65	710	0	79.4	765.97
2015	J-699	581,656.96	5,929,786.31	715	0	72.4	766.02
2024	J-701	579,705.90	5,933,212.88	682	0	89.7	745.16
2048	J-709	584,218.05	5,933,682.14	696.07	0	69.6	745.09
2142	J-719	582,112.92	5,929,042.77	714.67	0	72.8	765.94
2145	J-720	581,900.54	5,929,036.19	714.83	0	72.5	765.94
2148	J-721	585,115.48	5,935,430.98	672.05	0	63.6	716.87
2153	J-723	581,364.59	5,933,637.12	683.4	0	87.7	745.15
2155	J-724	581,503.77	5,933,636.39	683.4	0	87.7	745.15
2157	J-725	581,505.07	5,933,898.96	680	0	92.5	745.15

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
654	P-120	J-102	J-116	63.00	200	120.00	0.00	0	0	0	PVC
655	P-156	J-147	J-148	80.00	200	120.00	3.10	0.1	0.007	0.086	PVC
656	P-78	J-73	J-74	58.00	200	120.00	-1.20	0.04	0.001	0.014	PVC
657	P-95	J-90	J-91	95.00	200	120.00	0.00	0	0	0	PVC
658	P-74	J-69	J-70	140.00	200	120.00	-1.40	0.04	0.003	0.02	PVC
659	P-201	J-191	J-192	96.00	300	120.00	0.00	0	0	0	PVC
660	P-5	J-5	J-7	173.00	200	120.00	-1.53	0.05	0.004	0.023	PVC
661	P-119	J-115	J-109	130.00	200	120.00	1.02	0.03	0.001	0.011	PVC
662	P-307(2)	J-471	J-470	147.00	300	120.00	-1.18	0.02	0	0.002	PVC
663	P-216	J-205	J-206	353.00	300	120.00	-7.15	0.1	0.015	0.056	PVC
664	P-124	J-119	J-110	95.00	200	120.00	0.33	0.01	0	0.001	PVC
665	P-17	J-17	J-18	122.00	300	110.00	-3.42	0.05	0.002	0.017	Asbestos Cement
666	P-11	J-11	J-12	113.00	300	120.00	-0.71	0.01	0	0.001	PVC
667	P-73	J-68	J-69	169.00	200	120.00	-1.25	0.04	0.003	0.016	PVC
668	P-235	J-223	J-224	98.00	300	120.00	-4.72	0.07	0.003	0.026	PVC
669	P-46	J-44	J-45	77.00	300	110.00	-1.72	0.02	0	0.004	Asbestos Cement
670	P-152	J-131	J-145	12.00	200	120.00	-3.26	0.1	0.001	0.096	PVC
671	P-141	J-134	J-135	126.00	150	120.00	0.71	0.04	0.003	0.023	PVC
672	P-30	J-28	J-29	73.00	300	110.00	-5.78	0.08	0.003	0.045	Asbestos Cement
673	P-195	J-185	J-186	131.00	300	120.00	4.18	0.06	0.003	0.021	PVC
674	P-306(2)	J-472	J-471	85.00	300	120.00	-1.18	0.02	0	0.003	PVC
675	P-215	J-204	J-205	197.00	300	120.00	-7.15	0.1	0.011	0.056	PVC
676	P-159	J-150	J-151	35.00	200	120.00	0.32	0.01	0	0	PVC
677	P-16	J-13	J-17	156.00	300	110.00	-3.42	0.05	0.003	0.017	Asbestos Cement
678	P-160	J-151	J-152	71.00	200	120.00	0.25	0.01	0	0.001	PVC
679	P-110	J-106	J-107	37.00	200	120.00	-0.09	0	0	0	PVC
680	P-10	J-10	J-11	167.00	300	120.00	-0.45	0.01	0	0	PVC
681	P-234	J-222	J-223	81.00	300	120.00	-4.71	0.07	0.002	0.025	PVC
682	P-72	J-67	J-58	158.00	300	110.00	-17.27	0.24	0.056	0.338	Asbestos Cement
683	P-135	J-128	J-129	126.00	150	120.00	0.77	0.04	0.003	0.027	PVC
684	P-26	J-25 (Dummy)	J-26	119.00	300	110.00	1.55	0.02	0.001	0.004	Asbestos Cement
685	P-172	J-162	J-163	145.00	300	120.00	-7.55	0.11	0.009	0.062	PVC
686	P-140	J-133	J-134	114.00	200	120.00	0.81	0.03	0.001	0.007	PVC
687	P-158	J-149	J-150	30.00	200	120.00	0.32	0.01	0	0.002	PVC
688	P-52	J-49	J-50	146.00	300	110.00	-6.43	0.09	0.008	0.054	Asbestos Cement
689	P-148	J-129	J-141	83.00	150	120.00	0.00	0	0	0	PVC
690	P-182	J-173	J-174	102.00	200	120.00	-0.31	0.01	0	0.001	PVC
691	P-282	J-252	J-253	357.00	300	120.00	0.02	0	0	0	PVC
692	P-217	J-206	J-207	75.00	300	120.00	-19.18	0.27	0.059	0.35	PVC
693	P-15	J-15	J-16	51.00	300	110.00	1.94	0.03	0	0.006	Asbestos Cement
694	P-109	J-99	J-106	76.00	200	120.00	0.01	0	0	0	PVC
695	P-142	J-135	J-136	88.00	200	120.00	1.31	0.04	0.002	0.018	PVC
696	P-181	J-172	J-173	65.00	200	120.00	-0.08	0	0	0	PVC
697	P-71	J-66	J-67	156.00	300	110.00	-17.26	0.24	0.05	0.338	Asbestos Cement
698	P-193	J-183	J-184	75.00	300	120.00	4.73	0.07	0.002	0.027	PVC
699	P-238	J-226	J-227	86.00	300	120.00	6.94	0.1	0.009	0.053	PVC
700	P-157	J-148	J-149	48.00	200	120.00	0.80	0.03	0	0.006	PVC
701	P-75	J-70	J-71	128.00	200	120.00	0.21	0.01	0	0.001	PVC
702	P-147	J-129	J-140	62.00	150	120.00	3.59	0.2	0.029	0.46	PVC
703	P-129	J-122	J-123	62.00	200	120.00	0.02	0	0	0	PVC
704	P-92	J-87	J-88	83.00	200	120.00	0.42	0.01	0	0.002	PVC
705	P-171	J-161	J-162	175.00	300	120.00	-7.55	0.11	0.011	0.063	PVC
706	P-206	J-196	J-197	78.00	300	120.00	1.16	0.02	0	0.002	PVC
707	P-45	J-43	J-44	40.00	300	110.00	-8.02	0.11	0.003	0.083	Asbestos Cement
708	P-258	PMP-101	J-234	2.00	150	120.00	17.23	0.98	0.017	8.409	PVC
709	P-276	J-248	J-211	11.00	300	120.00	30.71	0.43	0.023	0.838	PVC
710	P-189	J-179	J-180 (Dummy)	237.00	350	120.00	-7.35	0.08	0.006	0.028	PVC
711	P-33	J-31	J-32	76.00	300	110.00	-12.30	0.17	0.014	0.18	Asbestos Cement
712	P-84	J-79	J-80 (Dummy)	386.00	250	120.00	-3.33	0.07	0.013	0.033	PVC
713	P-255	PMP-104	J-237	2.00	250	120.00	0.00	0	0	0	PVC
714	P-29	J-27	J-28	77.00	300	110.00	-5.78	0.08	0.003	0.044	Asbestos Cement
715	P-118	J-114	J-115	108.00	200	120.00	1.08	0.03	0.001	0.012	PVC
716	P-9	J-5	J-10	137.00	200	120.00	-0.24	0.01	0	0.001	PVC
718	P-229	J-217	J-218	31.00	300	120.00	34.03	0.48	0.031	1.012	PVC
719	P-265	J-241	PMP-103	2.00	600	120.00	38.27	0.14	0	0.074	PVC
720	P-210	J-200	J-201	211.00	300	120.00	2.81	0.04	0.002	0.01	PVC
721	P-232	J-220	J-221	94.00	300	120.00	-4.71	0.07	0.002	0.026	PVC
722	P-32	J-30	J-31	86.00	300	110.00	-5.87	0.08	0.004	0.046	Asbestos Cement
723	P-108	J-96	J-105	160.00	200	120.00	0.18	0.01	0	0	PVC
724	P-133	J-126	J-127	125.00	150	120.00	1.14	0.06	0.007	0.055	PVC
725	P-174	J-164	J-165	87.00	300	120.00	-8.73	0.12	0.007	0.082	PVC
726	P-134	J-127	J-128	116.00	150	120.00	1.03	0.06	0.005	0.046	PVC
727	P-190	J-180 (Dummy)	J-181	119.00	350	120.00	-7.39	0.08	0.005	0.028	PVC
728	P-211	J-201	J-202	129.00	360	120.00	9.69	0.1	0.005	0.041	HDPE
729	P-300	OLD FIRE PUMP	J-265	145.00	300	120.00	0.00	0	0	0	PVC
730	P-144	J-122	J-137	191.00	200	120.00	-1.66	0.05	0.005	0.027	PVC
731	P-231	J-219	J-220	100.00	300	120.00	-4.42	0.06	0.002	0.023	PVC
732	P-70	J-65	J-66	106.00	300	110.00	11.17	0.16	0.017	0.151	Asbestos Cement
733	P-35	J-33	J-34	60.00	300	110.00	-12.41	0.18	0.01	0.183	Asbestos Cement
734	P-117	J-113	J-114	51.00	200	120.00	-0.43	0.01	0	0.003	PVC
735	P-184	J-175	J-177	34.00	200	120.00	-0.52	0.02	0	0.004	PVC
736	P-112	J-108	J-109	88.00	200	120.00	-0.14	0	0	0	PVC
737	P-150	J-141	J-143	23.00	150	120.00	0.00	0	0	0	PVC
738	P-177	J-167	J-168	458.00	300	120.00	-4.38	0.06	0.009	0.023	PVC
739	P-115	J-97	Lakeshore	143.00	200	120.00	-0.24	0.01	0	0.001	PVC
740	P-192	J-182	J-183	257.00	350	120.00	-9.30	0.1	0.011	0.043	PVC
741	P-251	J-235	J-236	2.00	400	120.00	34.47	0.27	0	0.223	PVC
742	P-68	J-63	Acheson Zone 3	124.00	300	110.00	11.46	0.16	0.02	0.159	Asbestos Cement
743	P-309	J-469	J-468 (Dummy)	89.00	300	120.00	-1.18	0.02	0	0.002	PVC
744	P-146	J-128	J-139	63.00	150	120.00	0.12	0.01	0	0.001	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
745	P-97	J-93	J-94	73.00	200	120.00	-0.20	0.01	0	0.001	PVC
746	P-237	J-224	J-226	96.00	300	120.00	7.01	0.1	0.005	0.054	PVC
747	P-128	J-121	J-122	38.00	200	120.00	-1.57	0.05	0.001	0.024	PVC
748	P-22	J-21	J-22	200.00	300	110.00	-1.50	0.02	0.001	0.003	Asbestos Cement
749	P-122	J-117	J-118	130.00	200	120.00	-0.25	0.01	0	0.001	PVC
750	P-230	J-183	J-219	149.00	300	120.00	-4.33	0.06	0.003	0.022	PVC
751	P-104	J-100	J-101	111.00	200	120.00	0.38	0.01	0	0.001	PVC
753	P-61	J-57	J-58	116.00	300	110.00	3.51	0.05	0.002	0.018	Asbestos Cement
754	P-126	J-114	J-120	75.00	200	120.00	-1.52	0.05	0.002	0.023	PVC
755	P-28	J-22	J-27	72.00	300	110.00	-5.69	0.08	0.003	0.044	Asbestos Cement
756	P-44	J-42	J-43	77.00	300	110.00	-8.02	0.11	0.006	0.082	Asbestos Cement
757	P-197	J-187	J-188	74.00	300	120.00	4.10	0.06	0.001	0.02	PVC
758	P-20	J-19	J-20	49.00	300	110.00	-1.34	0.02	0	0.003	Asbestos Cement
759	P-80	J-75	J-76	179.00	200	120.00	-1.85	0.06	0.006	0.033	PVC
760	P-261	J-241	J-242	2.00	600	120.00	34.47	0.12	0	0.037	PVC
761	P-298	J-234	J-265	2.00	300	120.00	0.00	0	0	0	PVC
762	P-102	J-98	J-99	87.00	200	120.00	0.83	0.03	0.001	0.007	PVC
763	P-254	J-238	PMP-105	2.00	250	120.00	0.00	0	0	0	PVC
764	P-291	J-192	J-264	218.00	300	120.00	0.40	0.01	0	0	PVC
765	P-281	J-14	J-259	44.00	300	120.00	0.52	0.01	0	0	PVC
766	P-64	J-60	J-40	31.00	300	110.00	-16.05	0.23	0.01	0.296	Asbestos Cement
767	P-3	J-3	J-4	65.00	300	120.00	-1.77	0.03	0	0.004	PVC
768	P-83	J-78	J-79	214.00	250	120.00	-3.33	0.07	0.007	0.033	PVC
769	P-14	J-14	J-15	120.00	300	110.00	2.17	0.03	0.001	0.007	Asbestos Cement
770	P-58	J-54	J-55	167.00	300	110.00	17.81	0.25	0.06	0.359	Asbestos Cement
771	P-55	J-51	J-52	57.00	300	110.00	17.95	0.25	0.019	0.365	Asbestos Cement
772	P-167	J-157	J-158	22.00	250	120.00	-7.55	0.15	0.003	0.15	PVC
773	P-137	J-130	J-131	98.00	200	120.00	-3.12	0.1	0.009	0.087	PVC
774	P-105	J-101	J-102	98.00	200	120.00	0.22	0.01	0	0.001	PVC
775	P-101	J-97	J-98	173.00	200	120.00	0.94	0.03	0.002	0.01	PVC
776	P-188	J-178	J-179	247.00	350	120.00	-7.35	0.08	0.007	0.028	PVC
777	P-228	J-217	J-66	67.00	300	120.00	-34.03	0.48	0.064	1.013	PVC
778	P-38	J-36	J-37	94.00	300	110.00	12.55	0.18	0.018	0.187	Asbestos Cement
779	P-41	J-39	J-40	154.00	300	110.00	12.52	0.18	0.03	0.187	Asbestos Cement
780	P-154	J-145	J-146	133.00	200	120.00	-4.39	0.14	0.021	0.164	PVC
781	P-63	J-59	J-60	123.00	300	110.00	-16.05	0.23	0.035	0.295	Asbestos Cement
782	P-164	J-149	J-156	36.00	200	120.00	0.42	0.01	0	0.002	PVC
784	P-287	J-257	J-255	556.00	200	120.00	-0.25	0.01	0	0.001	HDPE
785	P-59	J-55	J-56 (Dummy)	74.00	300	110.00	6.06	0.09	0.004	0.049	Asbestos Cement
786	P-243	J-231	J-73	144.00	200	120.00	0.74	0.02	0.001	0.006	PVC
787	P-264	J-242	PMP-102	2.00	600	120.00	17.23	0.06	0	0.037	PVC
788	P-7	J-7	J-8	371.00	300	120.00	-1.56	0.02	0.001	0.003	PVC
789	P-268	R-1	J-239	2.00	600	120.00	72.73	0.26	0	0.149	PVC
790	P-88	J-83	J-84	56.00	200	120.00	0.63	0.02	0	0.004	PVC
791	P-121	J-116	J-117	92.00	200	120.00	-0.12	0	0	0	PVC
792	P-79	J-74	J-75	142.00	200	120.00	-1.20	0.04	0.002	0.015	PVC
793	P-24	J-23	J-24	158.00	300	110.00	4.10	0.06	0.004	0.024	Asbestos Cement
794	P-47	J-45	J-46	103.00	300	110.00	-1.80	0.03	0.001	0.005	Asbestos Cement
795	P-31	J-29	J-30	83.00	300	110.00	-5.80	0.08	0.004	0.045	Asbestos Cement
796	P-196	J-186	J-187	92.00	300	120.00	4.18	0.06	0.002	0.021	PVC
797	P-107	J-94	J-104	107.00	200	120.00	-1.35	0.04	0.002	0.018	PVC
799	P-161	J-152	J-153	68.00	200	120.00	0.51	0.02	0	0.003	PVC
800	P-250	J-234	J-235	2.00	400	120.00	17.23	0.14	0	0.074	PVC
801	P-136	J-129	J-130	187.00	200	120.00	-3.02	0.1	0.015	0.082	PVC
802	P-27	J-26	J-16	95.00	300	110.00	-1.94	0.03	0.001	0.006	Asbestos Cement
803	P-173	J-163	J-164	99.00	300	120.00	-7.73	0.11	0.006	0.065	PVC
804	P-66	J-61	J-62	112.00	300	110.00	11.60	0.16	0.018	0.162	Asbestos Cement
805	P-284	J-68	J-255	311.00	200	120.00	1.10	0.04	0.004	0.013	HDPE
806	P-257	PMP-102	J-235	2.00	150	120.00	17.23	0.98	0.017	8.409	PVC
807	P-218	J-207	J-208	408.00	300	120.00	11.38	0.16	0.058	0.133	PVC
808	P-239	J-227	J-228	96.00	300	120.00	6.93	0.1	0.006	0.053	PVC
809	P-18	J-18	J-8	31.00	300	110.00	-2.08	0.03	0	0.007	Asbestos Cement
811	P-130	J-123	J-124	65.00	200	120.00	0.00	0	0	0	PVC
812	P-143	J-136	J-126	89.00	200	120.00	1.31	0.04	0.002	0.017	PVC
813	P-93	J-88	J-89	68.00	200	120.00	0.25	0.01	0	0.001	PVC
814	P-207	J-197	J-198	121.00	300	120.00	0.84	0.01	0	0.001	PVC
815	P-149	J-141	J-142	40.00	150	120.00	0.00	0	0	0	PVC
816	P-259	J-239	J-240	2.00	600	120.00	72.73	0.26	0	0.149	PVC
817	P-34	J-32	J-33	60.00	300	110.00	-12.40	0.18	0.012	0.184	Asbestos Cement
818	P-85	J-80 (Dummy)	J-81	125.00	250	120.00	-5.87	0.12	0.012	0.095	PVC
819	P-256	PMP-103	J-236	2.00	200	120.00	38.27	1.22	0.018	9.041	PVC
820	P-183	J-174	J-175	119.00	200	120.00	-0.44	0.01	0	0.003	PVC
821	P-266	J-240	PMP-104	2.00	600	120.00	0.00	0	0	0	PVC
822	P-111	J-107	J-108	99.00	200	120.00	-0.09	0	0	0	PVC
823	P-308(2)	J-470	J-469	207.00	300	120.00	-1.18	0.02	0	0.002	PVC
824	P-233	J-221	J-222	79.00	300	120.00	-4.71	0.07	0.002	0.026	PVC
825	P-175	J-165	J-166	352.00	300	120.00	-15.25	0.22	0.068	0.229	PVC
826	P-53	J-50	J-31	149.00	300	110.00	-6.43	0.09	0.008	0.055	Asbestos Cement
827	P-96	J-86	J-92	190.00	200	120.00	0.09	0	0	0	PVC
828	P-191	J-181	J-182	234.00	350	120.00	-8.08	0.08	0.006	0.034	PVC
831	P-145	J-138	J-128	73.00	150	120.00	0.00	0	0	0	PVC
832	P-273	J-218	J-246	35.00	300	120.00	34.03	0.48	0.03	1.011	PVC
833	P-185	J-177	J-170	76.00	200	120.00	0.00	0	0	0	PVC
834	P-213	J-201	J-203	142.00	300	120.00	-6.88	0.1	0.008	0.052	PVC
835	P-114	J-110	J-111	107.00	200	120.00	0.17	0.01	0	0.001	PVC
836	P-178	J-168	J-169	64.00	300	120.00	-4.14	0.06	0.003	0.02	PVC
837	P-151	J-143	J-144	26.00	150	120.00	0.00	0	0	0	PVC
838	P-67	J-62	J-63	99.00	300	110.00	11.60	0.16	0.016	0.162	Asbestos Cement
839	P-310(2)	J-468 (Dummy)	J-467	69.00	300	120.00	-3.72	0.05	0.001	0.016	PVC
840	P-42	J-40	J-41	91.00	300	110.00	-7.91	0.11	0.007	0.079	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
841	P-123	J-109	J-119	21.00	200	120.00	0.78	0.02	0	0.007	PVC
842	P-12	J-12	J-13	89.00	300	120.00	-0.71	0.01	0	0.001	PVC
843	P-127	J-120	J-121	205.00	200	120.00	-1.52	0.05	0.005	0.023	PVC
844	P-39	J-37	J-38	110.00	300	110.00	12.54	0.18	0.021	0.187	Asbestos Cement
845	P-198	J-76	J-189	340.00	250	120.00	1.48	0.03	0.002	0.007	PVC
846	P-21	J-20	J-21	62.00	300	110.00	-1.36	0.02	0	0.004	Asbestos Cement
847	P-252	J-236	J-237	2.00	400	120.00	72.73	0.58	0.002	1.042	PVC
848	P-81	J-76	J-77	87.00	250	120.00	-3.33	0.07	0.003	0.033	PVC
849	P-293	J-264	J-261	179.00	300	120.00	-1.87	0.03	0.001	0.005	PVC
850	P-236	J-224	J-225	82.00	300	120.00	0.00	0	0	0	PVC
851	P-69	Acheson Zone 3	J-65	123.00	300	110.00	11.17	0.16	0.019	0.15	Asbestos Cement
852	P-65	J-55	J-61	151.00	300	110.00	11.63	0.16	0.025	0.163	Asbestos Cement
853	P-4	J-4	J-5	124.00	300	120.00	-1.77	0.03	0.001	0.004	PVC
854	P-168	J-158	J-159	265.00	300	120.00	-7.55	0.11	0.017	0.062	PVC
855	P-56	J-52	J-53	70.00	300	110.00	17.95	0.25	0.027	0.363	Asbestos Cement
856	P-139	J-132	J-133	106.00	200	120.00	1.04	0.03	0.001	0.011	PVC
857	P-36	J-34	J-35	61.00	300	110.00	-12.41	0.18	0.012	0.184	Asbestos Cement
858	P-103	J-99	J-100	157.00	200	120.00	0.58	0.02	0.001	0.004	PVC
859	P-98	J-94	J-95	59.00	200	120.00	1.15	0.04	0.001	0.014	PVC
860	P-116	Lakeshore	J-113	107.00	200	120.00	-0.43	0.01	0	0.002	PVC
861	P-305(2)	J-262	J-472	275.00	300	120.00	-0.47	0.01	0	0	PVC
863	P-165	J-156	J-152	29.00	200	120.00	0.42	0.01	0	0.003	PVC
864	P-221	J-210	J-211	208.00	300	120.00	-30.71	0.43	0.174	0.837	PVC
865	P-60	J-56 (Dummy)	J-57	133.00	300	110.00	3.52	0.05	0.002	0.017	Asbestos Cement
866	P-244	J-135	J-232	151.00	200	120.00	-0.83	0.03	0.001	0.008	PVC
867	P-106	J-102	J-103	82.00	200	120.00	0.12	0	0	0	PVC
868	P-269	J-35	J-244	73.00	350	120.00	-43.16	0.45	0.018	0.742	PVC
869	P-89	J-84	J-85	64.00	200	120.00	0.60	0.02	0	0.004	PVC
870	P-25	J-24	J-25 (Dummy)	124.00	300	110.00	4.09	0.06	0.003	0.023	Asbestos Cement
871	P-23	J-22	J-23	47.00	300	110.00	4.14	0.06	0.001	0.023	Asbestos Cement
872	P-37	J-35	J-36	106.00	300	110.00	12.55	0.18	0.02	0.188	Asbestos Cement
873	P-43	J-41	J-42	45.00	300	110.00	-7.96	0.11	0.004	0.081	Asbestos Cement
874	P-19	J-18	J-19	89.00	300	110.00	-1.34	0.02	0	0.003	Asbestos Cement
876	P-77	J-70	J-73	144.00	200	120.00	-1.71	0.05	0.004	0.029	PVC
877	P-94	J-89	J-90	141.00	200	120.00	0.19	0.01	0	0.001	PVC
878	P-260	J-240	J-241	2.00	600	120.00	72.73	0.26	0	0.112	PVC
879	P-267	J-239	PMP-105	2.00	600	120.00	0.00	0	0	0	PVC
880	P-297	J-243	OLD FIRE PUMP	4.00	500	120.00	0.00	0	0	0	PVC
881	P-253	J-237	J-238	2.00	400	120.00	72.73	0.58	0.002	1.005	PVC
882	P-186	J-176	J-177	48.00	200	120.00	0.52	0.02	0	0.003	PVC
883	P-86	J-81	J-82	220.00	200	120.00	0.65	0.02	0.001	0.005	PVC
884	P-274	J-246	J-247	370.00	300	120.00	30.71	0.43	0.307	0.837	PVC
885	P-214	J-203	J-204	29.00	300	120.00	-7.15	0.1	0.002	0.058	PVC
886	P-311(2)	J-467	J-466	82.00	300	120.00	-4.18	0.06	0.002	0.021	PVC
887	P-194	J-184	J-185	66.00	300	120.00	4.61	0.07	0.002	0.024	PVC
888	P-40	J-38	J-39	44.00	300	110.00	12.52	0.18	0.008	0.186	Asbestos Cement
889	P-199	J-189	J-190	318.00	300	120.00	0.00	0	0	0	PVC
890	P-162	J-153	J-154	39.00	200	120.00	0.42	0.01	0	0.002	PVC
891	P-82	J-77	J-78	43.00	250	120.00	-3.33	0.07	0.001	0.035	PVC
892	P-54	J-35	J-51	62.00	300	110.00	18.19	0.26	0.023	0.373	Asbestos Cement
893	P-57	J-53	J-54	91.00	300	110.00	17.83	0.25	0.033	0.359	Asbestos Cement
894	P-99	J-95	J-96	66.00	200	120.00	1.11	0.04	0.001	0.012	PVC
895	P-166	J-147	J-157	23.00	200	120.00	-7.49	0.24	0.011	0.444	PVC
896	P-222	J-211	J-212	47.00	300	120.00	0.00	0	0	0	PVC
897	P-245	J-133	J-233	76.00	200	120.00	0.14	0	0	0.001	PVC
898	P-1	J-1	J-2	158.00	300	120.00	-1.03	0.01	0	0.001	PVC
899	P-90	J-85	J-86	140.00	200	120.00	0.60	0.02	0.001	0.004	PVC
900	P-13	J-13	J-14	30.00	300	110.00	2.69	0.04	0.001	0.011	Asbestos Cement
901	P-48	J-46	J-47	139.00	300	110.00	-1.80	0.03	0.001	0.005	Asbestos Cement
903	P-155	J-146	J-147	23.00	200	120.00	-4.39	0.14	0.004	0.164	PVC
904	P-302(2)	J-259	J-461	628.00	300	120.00	0.09	0	0	0	PVC
905	P-240	J-208	J-230	357.00	300	120.00	4.74	0.07	0.009	0.026	PVC
906	P-187	J-168	J-178	363.00	350	120.00	-7.11	0.07	0.009	0.026	PVC
907	P-262	J-242	J-243	2.00	600	120.00	17.23	0.06	0	0.037	PVC
908	P-275	J-247	J-248	75.00	300	120.00	30.71	0.43	0.063	0.837	PVC
909	P-312(2)	J-466	J-465	94.00	300	120.00	-4.18	0.06	0.002	0.021	PVC
910	P-153	J-145	J-132	114.00	200	120.00	1.13	0.04	0.002	0.014	PVC
911	P-62	J-58	J-59	127.00	300	110.00	-13.78	0.19	0.029	0.223	Asbestos Cement
912	P-163	J-154	J-155	61.00	200	120.00	0.30	0.01	0	0.001	PVC
913	P-208	J-198	J-199	68.00	300	120.00	0.02	0	0	0	PVC
914	P-100	J-96	J-97	141.00	200	120.00	0.82	0.03	0.001	0.007	PVC
915	P-91	J-86	J-87	166.00	200	120.00	0.42	0.01	0	0.002	PVC
916	P-49	J-47	J-26	98.00	300	110.00	-1.82	0.03	0.001	0.005	Asbestos Cement
917	P-314(2)	J-464	J-230	207.00	300	120.00	-4.70	0.07	0.005	0.026	PVC
918	P-242	J-229	J-230	45.00	250	120.00	-0.04	0	0	0	PVC
919	P-6	J-7	J-6	24.00	200	120.00	0.03	0	0	0	PVC
920	P-263	J-243	PMP-101	2.00	600	120.00	17.23	0.06	0	0	PVC
921	P-2	J-2	J-3	142.00	300	120.00	-1.44	0.02	0	0.003	PVC
922	P-180	J-171	J-172	67.00	200	120.00	0.05	0	0	0	PVC
923	P-50	J-44	J-48	97.00	300	110.00	-6.29	0.09	0.005	0.052	Asbestos Cement
924	P-169	J-159	J-160	124.00	300	120.00	-7.55	0.11	0.008	0.062	PVC
925	P-315(2)	J-465	J-464	45.00	300	120.00	-4.18	0.06	0.001	0.022	PVC
926	P-87	J-82	J-83	149.00	200	120.00	0.63	0.02	0.001	0.004	PVC
927	P-51	J-48	J-49	123.00	300	110.00	-6.29	0.09	0.007	0.053	Asbestos Cement
928	P-170	J-160	J-161	104.00	300	120.00	-7.55	0.11	0.006	0.062	PVC
929	P-179	J-163	J-171	113.00	200	120.00	0.18	0.01	0	0	PVC
930	P-113	J-231	J-125	185.00	200	120.00	-0.74	0.02	0.001	0.006	PVC
931	P-203	J-125	J-209	180.00	200	120.00	0.13	0	0	0	PVC
932	P-204	J-125	J-214	107.00	200	120.00	0.00	0	0	0	PVC
933	P-205	J-193	J-215	201.00	300	120.00	0.00	0	0	0	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
934	P-219	J-26	J-216	167.00	200	110.00	1.64	0.05	0.005	0.031	Asbestos Cement
935	P-303	J-193	J-274	39.00	300	120.00	-1.23	0.02	0	0.002	PVC
936	P-305	J-274	J-194	198.00	200	120.00	0.11	0	0	0	PVC
937	P-306	J-189	J-274	249.00	300	120.00	1.34	0.02	0.001	0.002	PVC
938	P-307	J-228	J-275	314.00	300	120.00	6.74	0.1	0.01	0.05	PVC
940	P-310	J-188	J-276	110.00	300	120.00	4.10	0.06	0.002	0.02	PVC
941	P-311	J-276	J-182	265.00	300	120.00	-1.08	0.02	0.001	0.002	PVC
942	P-312	J-276	J-277	170.00	300	120.00	5.14	0.07	0.005	0.03	PVC
944	P-314	J-278	J-279 (Dummy)	172.00	300	120.00	3.32	0.05	0.002	0.014	PVC
945	P-315	J-279 (Dummy)	J-280	255.00	300	120.00	0.78	0.01	0	0.001	PVC
946	P-413	J-369	J-9	217.00	300	120.00	-3.75	0.05	0.003	0.017	PVC
947	P-463	J-119	J-413	36.00	150	120.00	0.45	0.03	0	0.01	PVC
948	P-464	J-413	J-118	118.00	200	120.00	0.45	0.01	0	0.002	PVC
949	P-466	J-414	J-263	264.00	300	120.00	4.10	0.06	0.004	0.02	PVC
950	P-467	J-8	J-415	209.00	300	120.00	-3.77	0.05	0.004	0.017	PVC
952	P-469	J-262	J-416	50.00	300	120.00	4.12	0.06	0.001	0.02	PVC
953	P-470	J-416	J-414	71.00	300	120.00	4.12	0.06	0.002	0.021	PVC
954	P-471	J-244	J-417	188.00	600	120.00	29.57	0.1	0.009	0.027	HDPE
955	P-472	J-417	J-418	70.00	600	120.00	21.84	0.08	0.001	0.015	PVC
956	P-483	J-216	J-426	467.00	200	110.00	1.64	0.05	0.015	0.031	Asbestos Cement
957	P-485	J-427	J-66	310.00	200	110.00	5.61	0.18	0.092	0.304	Asbestos Cement
958	P-491	R-3	J-432	2.00	350	120.00	0.00	0	0	0	PVC
959	P-492	J-432	PMP-1	2.00	350	120.00	0.00	0	0	0	PVC
960	P-493	PMP-1	J-281	2.00	350	120.00	0.00	0	0	0	PVC
961	P-494	J-238	PRV-4	3.00	350	120.00	72.73	0.76	0.006	1.953	PVC
962	P-495	PRV-4	J-244	3.00	350	120.00	72.73	0.76	0.006	1.953	PVC
963	P-496	PRV-5	J-280	37.00	400	120.00	0.00	0	0	0	PVC
964	P-497	J-281	PRV-5	2.00	400	120.00	0.00	0	0	0	PVC
965	P-500	J-433	J-427	244.00	200	110.00	5.97	0.19	0.083	0.341	Asbestos Cement
966	P-501	J-40	J-433	147.00	300	110.00	4.37	0.06	0.004	0.026	Asbestos Cement
967	P-502	J-225	J-317	106.00	300	120.00	0.00	0	0	0	PVC
968	P-529	J-461	J-542	318.00	300	120.00	0.00	0	0	0	PVC
971	P-536	J-202	J-183	115.00	350	120.00	9.69	0.1	0.008	0.046	PVC
972	P-597	J-232	J-455	163.00	200	120.00	0.03	0	0	0	PVC
973	P-598	J-137	J-456	53.00	200	120.00	-1.82	0.06	0.002	0.032	PVC
974	P-599	J-456	J-457	147.00	200	120.00	1.69	0.05	0.004	0.028	PVC
975	P-600	J-457	J-458	105.00	200	120.00	0.03	0	0	0	PVC
976	P-601	J-458	J-459	75.00	200	120.00	0.00	0	0	0	PVC
977	P-602	J-457	J-460	112.00	200	120.00	0.05	0	0	0	PVC
978	P-603	J-457	J-462	99.00	200	120.00	1.55	0.05	0.002	0.024	PVC
979	P-604	J-462	J-473	83.00	200	120.00	1.53	0.05	0.002	0.023	PVC
982	P-607	J-263	J-261	199.00	300	120.00	4.10	0.06	0.004	0.02	PVC
983	P-608	J-263	J-474	104.00	300	120.00	0.00	0	0	0	PVC
984	P-609	J-155	J-475	48.00	200	120.00	0.21	0.01	0	0	PVC
985	P-610	J-475	J-476	99.00	200	120.00	0.21	0.01	0	0	PVC
986	P-611	J-476	J-477	118.00	200	120.00	0.21	0.01	0	0.001	PVC
987	P-612	J-477	J-478	106.00	200	120.00	0.07	0	0	0	PVC
988	P-613	J-478	J-479	100.00	200	120.00	0.06	0	0	0	PVC
989	P-614	J-479	J-480	106.00	200	120.00	0.06	0	0	0	PVC
990	P-615	J-478	Country Squire	134.00	200	120.00	0.01	0	0	0	PVC
991	P-616	Country Squire	J-482	51.00	200	120.00	0.00	0	0	0	PVC
992	P-617	J-483	J-88	77.00	200	120.00	0.00	0	0	0	PVC
993	P-618	J-255	J-484	74.00	300	120.00	0.43	0.01	0	0.001	PVC
994	P-619	J-484	J-485	90.00	300	120.00	0.43	0.01	0	0	PVC
995	P-620	J-485	Greenbriar	149.00	300	120.00	0.39	0.01	0	0.001	PVC
996	P-621	Greenbriar	J-487	95.00	300	120.00	0.25	0	0	0	PVC
997	P-622	J-487	J-488	146.00	300	120.00	0.20	0	0	0	PVC
998	P-623	J-488	J-489	137.00	300	120.00	0.20	0	0	0	PVC
999	P-624	J-489	J-490	161.00	300	120.00	0.17	0	0	0	PVC
1000	P-625	J-490	J-491	59.00	300	120.00	0.17	0	0	0	PVC
1001	P-626	J-472	J-492	200.00	300	120.00	0.71	0.01	0	0	PVC
1003	P-628	J-493	J-494	221.00	300	120.00	0.65	0.01	0	0.001	PVC
1004	P-631	J-496	J-701	290.00	300	120.00	0.65	0.01	0	0.001	PVC
1006	P-633	J-494	J-496	395.00	300	120.00	0.65	0.01	0	0	PVC
1007	P-634	J-256	J-499	159.00	200	120.00	0.12	0	0	0	HDPE
1008	P-635	J-125	J-500	208.00	200	120.00	-1.02	0.03	0.002	0.011	PVC
1009	P-636	J-500	J-193	123.00	200	120.00	-1.12	0.04	0.002	0.013	PVC
1012	P-639	J-75	J-502	104.00	200	120.00	0.43	0.01	0	0.002	PVC
1013	P-640	J-502	J-503	95.00	200	120.00	0.36	0.01	0	0.002	PVC
1014	P-641	J-503	J-504	118.00	200	120.00	0.26	0.01	0	0.001	PVC
1015	P-642	J-504	J-505	103.00	200	120.00	0.16	0.01	0	0	PVC
1016	P-643	J-75	J-506	84.00	200	120.00	0.22	0.01	0	0.001	PVC
1017	P-644	J-506	J-507	147.00	200	120.00	0.12	0	0	0	PVC
1018	P-533	J-426	J-433	198.00	200	110.00	1.64	0.05	0.006	0.031	Asbestos Cement
1021	P-439	J-513	J-167	152.00	300	120.00	-15.25	0.22	0.028	0.229	HDPE
1023	P-441	J-148	J-338	252.00	200	120.00	2.28	0.07	0.012	0.049	PVC
1024	P-443	J-339	J-232	126.00	200	120.00	0.86	0.03	0.001	0.008	PVC
1025	P-445	J-340	J-341	74.00	200	120.00	0.00	0	0	0	PVC
1026	P-446	J-338	J-342	79.00	200	120.00	2.28	0.07	0.004	0.049	PVC
1027	P-447	J-342	J-340	138.00	200	120.00	1.62	0.05	0.004	0.026	PVC
1028	P-448	J-342	J-343	127.00	200	120.00	0.66	0.02	0.001	0.005	PVC
1029	P-449	J-343	J-344	109.00	200	120.00	0.17	0.01	0	0.001	PVC
1030	P-450	J-344	J-345	88.00	200	120.00	0.17	0.01	0	0	PVC
1031	P-451	J-345	J-346	107.00	200	120.00	0.00	0	0	0	PVC
1032	P-452	J-255	J-347	531.00	300	120.00	0.34	0	0	0	PVC
1034	P-454	J-347	J-348	255.00	200	120.00	0.27	0.01	0	0.001	PVC
1036	P-456	J-349	J-350	241.00	250	120.00	-0.17	0	0	0	PVC
1037	P-457	J-350	J-351	254.00	250	120.00	-0.17	0	0	0	PVC
1038	P-458	J-351	J-352	307.00	250	120.00	-0.17	0	0	0	PVC
1039	P-459	J-352	J-353	190.00	250	120.00	-0.17	0	0	0	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1040	P-460	J-353	J-491	195.00	250	120.00	-0.17	0	0	0	PVC
1057	P-499	J-511	J-372	586.00	250	120.00	-6.52	0.13	0.02	0.115	PVC
1058	P-504	J-176	J-373	101.00	200	120.00	-1.00	0.03	0.001	0.01	PVC
1059	P-505	J-373	J-374	144.00	200	120.00	-1.00	0.03	0.002	0.011	PVC
1060	P-506	J-374	J-375	147.00	200	120.00	-1.00	0.03	0.002	0.011	PVC
1061	P-507	J-375	J-164	158.00	200	120.00	-1.00	0.03	0.002	0.01	PVC
1069	P-517	J-473	J-104	80.00	200	120.00	1.53	0.05	0.002	0.023	PVC
1103	P-573	J-424	J-425	398.00	300	120.00	11.37	0.16	0.034	0.133	PVC
1107	P-577	J-206	J-224	304.00	322	120.00	12.03	0.15	0.033	0.104	HDPE
1118	P-590	J-340	J-437	148.00	200	120.00	1.25	0.04	0.002	0.016	PVC
1119	P-591	J-437	J-339	102.00	200	120.00	1.01	0.03	0.001	0.011	PVC
1143	P-678	J-511	J-510	93.00	250	120.00	6.52	0.13	0.04	0.115	PVC
1158	P-693	J-169	J-388	745.00	300	120.00	-4.14	0.06	0.01	0.02	PVC
1162	P-697	J-446	PMP-2	2.00	350	120.00	0.00	0	0	0	PVC
1163	P-698	PMP-2	J-447	2.00	350	120.00	0.00	0	0	0	PVC
1169	P-705	J-449	J-208	166.00	300	120.00	-6.62	0.09	0.007	0.049	PVC
1171	P-707	Supreme Steel	J-450	178.00	410	120.00	-0.03	0	0	0	HDPE
1172	P-708	J-450	J-1	334.00	400	120.00	-0.03	0	0	0	PVC
1174	P-710	J-343	J-452	68.00	200	120.00	0.26	0.01	0	0.001	PVC
1175	P-711	J-437	J-453	67.00	200	120.00	0.24	0.01	0	0.001	PVC
1186	P-723	J-418	J-495	222.00	600	120.00	21.84	0.08	0.005	0.015	PVC
1190	P-727	J-514	J-417	673.00	300	120.00	-7.73	0.11	0.025	0.065	PVC
1203	P-735	J-449	J-515	810.00	250	120.00	2.18	0.04	0.005	0.015	PVC
1206	P-737	J-425	J-516	666.00	300	120.00	11.37	0.16	0.023	0.133	PVC
1211	P-740	J-424	J-518	0.00	300	120.00	0.00	0	0	0	PVC
1213	P-741	J-390	J-519	897.00	400	120.00	0.00	0	0	0	PVC
1216	P-743	J-373	J-520	0.00	200	120.00	0.00	0	0	0	PVC
1218	P-744	J-348	J-521	448.00	200	120.00	-0.05	0	0	0	PVC
1219	P-745	J-521	J-349	448.00	200	120.00	-0.05	0	0	0	PVC
1222	P-746	J-521	J-523	0.00	200	120.00	0.00	0	0	0	PVC
1224	P-747	J-349	J-524	0.00	250	120.00	0.00	0	0	0	PVC
1226	P-748	J-351	J-525	0.00	200	120.00	0.00	0	0	0	PVC
1248	P-754	J-495	J-529	560.00	250	120.00	1.98	0.04	0.001	0.013	PVC
1251	P-756	J-529	J-530	0.00	250	120.00	1.98	0.04	0.001	0.013	PVC
1253	P-757	J-530	J-531	0.00	250	120.00	1.98	0.04	0.002	0.013	PVC
1255	P-758	J-531	J-532	0.00	250	120.00	1.98	0.04	0.001	0.013	PVC
1256	P-759	J-532	J-390	0.00	250	120.00	1.98	0.04	0.002	0.013	PVC
1257	P-760	J-390	J-495	0.00	600	120.00	-19.86	0.07	0.008	0.013	PVC
1262	P-762	PRV-A	J-535	185.00	300	120.00	0.00	0	0	0	PVC
1263	P-763	J-535	Panattoni	185.00	300	120.00	0.00	0	0	0	PVC
1280	P-773	J-542	PRV-A	0.00	300	120.00	0.00	0	0	0	PVC
1304	P-789	J-1	J-550	0.00	350	120.00	0.32	0	0	0	PVC
1309	P-792	J-82	J-552	0.00	200	120.00	0.02	0	0	0	PVC
1311	P-793	J-345	J-553	288.00	200	120.00	0.00	0	0	0	PVC
1314	P-795	J-197	J-554	247.00	300	120.00	0.32	0	0	0	PVC
1315	P-796	J-554	J-200	247.00	300	120.00	0.80	0.01	0	0.001	PVC
1316	P-797	J-261	J-554	0.00	200	120.00	0.48	0.02	0.001	0.002	PVC
1318	P-798	J-261	J-555	401.00	300	120.00	1.75	0.02	0	0.004	PVC
1319	P-799	J-555	J-196	401.00	300	120.00	1.35	0.02	0.001	0.003	PVC
1324	P-801	J-555	J-558	0.00	200	120.00	0.00	0	0	0	PVC
1325	P-802	J-558	J-556	0.00	200	120.00	0.00	0	0	0	PVC
1326	P-803	J-557	J-558	0.00	200	120.00	0.00	0	0	0	PVC
1331	P-806	J-168	J-560	1,219.00	350	120.00	0.44	0	0	0	PVC
1334	P-808	J-246	J-561	359.00	322	120.00	3.32	0.04	0.002	0.01	HDPE
1335	P-809	J-561	J-278	359.00	300	120.00	3.32	0.05	0.002	0.013	PVC
1337	P-810	J-277	J-562	362.00	300	120.00	5.78	0.08	0.009	0.038	PVC
1338	P-811	J-562	J-451	362.00	300	120.00	5.73	0.08	0.006	0.037	PVC
1340	P-812	J-451	J-563	0.00	300	120.00	5.44	0.08	0.01	0.034	PVC
1343	P-814	J-563	J-564	0.00	300	120.00	4.45	0.06	0.008	0.023	PVC
1344	P-815	J-564	J-167	0	300	120	4.45	0.06	0.004	0.023	PVC
1346	P-816	J-275	J-565	618	300	120	3.76	0.05	0.004	0.017	PVC
1347	P-817	J-565	J-180 (Dummy)	618	300	120	2.5	0.04	0.003	0.008	PVC
1349	P-818	J-275	J-566	785	300	120	2.94	0.04	0.002	0.011	PVC
1350	P-819	J-614	J-388	785	300	120	4.14	0.06	0.013	0.02	PVC
1352	P-820	J-566	J-567	0	300	120	0.05	0	0	0	PVC
1354	P-821	J-262	J-568	797	300	120	-3.65	0.05	0.008	0.016	PVC
1355	P-822	J-568	J-449	797	300	120	-3.65	0.05	0.006	0.016	PVC
1357	P-823	Panattoni	J-569	726	300	120	-0.52	0.01	0	0.001	PVC
1361	P-826	J-570	J-464	726	300	120	-0.52	0.01	0	0.001	PVC
1364	P-828	J-571	J-570	726	300	120	-0.52	0.01	0	0	PVC
1368	P-830	J-573	Supreme Steel	1,001	400	120	-0.03	0	0	0	PVC
1374	P-834	J-575	J-369	589	300	120	-3.66	0.05	0.002	0.016	PVC
1376	P-835	J-424	J-576	899	400	120	10.05	0.08	0.006	0.026	PVC
1388	P-838	J-569	J-578	726	300	120	-0.52	0.01	0	0	PVC
1389	P-839	J-578	J-571	726	300	120	-0.52	0.01	0	0.001	PVC
1391	P-840	J-497	J-579	41	300	120	0	0	0	0	PVC
1392	P-841	J-579	J-498	41	300	120	0	0	0	0	PVC
1406	P-848	J-576	J-586	899	400	120	8.38	0.07	0.005	0.019	PVC
1453	P-873	J-347	J-602	818	300	120	0.07	0	0	0	PVC
1454	P-874	J-602	J-252	818	300	120	0.07	0	0	0	PVC
1474	P-884	J-481	J-607	0	300	120	0	0	0	0	PVC
1476	P-885	J-508	J-608	503	300	120	0.59	0.01	0	0.001	PVC
1479	P-887	J-608	J-609	0	300	120	0	0	0	0	PVC
1481	P-888	J-391 (Dummy)	J-610	624	400	120	5.75	0.05	0.004	0.009	PVC
1482	P-889	J-610	J-508	624	300	120	5.04	0.07	0.006	0.029	PVC
1484	P-890	J-415	J-611	176	300	120	-3.77	0.05	0.002	0.017	PVC
1485	P-891	J-611	J-9	176	300	120	-3.77	0.05	0	0.018	PVC
1491	P-895	J-432	J-447	0	350	120	0	0	0	0	PVC
1493	P-896	J-446	CV-2	1	350	120	0	0	0	0	PVC
1494	P-897	CV-2	J-281	1	350	120	0	0	0	0	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1505	P-904	J-565	J-614	0	300	120	1.26	0.02	0	0.002	PVC
1506	P-905	J-614	J-566	0	300	120	-2.87	0.04	0.003	0.01	PVC
1560	P-933	J-508	J-629	1,206	400	120	8.11	0.06	0.008	0.018	PVC
1561	P-934	J-629	J-628	1,206	400	120	8.11	0.06	0.006	0.017	PVC
1620	P-954	J-628	J-634	906	400	120	8.11	0.06	0.003	0.018	PVC
1682	P-967	J-516	J-642	666	400	120	11.37	0.09	0.003	0.033	PVC
1683	P-968	J-642	J-393	666	400	120	11.37	0.09	0.002	0.033	PVC
1743	P-540(2)	J-647	J-393	848	400	120	5.52	0.04	0.003	0.009	PVC
1745	P-974	J-647	J-648 (Dummy)	0	300	120	0.77	0.01	0	0.001	PVC
1747	P-975	J-648 (Dummy)	J-649	0	300	120	-1.77	0.03	0.001	0.004	PVC
1749	P-540(1)(1)	J-392	J-650	848	400	120	8.06	0.06	0.005	0.017	PVC
1750	P-540(1)(2)	J-650	J-647	848	400	120	6.29	0.05	0.002	0.011	PVC
1751	P-976	J-649	J-650	0	300	120	-1.77	0.03	0.001	0.004	PVC
1794	P-691(1)	J-166	J-651	105	350	120	-15.25	0.16	0.011	0.108	PVC
1795	P-691(2)	J-651	PRV-2i	1	76	120	-15.25	3.36	0.184	183.877	PVC
1797	P-438(1)	PRV-2i	J-652	1	76	120	-15.25	3.36	0.184	183.877	PVC
1798	P-438(2)	J-652	J-513	118	350	120	-15.25	0.16	0.013	0.108	PVC
1807	P-531(1)	J-207	J-653	39	300	120	-30.56	0.43	0.032	0.83	PVC
1808	P-531(2)	J-653	PRV-Bi	1	100	120	-30.56	3.89	0.175	174.947	PVC
1810	P-532(1)	PRV-Bi	J-654	1	100	120	-30.56	3.89	0.175	174.947	PVC
1811	P-532(2)	J-654	J-210	144	300	120	-30.56	0.43	0.119	0.829	PVC
1816	P-246(1)	J-190	J-655	43	300	120	0	0	0	0	PVC
1817	P-246(2)	J-655	PRV-1i	1	76	120	0	0	0	0	PVC
1819	P-247(1)	PRV-1i	J-656	1	76	120	0	0	0	0	PVC
1820	P-247(2)	J-656	J-191	166	265	120	0	0	0	0	HDPE
1825	P-605(1)	J-456	J-657	123	200	120	-3.51	0.11	0.013	0.109	PVC
1826	P-605(2)	J-657	PRV-21i	1	76	120	-3.51	0.77	0.012	12.129	PVC
1828	P-606(1)	PRV-21i	J-658	1	76	120	-3.51	0.77	0.012	12.129	PVC
1829	P-606(2)	J-658	J-140	37	200	120	-3.51	0.11	0.004	0.108	PVC
1834	P-131(1)	J-124	J-659	15	200	120	0	0	0	0	PVC
1835	P-131(2)	J-659	PRV-3i	1	50	120	0	0	0	0	PVC
1837	P-132(1)	PRV-3i	J-660	1	50	120	0	0	0	0	PVC
1838	P-132(2)	J-660	J-126	64	200	120	0	0	0	0	PVC
1858	P-989	J-83	J-662	0	200	120	0	0	0	0	PVC
1860	P-990	J-85	J-663	0	200	120	0	0	0	0	PVC
1861	P-991	J-277	J-181	0	300	120	-0.66	0.01	0	0	PVC
1883	P-854(1)	J-589	J-666	120	250	120	-6.52	0.13	0.014	0.115	PVC
1884	P-854(2)	J-666	PRV-19i	1	76.2	120	-6.52	1.43	0.038	37.579	PVC
1886	P-680(1)	PRV-19i	J-667	1	76.2	120	-6.52	1.43	0.038	37.579	PVC
1887	P-680(2)	J-667	J-165	61	250	120	-6.52	0.13	0.007	0.116	PVC
1931	P-790(1)	J-550	J-668	0	350	120	0.32	0	0	0	PVC
1932	P-790(2)	J-668	J-454	0	350	120	0.32	0	0	0	PVC
1950	P-831(1)	J-481	J-675	1,001	400	120	0.16	0	0	0	PVC
1951	P-831(2)	J-675	J-574	1,001	400	120	0.16	0	0	0	PVC
1953	P-886(1)	J-608	J-676	503	400	120	0.59	0	0	0	PVC
1954	P-886(2)	J-676	J-481	503	400	120	0.59	0	0	0	PVC
1966	P-490(1)	J-253	J-682	280	200	120	0	0	0	0	PVC
1967	P-490(2)	J-682	J-371	280	200	120	0	0	0	0	PVC
1975	P-627(1)	J-492	J-685	233	300	120	0.65	0.01	0	0.001	PVC
1976	P-627(2)	J-685	J-493	233	300	120	0.65	0.01	0	0	PVC
1981	P-833(1)	J-508	J-687	589	300	120	-3.66	0.05	0.004	0.016	PVC
1982	P-833(2)	J-687	J-575	589	300	120	-3.66	0.05	0.003	0.016	PVC
1984	P-725(1)	J-9	J-688	642	300	120	-7.56	0.11	0.015	0.063	PVC
1985	P-725(2)	J-688	J-514	642	300	120	-7.56	0.11	0.029	0.062	PVC
1987	P-849(1)	J-586	J-689	899	400	120	8.29	0.07	0.002	0.019	PVC
1988	P-849(2)	J-689	J-391 (Dummy)	899	400	120	8.29	0.07	0.004	0.018	PVC
1990	P-428(1)	J-81	J-690	1,571	250	120	-6.52	0.13	0.03	0.115	PVC
1991	P-428(2)	J-690	J-510	1,571	250	120	-6.52	0.13	0.035	0.115	PVC
1993	P-853(1)	J-372	J-691	581	250	120	-6.52	0.13	0.027	0.115	PVC
1994	P-853(2)	J-691	J-589	581	250	120	-6.52	0.13	0.023	0.116	PVC
1996	P-286(1)	J-256	J-692	219	200	120	-0.22	0.01	0	0.001	HDPE
1997	P-286(2)	J-692	J-257	219	200	120	-0.22	0.01	0	0.001	HDPE
1999	P-76(1)	J-71	J-693	166	200	120	0.11	0	0	0	PVC
2000	P-76(2)	J-693	J-72	166	200	120	0.11	0	0	0	PVC
2003	P-988(2)	J-694	J-200	0	200	120	2.01	0.06	0.008	0.039	PVC
2005	P-988(1)(1)	J-515	J-695	0	200	120	2.01	0.06	0.006	0.039	PVC
2006	P-988(1)(2)	J-695	J-694	0	200	120	2.01	0.06	0.008	0.039	PVC
2010	P-956(1)	J-392	J-697	0	400	120	-8.11	0.06	0.004	0.018	PVC
2011	P-956(2)	J-697	J-634	0	400	120	-8.11	0.06	0.004	0.017	PVC
2013	P-832(1)	J-574	J-698	1,001	400	120	0.16	0	0	0	PVC
2014	P-832(2)	J-698	J-573	1,001	400	120	0.16	0	0	0	PVC
2016	P-571(1)	J-390	J-699	201	400	120	21.52	0.17	0.022	0.107	PVC
2017	P-571(2)	J-699	J-424	201	400	120	21.52	0.17	0.017	0.107	PVC
2026	P-948(2)	J-701	J-497	0	300	120	0.65	0.01	0	0.001	PVC
2049	P-900(1)	J-560	J-709	1,219	350	120	0	0	0	0	PVC
2050	P-900(2)	J-709	J-613	1,219	350	120	0	0	0	0	PVC
2146	P-687(1)(1)	J-393	J-720	807	400	120	0	0	0	0	PVC
2147	P-687(1)(2)	J-720	J-719	807	360	130	0	0	0	0	HDPE
2149	P-1029	J-111	J-721	0	200	120	0	0	0	0	PVC
2150	P-1030	J-168	J-167	0	350	120	6.42	0.07	0.009	0.022	PVC
2154	P-1032	J-555	J-723	0	300	120	0.4	0.01	0	0.001	PVC
2156	P-1033	J-723	J-724	0	300	120	0.4	0.01	0	0	PVC
2158	P-1034	J-724	J-725	0	300	120	0.4	0.01	0	0	PVC
2159	P-1035	J-725	J-192	0	300	120	0.4	0.01	0	0	PVC

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Appendix D

Existing System with Improvements Simulation Results

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
185	J-160	584,027.01	5,934,838.88	678.02	0	79.50	734.00
186	J-222	582,145.56	5,932,813.74	700.26	0	63.50	745.00
187	J-162	583,810.38	5,934,670.57	685.00	0	69.60	734.00
188	J-138	584,613.67	5,935,181.42	678.38	0	78.90	734.00
189	J-192	581,191.96	5,933,912.97	677.56	0	95.70	745.00
190	J-119	584,936.53	5,935,869.14	667.10	0	70.90	717.01
191	J-134	584,764.89	5,935,072.26	680.51	0.03	75.90	734.00
192	J-67	581,650.04	5,931,561.40	710.00	0	77.70	764.74
193	J-38	581,243.76	5,931,279.09	710.00	0.01	77.70	764.72
194	J-41	581,141.03	5,931,480.63	710.00	0.01	77.70	764.72
195	J-144	584,396.66	5,935,219.39	675.00	0	83.70	734.00
196	J-37	581,243.76	5,931,168.95	710.00	0	77.70	764.71
197	J-472	580,740.47	5,933,183.14	689.91	0	78.20	745.00
198	J-201	581,815.00	5,933,229.15	690.13	0	77.90	745.00
199	J-91	582,694.12	5,935,128.13	658.00	0	82.60	716.21
200	J-103	585,091.20	5,936,277.99	665.00	0.03	73.80	717.01
201	J-53	581,438.28	5,930,980.15	710.00	0.03	77.70	764.72
202	J-40	581,233.98	5,931,482.32	710.00	0	77.70	764.72
203	J-107	584,778.23	5,935,996.97	664.16	0	75.00	717.01
204	J-212	581,825.45	5,932,053.99	710.00	0	77.70	764.75
205	J-197	581,603.91	5,933,472.82	685.44	0	84.50	745.00
206	J-159	584,150.38	5,934,848.85	679.15	0	77.90	734.00
207	J-163	583,696.80	5,934,580.94	685.00	0	69.60	734.01
208	J-92	582,355.13	5,935,027.71	660.00	0.02	79.80	716.21
209	J-90	582,616.55	5,935,084.61	660.00	0.05	79.80	716.21
210	J-111	585,098.38	5,935,794.30	672.05	0.05	63.80	717.01
211	J-177	583,865.02	5,934,178.46	693.29	0	57.80	734.01
212	J-471	580,745.35	5,933,130.74	690.00	0	78.10	745.00
213	J-233	584,681.75	5,934,979.21	681.75	0.04	74.20	734.00
214	68 (Dum	580,952.95	5,932,747.92	698.59	0.68	65.90	745.00
215	J-1	579,511.27	5,931,168.86	705.00	0.18	84.80	764.71
216	J-174	583,865.88	5,934,330.48	690.60	0.04	61.60	734.01
218	J-131	584,433.28	5,934,995.60	679.54	0.04	77.30	734.00
219	J-100	584,835.40	5,936,162.83	665.00	0.05	73.80	717.01
220	J-75	581,067.83	5,934,963.64	655.66	0	86.00	716.21
221	J-60	581,268.02	5,931,483.28	710.00	0	77.70	764.72
222	J-217	581,836.74	5,931,627.98	710.00	0	77.70	764.76
223	J-146	584,443.42	5,934,865.47	686.39	0	67.60	734.00
224	J-6	579,945.01	5,931,013.88	708.42	0.01	79.90	764.71
225	J-169	583,532.49	5,933,358.14	700.00	0	63.90	745.00
226	J-4	579,847.42	5,931,278.15	705.69	0	83.80	764.71
227	J-27	580,669.54	5,930,951.45	710.00	0.03	77.70	764.71
228	J-158	584,415.79	5,934,856.33	685.70	0	68.60	734.00
229	J-14	580,335.90	5,931,383.96	710.00	0	77.70	764.71
230	J-105	584,480.67	5,935,747.97	663.83	0.05	75.50	717.01
231	J-261	581,205.35	5,933,531.77	685.10	0	85.00	745.00
232	J-51	581,311.65	5,930,974.43	710.00	0.06	77.70	764.71

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
233	J-183	582,114.01	5,933,238.15	690.57	0	77.30	745.00
234	J-106	584,742.82	5,936,007.34	663.04	0.03	76.60	717.01
235	J-244	581,247.28	5,930,944.87	712.82	0	73.70	764.71
236	J-185	582,109.89	5,933,372.58	689.49	0.12	78.80	745.00
237	J-205	581,855.89	5,932,883.46	697.62	0	67.30	745.00
238	J-88	582,477.45	5,934,962.82	661.52	0.05	77.60	716.21
239	J-87	582,416.94	5,934,900.96	661.92	0	77.10	716.21
240	J-104	584,294.78	5,935,708.60	663.84	0.05	75.50	717.01
241	J-246	581,897.49	5,931,628.85	710.00	0	77.70	764.77
242	J-232	584,892.94	5,934,920.80	684.28	0	70.60	734.00
243	J-30	580,902.68	5,930,954.31	710.00	0.02	77.70	764.71
244	J-9	580,323.88	5,930,706.90	710.00	0.01	77.70	764.71
245	J-182	582,375.00	5,933,263.31	692.23	0.04	74.90	745.00
246	J-203	581,820.84	5,933,082.06	694.39	0.07	71.80	745.00
247	J-65	581,778.70	5,931,509.37	710.00	0	77.70	764.74
248	J-113	584,707.09	5,935,813.70	666.13	0	72.20	717.01
249	J-126	584,863.23	5,935,234.31	677.59	0.05	80.10	734.00
251	J-175	583,860.04	5,934,212.11	692.89	0.02	58.40	734.01
252	J-108	584,859.07	5,935,946.29	665.31	0.01	73.40	717.01
253	J-152	584,376.31	5,934,716.20	687.39	0.04	66.20	734.00
254	J-200	581,603.76	5,933,231.65	690.97	0	76.70	745.00
255	J-36	581,245.19	5,931,074.55	710.09	0	77.50	764.71
256	J-143	584,418.36	5,935,234.31	675.12	0	83.60	734.00
257	J-81	581,858.80	5,934,643.74	665.00	0	72.70	716.21
258	J-12	580,220.70	5,931,351.93	710.00	0	77.70	764.71
259	J-226	582,264.78	5,932,630.99	705.95	0.02	55.40	745.00
260	J-45	580,893.42	5,931,477.97	710.00	0.02	77.70	764.71
261	J-17	580,311.95	5,931,197.47	710.00	0	77.70	764.71
262	J-206	581,857.12	5,932,625.05	705.00	0	56.80	745.00
263	J-115	584,825.79	5,935,796.19	666.72	0.02	71.40	717.01
264	J-150	584,403.44	5,934,788.09	687.49	0	66.00	734.00
265	J-77	581,167.95	5,934,784.85	659.73	0	80.20	716.21
266	J-18	580,314.80	5,931,075.86	708.85	0	79.30	764.71
267	J-141	584,418.36	5,935,257.37	675.00	0	83.70	734.00
268	J-8	580,315.10	5,931,044.42	708.00	0.03	80.50	764.71
270	J-118	585,014.92	5,935,991.35	667.08	0.05	70.90	717.01
271	J-34	581,184.46	5,930,958.60	713.60	0	72.50	764.71
272	J-263	580,990.65	5,933,540.47	686.38	0	83.20	745.00
273	J-135	584,890.35	5,935,064.77	680.00	0.06	76.60	734.00
274	J-121	584,820.49	5,935,506.24	675.00	0.01	59.60	717.01
275	J-181	582,540.59	5,933,275.94	693.31	0.01	73.40	745.00
276	J-264	581,189.28	5,933,693.30	681.63	0.61	90.00	745.00
277	J-220	582,117.40	5,932,983.49	695.93	0.08	69.60	745.00
278	J-252	578,937.82	5,934,828.30	660.00	0.01	79.80	716.21
279	J-142	584,423.78	5,935,296.70	675.00	0	83.70	734.00
280	J-109	584,921.74	5,935,884.21	666.76	0.03	71.30	717.01
281	J-129	584,501.09	5,935,261.44	676.15	0.05	82.10	734.00

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
282	J-39	581,239.51	5,931,322.53	710.00	0	77.70	764.72
283	J-164	583,606.03	5,934,540.88	685.74	0	68.50	734.01
285	J-219	582,113.42	5,933,083.07	693.64	0.03	72.90	745.00
286	J-469	580,912.58	5,932,829.94	695.69	0	70.00	745.00
287	J-256	580,441.19	5,935,464.19	655.00	0.03	86.90	716.21
288	J-120	584,734.38	5,935,692.75	670.15	0	66.50	717.01
289	J-230	581,106.83	5,932,460.94	706.93	0	54.00	745.01
290	J-130	584,431.22	5,935,093.29	677.58	0.03	80.10	734.00
291	J-117	585,014.92	5,936,121.64	665.00	0.03	73.80	717.01
292	J-223	582,152.61	5,932,731.90	702.98	0	59.60	745.00
293	J-218	581,867.74	5,931,628.35	710.00	0	77.70	764.76
294	J-46	580,798.60	5,931,476.05	710.00	0	77.70	764.71
295	J-2	579,680.28	5,931,170.16	705.50	0.11	84.00	764.71
296	J-26	580,564.63	5,931,456.51	710.00	0.01	77.70	764.71
297	J-189	581,084.12	5,934,453.39	665.00	0.04	72.70	716.21
298	J-211	581,876.01	5,932,068.33	710.09	0	77.60	764.75
299	J-23	580,668.11	5,931,070.17	710.00	0.01	77.70	764.71
301	J-59	581,386.82	5,931,485.18	710.00	0.61	77.70	764.72
302	J-156	584,404.53	5,934,722.07	688.13	0	65.10	734.00
303	J-199	581,769.17	5,933,510.82	685.00	0.01	85.20	745.00
305	J-148	584,454.98	5,934,760.96	689.42	0.01	63.30	734.00
306	J-132	584,558.06	5,935,001.03	680.87	0.02	75.40	734.00
307	J-19	580,403.49	5,931,080.18	707.98	0	80.50	764.71
308	J-83	581,967.59	5,934,879.14	661.00	0	78.40	716.21
309	J-139	584,644.86	5,935,312.98	676.87	0.03	81.10	734.00
310	J-133	584,653.03	5,935,049.18	680.00	0.02	76.60	734.00
311	J-96	584,368.02	5,935,856.50	660.02	0.03	80.90	717.01
312	J-204	581,850.05	5,933,080.11	694.67	0	71.40	745.00
313	J-52	581,362.87	5,930,976.72	710.00	0	77.70	764.72
314	J-55	581,524.10	5,931,157.51	710.00	0.03	77.70	764.73
315	J-74	580,931.94	5,934,929.32	656.10	0	85.30	716.21
316	J-253	578,957.63	5,934,474.88	660.00	0.01	79.80	716.21
317	J-225	582,168.53	5,932,538.56	707.11	0	53.80	745.00
318	J-186	582,113.31	5,933,524.29	685.00	0	85.20	745.00
319	J-66	581,776.04	5,931,621.09	710.00	0	77.70	764.75
320	J-227	582,440.48	5,932,638.63	706.71	0	54.40	745.00
321	J-54	581,528.40	5,930,990.16	710.00	0	77.70	764.72
322	J-470	580,815.61	5,933,005.16	692.36	0	74.70	745.00
323	J-165	583,521.11	5,934,524.87	687.40	0	66.20	734.01
324	J-32	581,064.31	5,930,954.31	710.00	0.03	77.70	764.71
325	J-42	581,092.22	5,931,480.07	710.00	0.02	77.70	764.71
326	J-178	583,196.31	5,933,356.52	696.11	0.06	69.40	745.00
327	J-93	584,191.17	5,935,768.07	660.00	0.05	80.90	717.01
328	J-97	584,487.83	5,935,930.76	660.00	0.03	80.90	717.01
329	J-122	584,821.83	5,935,460.16	675.00	0.02	59.60	717.01
330	J-84	582,052.57	5,934,877.70	660.32	0.01	79.30	716.21
331	J-62	581,787.29	5,931,163.23	710.00	0	77.70	764.73

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
332	J-29	580,819.72	5,930,954.31	710.00	0.01	77.70	764.71
333	J-94	584,255.00	5,935,803.19	660.00	0	80.90	717.01
334	J-72	580,939.25	5,935,281.52	655.00	0.03	86.90	716.21
335	J-188	582,266.79	5,933,527.86	686.55	0	83.00	745.00
336	J-231	580,791.64	5,934,829.71	658.98	0	81.20	716.21
337	J-229	581,106.36	5,932,407.45	708.32	0.01	52.10	745.01
338	J-466	580,911.13	5,932,595.87	700.92	0	62.60	745.00
339	J-10	579,940.63	5,931,347.65	705.00	0.06	84.70	764.71
340	J-95	584,308.01	5,935,828.08	660.00	0.01	80.90	717.01
341	5 (Dumr	580,618.70	5,931,343.45	710.00	0.68	77.70	764.71
342	J-78	581,169.38	5,934,827.76	658.78	0	81.50	716.21
343	J-99	584,705.73	5,936,073.73	662.40	0.07	77.50	717.01
345	J-7	579,949.27	5,931,039.18	708.18	0	80.20	764.71
346	J-196	581,597.38	5,933,587.35	683.44	0.05	87.40	745.00
347	J-208	581,439.10	5,932,459.61	706.90	0.01	54.10	745.00
348	J-68	580,592.95	5,934,845.60	659.96	0.04	79.80	716.21
349	J-73	580,877.59	5,934,935.04	656.37	0.06	84.90	716.21
350	J-79	581,379.39	5,934,807.01	659.35	0	80.70	716.21
351	J-464	580,909.59	5,932,458.81	705.00	0	56.80	745.01
352	J-221	582,125.37	5,932,889.89	698.69	0	65.70	745.00
353	J-63	581,781.57	5,931,261.93	710.00	0.04	77.70	764.74
354	J-48	580,984.87	5,931,374.92	710.00	0	77.70	764.71
355	J-173	583,884.96	5,934,430.17	688.11	0.06	65.10	734.01
356	J-136	584,891.71	5,935,152.93	679.69	0	77.10	734.00
357	J-255	580,263.72	5,934,844.03	655.00	0.02	86.90	716.21
358	J-137	584,631.30	5,935,458.11	675.00	0.04	59.60	717.01
359	J-44	580,980.30	5,931,477.21	710.00	0	77.70	764.71
363	J-69	580,683.06	5,934,980.81	657.45	0.04	83.40	716.21
364	J-461	580,324.91	5,931,786.10	709.66	0.03	78.10	764.70
365	J-50	580,982.78	5,931,104.50	710.00	0	77.70	764.71
366	J-58	581,515.23	5,931,487.78	710.00	0.01	77.70	764.73
367	J-61	581,675.72	5,931,158.94	710.00	0.01	77.70	764.73
368	6 (Dumr	581,521.24	5,931,231.89	710.00	0.68	77.70	764.73
369	J-47	580,657.25	5,931,474.23	710.00	0.01	77.70	764.71
370	J-176	583,816.43	5,934,177.51	694.01	0.13	56.80	734.01
371	J-128	584,625.87	5,935,253.30	677.60	0.04	80.10	734.00
372	J-151	584,368.17	5,934,786.73	686.46	0.02	67.50	734.00
373	J-13	580,314.34	5,931,355.17	710.00	0.01	77.70	764.71
374	J-33	581,129.33	5,930,960.12	711.70	0	75.20	764.71
376	J-123	584,823.26	5,935,405.93	675.00	0	59.60	717.01
378	J-21	580,469.94	5,931,023.06	709.21	0.04	78.80	764.71
379	30 (Dum	582,732.45	5,933,277.32	694.69	0.68	71.40	745.00
380	J-202	581,938.04	5,933,230.80	691.08	0	76.50	745.00
381	J-168	583,530.88	5,933,486.18	696.64	0	68.60	745.00
382	J-49	580,979.92	5,931,250.39	710.00	0.04	77.70	764.71
383	J-110	584,991.94	5,935,799.82	669.94	0.04	66.80	717.01
384	J-102	585,009.28	5,936,277.18	663.86	0.03	75.50	717.01

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385	J-31	580,988.50	5,930,955.74	710.00	0	77.70	764.71
386	J-147	584,453.45	5,934,840.49	687.96	0	65.40	734.00
387	J-28	580,746.77	5,930,951.45	710.00	0	77.70	764.71
388	J-24	580,662.38	5,931,227.51	710.00	0	77.70	764.71
389	J-465	580,908.44	5,932,502.26	705.00	0	56.80	745.01
390	J-154	584,411.58	5,934,645.67	688.86	0.03	64.10	734.00
391	J-89	582,495.94	5,935,018.15	660.81	0.02	78.60	716.21
392	J-153	584,372.24	5,934,648.39	687.96	0.03	65.40	734.00
394	J-98	584,633.48	5,936,025.02	660.29	0.03	80.50	717.01
395	J-259	580,335.37	5,931,450.69	710.00	0.12	77.70	764.71
396	J-3	579,802.82	5,931,225.65	706.10	0.09	83.20	764.71
397	J-85	582,115.29	5,934,881.39	660.25	0	79.40	716.21
398	J-71	580,907.63	5,935,126.70	655.00	0.03	86.90	716.21
399	J-116	585,011.03	5,936,214.00	665.00	0.03	73.80	717.01
400	J-167	583,523.26	5,933,883.17	694.49	0	71.70	745.00
401	J-70	580,800.35	5,935,056.62	655.00	0.03	86.90	716.21
402	J-43	581,021.33	5,931,478.00	710.00	0	77.70	764.71
403	J-179	582,955.94	5,933,296.73	695.00	0	71.00	745.00
406	J-224	582,174.13	5,932,629.80	705.00	0.08	56.80	745.00
407	J-35	581,249.48	5,930,968.71	712.31	0	74.40	764.71
408	J-145	584,444.72	5,934,995.00	679.73	0	77.00	734.00
409	J-170	583,875.75	5,934,103.79	694.22	0	56.50	734.01
410	J-228	582,556.63	5,932,642.20	708.46	0.05	51.90	745.00
411	J-15	580,429.24	5,931,386.27	710.00	0.06	77.70	764.71
412	eson Zo	581,783.00	5,931,386.36	710.00	0.08	77.70	764.74
413	J-262	580,997.23	5,933,183.46	691.01	0	76.60	745.00
414	J-76	581,080.70	5,934,784.85	659.39	0	80.70	716.21
415	J-82	581,851.29	5,934,868.21	661.29	0	78.00	716.21
416	J-187	582,195.09	5,933,525.99	685.61	0.02	84.30	745.00
417	J-124	584,883.57	5,935,380.79	675.00	0	59.60	717.01
418	J-86	582,250.40	5,934,884.38	660.62	0.02	78.90	716.21
419	J-101	584,926.98	5,936,225.99	665.00	0.04	73.80	717.01
420	J-140	584,498.38	5,935,323.83	675.17	0.02	83.50	733.99
422	J-198	581,719.60	5,933,471.45	685.00	0.22	85.20	745.00
423	J-248	581,903.32	5,932,070.50	710.80	0	76.60	764.75
424	J-247	581,891.92	5,931,996.23	710.54	0	77.00	764.75
426	J-5	579,945.61	5,931,212.07	706.57	0	82.50	764.71
427	J-171	583,770.32	5,934,494.96	687.57	0.03	65.90	734.01
428	J-22	580,670.19	5,931,024.49	710.00	0.01	77.70	764.71
429	J-16	580,476.44	5,931,406.30	710.00	0	77.70	764.71
430	J-184	582,112.89	5,933,307.91	690.00	0.03	78.10	745.00
431	J-57	581,518.38	5,931,364.91	710.00	0	77.70	764.73
432	J-11	580,115.27	5,931,356.66	710.00	0.07	77.70	764.71
433	J-467	580,945.04	5,932,670.20	698.68	0.12	65.70	745.00
434	J-127	584,738.45	5,935,230.24	678.28	0.03	79.10	734.00
435	J-20	580,457.07	5,931,080.27	710.00	0.01	77.70	764.71
436	J-172	583,827.64	5,934,460.07	688.49	0.03	64.60	734.01

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437	J-157	584,429.91	5,934,843.88	686.75	0.01	67.10	734.00
438	J-161	583,932.31	5,934,795.27	682.13	0	73.60	734.00
439	J-114	584,722.31	5,935,766.42	668.89	0	68.30	717.01
440	J-149	584,407.51	5,934,758.25	688.05	0.02	65.20	734.00
441	akeshor	584,613.31	5,935,863.83	662.35	0.05	77.60	717.01
442	J-257	580,273.72	5,935,345.33	655.00	0.01	86.90	716.21
443	J-155	584,414.29	5,934,584.64	689.82	0.02	62.70	734.00
444	0 (Dumr	581,734.36	5,934,653.26	664.25	0.68	73.80	716.21
445	J-125	580,796.41	5,934,677.05	660.00	0.04	79.80	716.21
446	J-193	580,848.07	5,934,368.52	665.00	0.03	72.70	716.21
447	J-194	580,976.24	5,934,190.14	670.34	0.03	65.10	716.21
448	J-209	580,970.10	5,934,678.48	660.00	0.03	79.80	716.21
449	J-214	580,690.97	5,934,694.14	660.00	0	79.80	716.21
450	J-215	580,690.08	5,934,275.57	666.57	0	70.50	716.21
451	J-216	580,551.33	5,931,612.96	710.00	0	77.70	764.71
452	J-274	580,878.67	5,934,350.62	665.00	0	72.70	716.21
453	J-275	582,747.60	5,932,645.50	707.89	0.01	52.70	745.00
454	J-276	582,369.34	5,933,528.13	687.83	0.01	81.20	745.00
455	J-277	582,535.87	5,933,574.49	689.17	0.01	79.30	745.00
456	J-278	582,252.25	5,931,642.45	710.00	0	77.90	764.87
457	79 (Dum	582,429.55	5,931,644.90	712.34	0.68	74.70	764.93
458	J-280	582,657.75	5,931,650.26	715.00	0.21	71.00	765.01
460	J-317	582,199.34	5,932,409.79	709.00	0	51.10	745.00
461	preme S	579,529.45	5,930,618.12	710.00	0	77.70	764.71
462	J-369	580,329.98	5,930,530.83	711.57	0.02	75.40	764.71
463	J-413	584,962.80	5,935,893.67	667.76	0	69.90	717.01
464	J-414	580,992.55	5,933,333.24	690.00	0.01	78.10	745.00
465	J-415	580,322.26	5,930,836.93	709.65	0	78.20	764.71
466	J-416	580,996.56	5,933,257.52	690.00	0	78.10	745.00
467	J-417	581,409.37	5,930,749.49	710.00	0	77.70	764.71
468	J-418	581,473.62	5,930,748.31	710.00	0	77.70	764.71
469	J-426	581,027.60	5,931,617.03	710.00	0	77.70	764.72
470	J-427	581,474.51	5,931,632.42	711.07	0.1	76.20	764.73
472	J-433	581,230.40	5,931,623.34	710.40	0.01	77.10	764.72
473	J-455	585,032.66	5,934,913.17	682.73	0.01	72.80	734.00
474	J-456	584,578.32	5,935,458.14	674.14	0	60.90	717.01
475	J-457	584,473.57	5,935,561.72	668.91	0.02	68.30	717.01
476	J-458	584,552.88	5,935,630.17	668.40	0.01	69.00	717.01
477	J-459	584,630.33	5,935,622.09	670.00	0	66.70	717.01
478	J-460	584,399.04	5,935,479.51	669.91	0.01	66.90	717.01
479	J-462	584,407.26	5,935,625.71	666.69	0.01	71.40	717.01
480	J-473	584,318.20	5,935,632.34	665.00	0	73.80	717.01
481	J-474	580,907.43	5,933,564.98	687.95	0	81.00	745.00
482	J-475	584,394.68	5,934,582.93	689.24	0	63.50	734.00
483	J-476	584,378.97	5,934,558.28	688.81	0	64.10	734.00
484	J-477	584,385.26	5,934,422.76	691.17	0.04	60.80	734.00
485	J-478	584,452.79	5,934,337.14	695.00	0	55.40	734.00

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
486	J-479	584,456.37	5,934,203.11	695.00	0	55.40	734.00
487	J-480	584,346.35	5,934,199.50	695.00	0.02	55.40	734.00
488	untry Sq	584,451.06	5,934,432.27	692.57	0	58.80	734.00
489	J-482	584,501.53	5,934,435.28	693.17	0	58.00	734.00
490	J-483	582,554.17	5,934,938.61	661.50	0	77.70	716.21
491	J-484	580,257.71	5,934,709.77	655.00	0	86.90	716.21
492	J-485	580,164.03	5,934,700.83	655.00	0.01	86.90	716.21
493	Greenbria	580,160.09	5,934,602.78	655.28	0.04	86.50	716.21
494	J-487	580,157.19	5,934,461.58	658.62	0.01	81.70	716.21
495	J-488	580,264.39	5,934,426.70	660.00	0	79.80	716.21
496	J-489	580,262.15	5,934,273.16	662.79	0.01	75.80	716.21
497	J-490	580,263.09	5,934,169.52	664.93	0	72.80	716.21
498	J-491	580,263.09	5,934,052.82	668.12	0	68.30	716.21
499	J-492	580,603.96	5,933,233.91	687.77	0.02	81.20	745.00
500	J-493	580,285.22	5,933,229.98	685.12	0	85.00	745.00
501	J-494	580,019.98	5,933,222.44	681.92	0	89.60	745.00
502	J-496	579,846.07	5,933,216.09	683.33	0	87.50	745.00
503	J-497	579,558.48	5,933,207.86	680.78	0.18	91.20	745.00
504	J-498	579,384.04	5,933,248.61	680.76	0	91.20	745.00
505	J-499	580,585.32	5,935,532.59	655.00	0.03	86.90	716.21
506	J-500	580,800.29	5,934,469.04	664.91	0.03	72.80	716.21
507	Panatton	580,493.51	5,932,097.85	705.00	0.14	56.80	745.01
508	J-502	581,171.70	5,934,953.60	655.96	0.02	85.50	716.21
509	J-503	581,266.41	5,934,961.33	656.39	0.03	84.90	716.21
510	J-504	581,381.72	5,934,985.17	655.83	0.03	85.70	716.21
511	J-505	581,484.80	5,934,976.15	656.63	0.04	84.60	716.21
512	J-506	581,091.17	5,935,043.79	655.00	0.03	86.90	716.21
513	J-507	581,089.89	5,935,190.68	655.00	0.03	86.90	716.21
514	J-508	580,357.88	5,929,962.29	715.00	0	70.60	764.71
515	J-510	582,422.00	5,934,645.84	668.00	0	68.40	716.21
516	J-511	582,750.31	5,934,542.81	675.00	0	58.50	716.21
518	J-338	584,547.50	5,934,594.73	690.00	0	62.50	734.00
519	J-339	584,844.68	5,934,804.41	685.00	0.04	69.50	734.00
520	J-340	584,755.52	5,934,642.61	690.00	0.1	62.50	734.00
521	J-341	584,801.75	5,934,584.83	690.00	0	62.50	734.00
522	J-342	584,626.74	5,934,593.08	689.17	0	63.60	734.00
523	J-343	584,630.05	5,934,465.96	690.99	0.06	61.00	734.00
524	J-344	584,677.93	5,934,368.55	692.43	0	59.00	734.00
525	J-345	584,719.20	5,934,290.95	693.49	0.05	57.50	734.00
526	J-346	584,743.41	5,934,208.42	694.61	0	55.90	734.00
527	J-347	579,821.81	5,934,839.28	655.41	0	86.30	716.21
528	J-348	579,906.54	5,934,628.04	660.00	0.09	79.80	716.21
529	J-349	579,552.52	5,934,390.76	660.66	0.03	78.90	716.21
530	J-350	579,560.18	5,934,186.05	665.00	0	72.70	716.21
531	J-351	579,798.46	5,934,185.19	665.00	0	72.70	716.21
532	J-352	580,053.20	5,934,194.89	663.47	0	74.90	716.21
533	J-353	580,058.17	5,934,050.10	666.33	0	70.80	716.21

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
549	J-371	579,058.45	5,934,237.94	663.97	0	74.10	716.21
550	J-372	582,913.82	5,934,492.65	679.00	0	52.80	716.21
551	J-373	583,715.84	5,934,179.49	692.83	0	58.50	734.01
552	J-374	583,711.11	5,934,323.53	691.08	0	60.90	734.01
553	J-375	583,617.79	5,934,384.39	690.00	0	62.50	734.01
565	J-388	583,543.54	5,932,874.51	705.00	0	56.80	745.00
567	J-390	581,655.30	5,929,996.66	715.00	0.09	70.60	764.71
568	91 (Dum	580,970.38	5,929,997.16	715.00	0.68	70.60	764.71
569	J-392	580,813.36	5,929,007.00	720.00	0.01	63.50	764.70
570	J-393	581,663.98	5,929,028.48	715.00	4.54	70.60	764.70
593	J-424	581,660.97	5,929,623.62	713.50	0.03	72.70	764.71
594	J-425	581,665.24	5,929,366.79	715.00	0	70.60	764.70
602	J-437	584,749.37	5,934,767.29	686.86	0	66.90	734.00
614	J-449	581,421.38	5,932,595.83	704.53	0.21	57.40	745.00
615	J-450	579,529.68	5,930,833.39	710.00	0	77.70	764.71
616	J-451	582,718.01	5,933,794.15	686.82	0.08	82.60	745.00
617	J-452	584,568.62	5,934,437.45	692.38	0.07	59.10	734.00
618	J-453	584,709.29	5,934,821.05	685.00	0.06	69.50	734.00
619	J-454	578,967.63	5,931,180.10	705.00	0.09	84.80	764.71
621	J-481	579,912.34	5,929,983.06	710.05	0.12	77.60	764.71
623	J-495	581,742.29	5,930,634.26	710.00	0	77.70	764.71
624	J-514	581,024.45	5,930,758.71	710.00	0.04	77.70	764.71
1202	J-515	581,712.08	5,932,708.51	700.00	0.05	63.90	745.00
1205	J-516	581,669.94	5,929,192.84	715.00	0	70.60	764.70
1210	J-518	581,830.29	5,929,625.08	715.00	0	70.60	764.71
1212	J-519	581,835.07	5,929,999.06	715.66	0	69.60	764.71
1215	J-520	583,628.60	5,934,178.46	691.55	0	60.30	734.01
1217	J-521	579,709.90	5,934,475.78	661.19	0	78.10	716.21
1221	J-523	579,612.49	5,934,670.51	660.00	0	79.80	716.21
1223	J-524	579,458.36	5,934,392.85	660.00	0	79.80	716.21
1225	J-525	579,864.05	5,934,327.41	663.27	0	75.10	716.21
1247	J-529	581,722.82	5,930,546.21	711.81	0	75.10	764.71
1250	J-530	581,718.67	5,930,439.72	715.00	0	70.60	764.71
1252	J-531	581,695.54	5,930,265.84	715.00	0	70.60	764.71
1254	J-532	581,651.35	5,930,158.96	715.00	0	70.60	764.71
1261	J-535	580,317.76	5,932,082.48	705.00	0	56.80	745.01
1279	J-542	580,321.43	5,931,912.84	706.22	0	83.00	764.70
1303	J-550	579,304.34	5,931,106.29	705.49	0	84.10	764.71
1308	J-552	581,774.56	5,934,875.22	660.36	0.01	79.30	716.21
1310	J-553	584,830.76	5,934,337.70	691.53	0	60.30	734.00
1313	J-554	581,603.99	5,933,308.60	689.95	0	78.10	745.00
1317	J-555	581,321.58	5,933,537.76	685.33	0	84.70	745.00
1320	J-556	581,323.99	5,933,415.23	687.59	0	81.50	745.00
1322	J-557	581,250.04	5,933,467.96	686.55	0	83.00	745.00
1323	J-558	581,327.56	5,933,467.96	686.59	0	82.90	745.00
1330	J-560	584,062.95	5,933,663.17	698.76	0.12	65.60	745.00
1333	J-561	582,080.53	5,931,638.76	710.00	0	77.80	764.81

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1336	J-562	582,569.27	5,933,781.52	685.00	0.01	85.20	745.00
1339	J-563	583,023.88	5,933,806.52	689.56	0.27	78.70	745.00
1342	J-564	583,338.73	5,933,881.24	692.98	0	73.80	745.00
1345	J-565	582,744.06	5,932,889.49	701.99	0	61.10	745.00
1348	J-566	582,939.07	5,932,645.59	708.52	0.01	51.80	745.00
1351	J-567	583,002.33	5,932,556.57	709.00	0.01	51.10	745.00
1353	J-568	581,247.75	5,932,942.22	695.05	0	70.90	745.00
1356	J-569	580,577.37	5,932,096.86	705.31	0	56.40	745.01
1359	J-570	580,889.17	5,932,276.53	705.71	0	55.80	745.01
1362	J-571	580,880.65	5,932,177.12	706.82	0	54.20	745.01
1366	J-573	579,703.90	5,930,618.74	710.00	0.05	77.70	764.71
1369	J-574	579,904.79	5,930,431.14	710.00	0	77.70	764.71
1372	J-575	580,334.11	5,930,381.44	712.92	0	73.50	764.71
1375	J-576	581,433.82	5,929,694.07	715.00	0.45	70.60	764.71
1387	J-578	580,835.80	5,932,122.19	707.37	0	53.40	745.01
1390	J-579	579,380.19	5,933,203.20	681.18	0	90.60	745.00
1405	J-586	581,295.24	5,929,939.38	715.00	0.03	70.60	764.71
1452	J-602	579,239.65	5,934,831.22	656.38	0	84.90	716.21
1473	J-607	579,543.45	5,929,983.64	715.00	0	70.60	764.71
1475	J-608	580,203.48	5,929,958.96	713.28	0	73.00	764.71
1478	J-609	580,201.01	5,929,860.38	713.35	0	72.90	764.71
1480	J-610	580,552.48	5,929,989.36	715.00	0.19	70.60	764.71
1483	J-611	580,325.86	5,930,727.51	710.00	0	77.70	764.71
1499	J-613	584,353.40	5,933,669.57	695.76	0	69.90	745.00
1504	J-614	582,934.11	5,932,889.06	702.94	0	59.70	745.00
1556	J-628	580,375.92	5,929,164.92	717.44	0	67.10	764.70
1559	J-629	580,365.57	5,929,526.73	705.00	0	84.70	764.71
1619	J-634	580,375.70	5,929,000.34	718.77	0	65.20	764.70
1681	J-642	581,668.12	5,929,095.99	715.00	0	70.60	764.70
1741	J-647	581,271.30	5,929,015.97	720.00	0	63.50	764.70
1744	48 (Dum	581,275.92	5,928,657.02	720.00	0.68	63.50	764.70
1746	J-649	581,116.31	5,928,684.12	720.00	0	63.50	764.70
1748	J-650	581,110.60	5,929,012.69	721.17	0	61.80	764.70
1857	J-662	581,970.85	5,935,022.33	659.84	0	80.00	716.21
1859	J-663	582,116.21	5,935,056.50	657.14	0	83.90	716.21
1930	J-668	579,102.84	5,931,112.30	705.76	0	83.70	764.71
1949	J-675	579,907.29	5,930,219.27	710.00	0	77.70	764.71
1952	J-676	580,043.39	5,929,961.76	711.50	0	75.50	764.71
1965	J-682	578,966.18	5,934,323.21	662.52	0	76.20	716.21
1974	J-685	580,448.50	5,933,230.44	686.51	0	83.00	745.00
1980	J-687	580,334.63	5,930,185.02	714.34	0	71.50	764.71
1983	J-688	580,557.45	5,930,744.75	710.00	0	77.70	764.71
1986	J-689	581,209.13	5,929,990.60	715.00	0	70.60	764.71
1989	J-690	582,115.87	5,934,642.64	665.83	0	71.5	716.21
1995	J-692	580,367.90	5,935,411.75	655	0	86.9	716.21
1998	J-693	580,939.14	5,935,207.44	655	0	86.9	716.21
2001	J-694	581,593.23	5,933,015.33	699.23	0	65	745

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
2004	J-695	581,706.64	5,932,861.89	698.36	0	66.2	745
2009	J-697	580,594.61	5,929,003.29	722.94	0	59.3	764.7
2012	J-698	579,772.86	5,930,616.65	710	0	77.7	764.71
2015	J-699	581,656.96	5,929,786.31	715	0	70.6	764.71
2024	J-701	579,705.90	5,933,212.88	682	0	89.4	745
2048	J-709	584,218.05	5,933,682.14	696.07	0	69.5	745
2142	J-719	582,112.92	5,929,042.77	714.67	0	71	764.7
2145	J-720	581,900.54	5,929,036.19	714.83	0	70.8	764.7
2148	J-721	585,115.48	5,935,430.98	672.05	0	63.8	717.01
2153	J-723	581,364.59	5,933,637.12	683.4	0	87.4	745
2155	J-724	581,503.77	5,933,636.39	683.4	0	87.4	745
2157	J-725	581,505.07	5,933,898.96	680	0	92.3	745

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
654	P-120	J-102	J-116	63.00	200	120.00	0.00	0	0	0	PVC
655	P-156	J-147	J-148	80.00	200	120.00	0.84	0.03	0.001	0.007	PVC
656	P-78	J-73	J-74	58.00	200	120.00	-0.16	0.01	0	0	PVC
657	P-95	J-90	J-91	95.00	200	120.00	0.00	0	0	0	PVC
658	P-74	J-69	J-70	140.00	200	120.00	-0.38	0.01	0	0.002	PVC
659	P-201	J-191	J-192	96.00	300	120.00	-1.52	0.02	0	0.003	PVC
660	P-5	J-5	J-7	173.00	200	120.00	-0.60	0.02	0.001	0.004	PVC
661	P-119	J-115	J-109	130.00	200	120.00	0.28	0.01	0	0.001	PVC
662	P-307(2)	J-471	J-470	147.00	300	120.00	-1.10	0.02	0	0.002	PVC
663	P-216	J-205	J-206	353.00	300	120.00	-1.61	0.02	0.001	0.004	PVC
664	P-124	J-119	J-110	95.00	200	120.00	0.09	0	0	0	PVC
665	P-17	J-17	J-18	122.00	300	110.00	-1.06	0.01	0	0.002	Asbestos Cement
666	P-11	J-11	J-12	113.00	300	120.00	-0.52	0.01	0	0.001	PVC
667	P-73	J-68	J-69	169.00	200	120.00	-0.34	0.01	0	0.001	PVC
668	P-235	J-223	J-224	98.00	300	120.00	-1.05	0.01	0	0.001	PVC
669	P-46	J-44	J-45	77.00	300	110.00	2.25	0.03	0.001	0.008	Asbestos Cement
670	P-152	J-131	J-145	12.00	200	120.00	-0.84	0.03	0	0.006	PVC
671	P-141	J-134	J-135	126.00	150	120.00	0.22	0.01	0	0.003	PVC
672	P-30	J-28	J-29	73.00	300	110.00	-1.85	0.03	0	0.005	Asbestos Cement
673	P-195	J-185	J-186	131.00	300	120.00	0.79	0.01	0	0.001	PVC
674	P-306(2)	J-472	J-471	85.00	300	120.00	-1.10	0.02	0	0.001	PVC
675	P-215	J-204	J-205	197.00	300	120.00	-1.61	0.02	0.001	0.003	PVC
676	P-159	J-150	J-151	35.00	200	120.00	0.08	0	0	0	PVC
677	P-16	J-13	J-17	156.00	300	110.00	-1.06	0.01	0	0.002	Asbestos Cement
678	P-160	J-151	J-152	71.00	200	120.00	0.07	0	0	0	PVC
679	P-110	J-106	J-107	37.00	200	120.00	-0.03	0	0	0	PVC
680	P-10	J-10	J-11	167.00	300	120.00	-0.45	0.01	0	0	PVC
681	P-234	J-222	J-223	81.00	300	120.00	-1.05	0.01	0	0.002	PVC
682	P-72	J-67	J-58	158.00	300	110.00	6.68	0.09	0.01	0.058	Asbestos Cement
683	P-135	J-128	J-129	126.00	150	120.00	0.17	0.01	0	0.002	PVC
684	P-26	J-25 (Dummy)	J-26	119.00	300	110.00	-0.53	0.01	0	0.001	Asbestos Cement
685	P-172	J-162	J-163	145.00	300	120.00	-2.03	0.03	0.001	0.006	PVC
686	P-140	J-133	J-134	114.00	200	120.00	0.25	0.01	0	0.001	PVC
687	P-158	J-149	J-150	30.00	200	120.00	0.08	0	0	0	PVC
688	P-52	J-49	J-50	146.00	300	110.00	1.11	0.02	0	0.002	Asbestos Cement
689	P-148	J-129	J-141	83.00	150	120.00	0.00	0	0	0	PVC
690	P-182	J-173	J-174	102.00	200	120.00	-0.08	0	0	0	PVC
691	P-282	J-252	J-253	357.00	300	120.00	0.01	0	0	0	PVC
692	P-217	J-206	J-207	75.00	300	120.00	-4.16	0.06	0.003	0.02	PVC
693	P-15	J-15	J-16	51.00	300	110.00	-2.54	0.04	0	0.009	Asbestos Cement
694	P-109	J-99	J-106	76.00	200	120.00	0.00	0	0	0	PVC
695	P-142	J-135	J-136	88.00	200	120.00	0.39	0.01	0	0.002	PVC
696	P-181	J-172	J-173	65.00	200	120.00	-0.02	0	0	0	PVC
697	P-71	J-66	J-67	156.00	300	110.00	6.68	0.09	0.009	0.059	Asbestos Cement
698	P-193	J-183	J-184	75.00	300	120.00	0.94	0.01	0	0.001	PVC
699	P-238	J-226	J-227	86.00	300	120.00	1.40	0.02	0	0.003	PVC
700	P-157	J-148	J-149	48.00	200	120.00	0.22	0.01	0	0	PVC
701	P-75	J-70	J-71	128.00	200	120.00	0.06	0	0	0	PVC
702	P-147	J-129	J-140	62.00	150	120.00	0.89	0.05	0.002	0.035	PVC
703	P-129	J-122	J-123	62.00	200	120.00	-0.07	0	0	0	PVC
704	P-92	J-87	J-88	83.00	200	120.00	0.11	0	0	0	PVC
705	P-171	J-161	J-162	175.00	300	120.00	-2.03	0.03	0.001	0.005	PVC
706	P-206	J-196	J-197	78.00	300	120.00	-0.22	0	0	0	PVC
707	P-45	J-43	J-44	40.00	300	110.00	3.40	0.05	0.001	0.016	Asbestos Cement
708	P-258	PMP-101	J-234	2.00	150	120.00	0.00	0	0	0	PVC
709	P-276	J-248	J-211	11.00	300	120.00	5.38	0.08	0.001	0.035	PVC
710	P-189	J-179	J-180 (Dummy)	237.00	350	120.00	-1.29	0.01	0	0.001	PVC
711	P-33	J-31	J-32	76.00	300	110.00	-0.77	0.01	0	0.001	Asbestos Cement
712	P-84	J-79	J-80 (Dummy)	386.00	250	120.00	0.62	0.01	0.001	0.002	PVC
713	P-255	PMP-104	J-237	2.00	250	120.00	0.00	0	0	0	PVC
714	P-29	J-27	J-28	77.00	300	110.00	-1.85	0.03	0	0.006	Asbestos Cement
715	P-118	J-114	J-115	108.00	200	120.00	0.29	0.01	0	0.001	PVC
716	P-9	J-5	J-10	137.00	200	120.00	-0.39	0.01	0	0.002	PVC
718	P-229	J-217	J-218	31.00	300	120.00	-13.27	0.19	0.006	0.177	PVC
719	P-265	J-241	PMP-103	2.00	600	120.00	0.00	0	0	0	PVC
720	P-210	J-200	J-201	211.00	300	120.00	0.23	0	0	0	PVC
721	P-232	J-220	J-221	94.00	300	120.00	-1.05	0.01	0	0.002	PVC
722	P-32	J-30	J-31	86.00	300	110.00	-1.88	0.03	0.001	0.006	Asbestos Cement
723	P-108	J-96	J-105	160.00	200	120.00	0.05	0	0	0	PVC
724	P-133	J-126	J-127	125.00	150	120.00	0.27	0.02	0.001	0.004	PVC
725	P-174	J-164	J-165	87.00	300	120.00	-2.35	0.03	0.001	0.007	PVC
726	P-134	J-127	J-128	116.00	150	120.00	0.24	0.01	0	0.003	PVC
727	P-190	J-180 (Dummy)	J-181	119.00	350	120.00	-1.41	0.01	0	0.002	PVC
728	P-211	J-201	J-202	129.00	360	120.00	1.77	0.02	0	0.002	HDPE
729	P-300	OLD FIRE PUMP	J-265	145.00	300	120.00	0.00	0	0	0	PVC
730	P-144	J-122	J-137	191.00	200	120.00	-0.39	0.01	0	0.002	PVC
731	P-231	J-219	J-220	100.00	300	120.00	-0.97	0.01	0	0.001	PVC
732	P-70	J-65	J-66	106.00	300	110.00	-4.42	0.06	0.003	0.027	Asbestos Cement
733	P-35	J-33	J-34	60.00	300	110.00	-0.80	0.01	0	0.001	Asbestos Cement
734	P-117	J-113	J-114	51.00	200	120.00	-0.13	0	0	0	PVC
735	P-184	J-175	J-177	34.00	200	120.00	-0.14	0	0	0	PVC
736	P-112	J-108	J-109	88.00	200	120.00	-0.04	0	0	0	PVC
737	P-150	J-141	J-143	23.00	150	120.00	0.00	0	0	0	PVC
738	P-177	J-167	J-168	458.00	300	120.00	-0.76	0.01	0	0.001	PVC
739	P-115	J-97	Lakeshore	143.00	200	120.00	-0.08	0	0	0.001	PVC
740	P-192	J-182	J-183	257.00	350	120.00	-1.78	0.02	0.001	0.002	PVC
741	P-251	J-235	J-236	2.00	400	120.00	0.00	0	0	0	PVC
742	P-68	J-63	Acheson Zone 3	124.00	300	110.00	-4.34	0.06	0.003	0.026	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
743	P-309	J-469	J-468 (Dummy)	89.00	300	120.00	-1.10	0.02	0	0.002	PVC
744	P-146	J-128	J-139	63.00	150	120.00	0.03	0	0	0	PVC
745	P-97	J-93	J-94	73.00	200	120.00	-0.05	0	0	0	PVC
746	P-237	J-224	J-226	96.00	300	120.00	1.42	0.02	0	0.002	PVC
747	P-128	J-121	J-122	38.00	200	120.00	-0.44	0.01	0	0.003	PVC
748	P-22	J-21	J-22	200.00	300	110.00	-1.65	0.02	0.001	0.004	Asbestos Cement
749	P-122	J-117	J-118	130.00	200	120.00	-0.07	0	0	0	PVC
750	P-230	J-183	J-219	149.00	300	120.00	-0.94	0.01	0	0.001	PVC
751	P-104	J-100	J-101	111.00	200	120.00	0.10	0	0	0	PVC
753	P-61	J-57	J-58	116.00	300	110.00	-1.27	0.02	0	0.003	Asbestos Cement
754	P-126	J-114	J-120	75.00	200	120.00	-0.42	0.01	0	0.002	PVC
755	P-28	J-22	J-27	72.00	300	110.00	-1.83	0.03	0	0.005	Asbestos Cement
756	P-44	J-42	J-43	77.00	300	110.00	3.40	0.05	0.001	0.017	Asbestos Cement
757	P-197	J-187	J-188	74.00	300	120.00	0.77	0.01	0	0.001	PVC
758	P-20	J-19	J-20	49.00	300	110.00	-1.61	0.02	0	0.004	Asbestos Cement
759	P-80	J-75	J-76	179.00	200	120.00	-0.33	0.01	0	0.001	PVC
760	P-261	J-241	J-242	2.00	600	120.00	0.00	0	0	0	PVC
761	P-298	J-234	J-265	2.00	300	120.00	0.00	0	0	0	PVC
762	P-102	J-98	J-99	87.00	200	120.00	0.22	0.01	0	0.001	PVC
763	P-254	J-238	PMP-105	2.00	250	120.00	0.00	0	0	0	PVC
764	P-291	J-192	J-264	218.00	300	120.00	-0.82	0.01	0	0.001	PVC
765	P-281	J-14	J-259	44.00	300	120.00	3.01	0.04	0.001	0.011	PVC
766	P-64	J-60	J-40	31.00	300	110.00	4.79	0.07	0.001	0.033	Asbestos Cement
767	P-3	J-3	J-4	65.00	300	120.00	-0.99	0.01	0	0.002	PVC
768	P-83	J-78	J-79	214.00	250	120.00	0.62	0.01	0	0.001	PVC
769	P-14	J-14	J-15	120.00	300	110.00	-2.48	0.04	0.001	0.01	Asbestos Cement
770	P-58	J-54	J-55	167.00	300	110.00	-4.84	0.07	0.005	0.032	Asbestos Cement
771	P-55	J-51	J-52	57.00	300	110.00	-4.81	0.07	0.002	0.031	Asbestos Cement
772	P-167	J-157	J-158	22.00	250	120.00	-2.03	0.04	0	0.012	PVC
773	P-137	J-130	J-131	98.00	200	120.00	-0.81	0.03	0.001	0.007	PVC
774	P-105	J-101	J-102	98.00	200	120.00	0.06	0	0	0	PVC
775	P-101	J-97	J-98	173.00	200	120.00	0.25	0.01	0	0	PVC
776	P-188	J-178	J-179	247.00	350	120.00	-1.29	0.01	0	0.001	PVC
777	P-228	J-217	J-66	67.00	300	120.00	13.27	0.19	0.011	0.177	PVC
778	P-38	J-36	J-37	94.00	300	110.00	-2.56	0.04	0.001	0.009	Asbestos Cement
779	P-41	J-39	J-40	154.00	300	110.00	-2.57	0.04	0.002	0.01	Asbestos Cement
780	P-154	J-145	J-146	133.00	200	120.00	-1.17	0.04	0.002	0.014	PVC
781	P-63	J-59	J-60	123.00	300	110.00	4.79	0.07	0.004	0.031	Asbestos Cement
782	P-164	J-149	J-156	36.00	200	120.00	0.11	0	0	0	PVC
784	P-287	J-257	J-255	556.00	200	120.00	-0.07	0	0	0	HDPE
785	P-59	J-55	J-56 (Dummy)	74.00	300	110.00	-0.58	0.01	0	0.001	Asbestos Cement
786	P-243	J-231	J-73	144.00	200	120.00	0.37	0.01	0	0.002	PVC
787	P-264	J-242	PMP-102	2.00	600	120.00	0.00	0	0	0	PVC
788	P-7	J-7	J-8	371.00	300	120.00	-0.61	0.01	0	0.001	PVC
789	P-268	R-1	J-239	2.00	600	120.00	0.00	0	0	0	PVC
790	P-88	J-83	J-84	56.00	200	120.00	0.17	0.01	0	0.001	PVC
791	P-121	J-116	J-117	92.00	200	120.00	-0.03	0	0	0	PVC
792	P-79	J-74	J-75	142.00	200	120.00	-0.16	0.01	0	0.001	PVC
793	P-24	J-23	J-24	158.00	300	110.00	0.15	0	0	0	Asbestos Cement
794	P-47	J-45	J-46	103.00	300	110.00	2.23	0.03	0.001	0.008	Asbestos Cement
795	P-31	J-29	J-30	83.00	300	110.00	-1.86	0.03	0	0.005	Asbestos Cement
796	P-196	J-186	J-187	92.00	300	120.00	0.79	0.01	0	0.001	PVC
797	P-107	J-94	J-104	107.00	200	120.00	-0.35	0.01	0	0.002	PVC
799	P-161	J-152	J-153	68.00	200	120.00	0.14	0	0	0.001	PVC
800	P-250	J-234	J-235	2.00	400	120.00	0.00	0	0	0	PVC
801	P-136	J-129	J-130	187.00	200	120.00	-0.78	0.02	0.001	0.007	PVC
802	P-27	J-26	J-16	95.00	300	110.00	2.54	0.04	0.001	0.01	Asbestos Cement
803	P-173	J-163	J-164	99.00	300	120.00	-2.08	0.03	0.001	0.006	PVC
804	P-66	J-61	J-62	112.00	300	110.00	-4.30	0.06	0.003	0.026	Asbestos Cement
805	P-284	J-68	J-255	311.00	200	120.00	0.30	0.01	0	0.001	HDPE
806	P-257	PMP-102	J-235	2.00	150	120.00	0.00	0	0	0	PVC
807	P-218	J-207	J-208	408.00	300	120.00	1.18	0.02	0.001	0.002	PVC
808	P-239	J-227	J-228	96.00	300	120.00	1.40	0.02	0	0.003	PVC
809	P-18	J-18	J-8	31.00	300	110.00	0.55	0.01	0	0	Asbestos Cement
811	P-130	J-123	J-124	65.00	200	120.00	-0.08	0	0	0	PVC
812	P-143	J-136	J-126	89.00	200	120.00	0.39	0.01	0	0.002	PVC
813	P-93	J-88	J-89	68.00	200	120.00	0.07	0	0	0	PVC
814	P-207	J-197	J-198	121.00	300	120.00	0.22	0	0	0	PVC
815	P-149	J-141	J-142	40.00	150	120.00	0.00	0	0	0	PVC
816	P-259	J-239	J-240	2.00	600	120.00	0.00	0	0	0	PVC
817	P-34	J-32	J-33	60.00	300	110.00	-0.79	0.01	0	0.001	Asbestos Cement
818	P-85	J-80 (Dummy)	J-81	125.00	250	120.00	-0.06	0	0	0	PVC
819	P-256	PMP-103	J-236	2.00	200	120.00	0.00	0	0	0	PVC
820	P-183	J-174	J-175	119.00	200	120.00	-0.12	0	0	0.001	PVC
821	P-266	J-240	PMP-104	2.00	600	120.00	0.00	0	0	0	PVC
822	P-111	J-107	J-108	99.00	200	120.00	-0.03	0	0	0	PVC
823	P-308(2)	J-470	J-469	207.00	300	120.00	-1.10	0.02	0	0.002	PVC
824	P-233	J-221	J-222	79.00	300	120.00	-1.05	0.01	0	0.001	PVC
825	P-175	J-165	J-166	352.00	300	120.00	-2.58	0.04	0.003	0.009	PVC
826	P-53	J-50	J-31	149.00	300	110.00	1.11	0.02	0	0.002	Asbestos Cement
827	P-96	J-86	J-92	190.00	200	120.00	0.02	0	0	0	PVC
828	P-191	J-181	J-182	234.00	350	120.00	-1.53	0.02	0	0.001	PVC
831	P-145	J-138	J-128	73.00	150	120.00	0.00	0	0	0	PVC
832	P-273	J-218	J-246	35.00	300	120.00	-13.27	0.19	0.005	0.177	PVC
833	P-185	J-177	J-170	76.00	200	120.00	0.00	0	0	0	PVC
834	P-213	J-201	J-203	142.00	300	120.00	-1.54	0.02	0	0.003	PVC
835	P-114	J-110	J-111	107.00	200	120.00	0.05	0	0	0.001	PVC
836	P-178	J-168	J-169	64.00	300	120.00	-0.75	0.01	0	0.001	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
837	P-151	J-143	J-144	26.00	150	120.00	0.00	0	0	0	PVC
838	P-67	J-62	J-63	99.00	300	110.00	-4.30	0.06	0.003	0.026	Asbestos Cement
839	P-310(2)	J-468 (Dummy)	J-467	69.00	300	120.00	-1.78	0.03	0	0.004	PVC
840	P-42	J-40	J-41	91.00	300	110.00	3.43	0.05	0.002	0.017	Asbestos Cement
841	P-123	J-109	J-119	21.00	200	120.00	0.21	0.01	0	0	PVC
842	P-12	J-12	J-13	89.00	300	120.00	-0.52	0.01	0	0.001	PVC
843	P-127	J-120	J-121	205.00	200	120.00	-0.42	0.01	0	0.002	PVC
844	P-39	J-37	J-38	110.00	300	110.00	-2.57	0.04	0.001	0.01	Asbestos Cement
845	P-198	J-76	J-189	340.00	250	120.00	-0.95	0.02	0.001	0.003	PVC
846	P-21	J-20	J-21	62.00	300	110.00	-1.61	0.02	0	0.004	Asbestos Cement
847	P-252	J-236	J-237	2.00	400	120.00	0.00	0	0	0	PVC
848	P-81	J-76	J-77	87.00	250	120.00	0.62	0.01	0	0.001	PVC
849	P-293	J-264	J-261	179.00	300	120.00	-1.43	0.02	0	0.003	PVC
850	P-236	J-224	J-225	82.00	300	120.00	0.00	0	0	0	PVC
851	P-69	Acheson Zone 3	J-65	123.00	300	110.00	-4.42	0.06	0.003	0.027	Asbestos Cement
852	P-65	J-55	J-61	151.00	300	110.00	-4.29	0.06	0.004	0.026	Asbestos Cement
853	P-4	J-4	J-5	124.00	300	120.00	-0.99	0.01	0	0.001	PVC
854	P-168	J-158	J-159	265.00	300	120.00	-2.03	0.03	0.001	0.006	PVC
855	P-56	J-52	J-53	70.00	300	110.00	-4.81	0.07	0.002	0.032	Asbestos Cement
856	P-139	J-132	J-133	106.00	200	120.00	0.31	0.01	0	0.001	PVC
857	P-36	J-34	J-35	61.00	300	110.00	-0.80	0.01	0	0.001	Asbestos Cement
858	P-103	J-99	J-100	157.00	200	120.00	0.16	0	0	0	PVC
859	P-98	J-94	J-95	59.00	200	120.00	0.30	0.01	0	0.001	PVC
860	P-116	Lakeshore	J-113	107.00	200	120.00	-0.13	0	0	0	PVC
861	P-305(2)	J-262	J-472	275.00	300	120.00	-0.91	0.01	0	0.001	PVC
863	P-165	J-156	J-152	29.00	200	120.00	0.11	0	0	0	PVC
864	P-221	J-210	J-211	208.00	300	120.00	-5.38	0.08	0.007	0.033	PVC
865	P-60	J-56 (Dummy)	J-57	133.00	300	110.00	-1.27	0.02	0	0.002	Asbestos Cement
866	P-244	J-135	J-232	151.00	200	120.00	-0.23	0.01	0	0.001	PVC
867	P-106	J-102	J-103	82.00	200	120.00	0.03	0	0	0	PVC
868	P-269	J-35	J-244	73.00	350	120.00	6.51	0.07	0.001	0.025	PVC
869	P-89	J-84	J-85	64.00	200	120.00	0.16	0.01	0	0	PVC
870	P-25	J-24	J-25 (Dummy)	124.00	300	110.00	0.15	0	0	0	Asbestos Cement
871	P-23	J-22	J-23	47.00	300	110.00	0.16	0	0	0	Asbestos Cement
872	P-37	J-35	J-36	106.00	300	110.00	-2.56	0.04	0.001	0.01	Asbestos Cement
873	P-43	J-41	J-42	45.00	300	110.00	3.41	0.05	0.001	0.017	Asbestos Cement
874	P-19	J-18	J-19	89.00	300	110.00	-1.61	0.02	0	0.004	Asbestos Cement
876	P-77	J-70	J-73	144.00	200	120.00	-0.46	0.01	0	0.003	PVC
877	P-94	J-89	J-90	141.00	200	120.00	0.05	0	0	0	PVC
878	P-260	J-240	J-241	2.00	600	120.00	0.00	0	0	0	PVC
879	P-267	J-239	PMP-105	2.00	600	120.00	0.00	0	0	0	PVC
880	P-297	J-243	OLD FIRE PUMP	4.00	500	120.00	0.00	0	0	0	PVC
881	P-253	J-237	J-238	2.00	400	120.00	0.00	0	0	0	PVC
882	P-186	J-176	J-177	48.00	200	120.00	0.14	0	0	0	PVC
883	P-86	J-81	J-82	220.00	200	120.00	0.17	0.01	0	0	PVC
884	P-274	J-246	J-247	370.00	300	120.00	5.38	0.08	0.012	0.033	PVC
885	P-214	J-203	J-204	29.00	300	120.00	-1.61	0.02	0	0.005	PVC
886	P-311(2)	J-467	J-466	82.00	300	120.00	-1.90	0.03	0	0.005	PVC
887	P-194	J-184	J-185	66.00	300	120.00	0.91	0.01	0	0.001	PVC
888	P-40	J-38	J-39	44.00	300	110.00	-2.57	0.04	0	0.01	Asbestos Cement
889	P-199	J-189	J-190	318.00	300	120.00	-1.52	0.02	0.001	0.003	PVC
890	P-162	J-153	J-154	39.00	200	120.00	0.11	0	0	0	PVC
891	P-82	J-77	J-78	43.00	250	120.00	0.62	0.01	0	0.002	PVC
892	P-54	J-35	J-51	62.00	300	110.00	-4.74	0.07	0.002	0.031	Asbestos Cement
893	P-57	J-53	J-54	91.00	300	110.00	-4.84	0.07	0.003	0.032	Asbestos Cement
894	P-99	J-95	J-96	66.00	200	120.00	0.29	0.01	0	0	PVC
895	P-166	J-147	J-157	23.00	200	120.00	-2.02	0.06	0.001	0.041	PVC
896	P-222	J-211	J-212	47.00	300	120.00	0.00	0	0	0	PVC
897	P-245	J-133	J-233	76.00	200	120.00	0.04	0	0	0	PVC
898	P-1	J-1	J-2	158.00	300	120.00	-0.79	0.01	0	0.001	PVC
899	P-90	J-85	J-86	140.00	200	120.00	0.16	0.01	0	0	PVC
900	P-13	J-13	J-14	30.00	300	110.00	0.53	0.01	0	0.001	Asbestos Cement
901	P-48	J-46	J-47	139.00	300	110.00	2.23	0.03	0.001	0.008	Asbestos Cement
903	P-155	J-146	J-147	23.00	200	120.00	-1.17	0.04	0	0.014	PVC
904	P-302(2)	J-259	J-461	628.00	300	120.00	2.89	0.04	0.004	0.011	PVC
905	P-240	J-208	J-230	357.00	300	120.00	-0.81	0.01	0	0.001	PVC
906	P-187	J-168	J-178	363.00	350	120.00	-1.23	0.01	0	0.001	PVC
907	P-262	J-242	J-243	2.00	600	120.00	0.00	0	0	0	PVC
908	P-275	J-247	J-248	75.00	300	120.00	5.38	0.08	0.002	0.033	PVC
909	P-312(2)	J-466	J-465	94.00	300	120.00	-1.90	0.03	0	0.005	PVC
910	P-153	J-145	J-132	114.00	200	120.00	0.33	0.01	0	0.001	PVC
911	P-62	J-58	J-59	127.00	300	110.00	5.40	0.08	0.005	0.039	Asbestos Cement
912	P-163	J-154	J-155	61.00	200	120.00	0.08	0	0	0	PVC
913	P-208	J-198	J-199	68.00	300	120.00	0.01	0	0	0	PVC
914	P-100	J-96	J-97	141.00	200	120.00	0.21	0.01	0	0.001	PVC
915	P-91	J-86	J-87	166.00	200	120.00	0.11	0	0	0	PVC
916	P-49	J-47	J-26	98.00	300	110.00	2.23	0.03	0.001	0.007	Asbestos Cement
917	P-314(2)	J-464	J-230	207.00	300	120.00	0.82	0.01	0	0.001	PVC
918	P-242	J-229	J-230	45.00	250	120.00	-0.01	0	0	0	PVC
919	P-6	J-7	J-6	24.00	200	120.00	0.01	0	0	0	PVC
920	P-263	J-243	PMP-101	2.00	600	120.00	0.00	0	0	0	PVC
921	P-2	J-2	J-3	142.00	300	120.00	-0.90	0.01	0	0.001	PVC
922	P-180	J-171	J-172	67.00	200	120.00	0.01	0	0	0	PVC
923	P-50	J-44	J-48	97.00	300	110.00	1.15	0.02	0	0.002	Asbestos Cement
924	P-169	J-159	J-160	124.00	300	120.00	-2.03	0.03	0.001	0.005	PVC
925	P-315(2)	J-465	J-464	45.00	300	120.00	-1.90	0.03	0	0.003	PVC
926	P-87	J-82	J-83	149.00	200	120.00	0.17	0.01	0	0.001	PVC
927	P-51	J-48	J-49	123.00	300	110.00	1.15	0.02	0	0.002	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
928	P-170	J-160	J-161	104.00	300	120.00	-2.03	0.03	0.001	0.006	PVC
929	P-179	J-163	J-171	113.00	200	120.00	0.05	0	0	0	PVC
930	P-113	J-231	J-125	185.00	200	120.00	-0.37	0.01	0	0.002	PVC
931	P-203	J-125	J-209	180.00	200	120.00	0.03	0	0	0	PVC
932	P-204	J-125	J-214	107.00	200	120.00	0.00	0	0	0	PVC
933	P-205	J-193	J-215	201.00	300	120.00	0.00	0	0	0	PVC
934	P-219	J-26	J-216	167.00	200	110.00	-0.85	0.03	0.001	0.009	Asbestos Cement
935	P-303	J-193	J-274	39.00	300	120.00	-0.50	0.01	0	0.002	PVC
936	P-305	J-274	J-194	198.00	200	120.00	0.03	0	0	0	PVC
937	P-306	J-189	J-274	249.00	300	120.00	0.52	0.01	0	0	PVC
938	P-307	J-228	J-275	314.00	300	120.00	1.34	0.02	0	0.002	PVC
940	P-310	J-188	J-276	110.00	300	120.00	0.77	0.01	0	0.001	PVC
941	P-311	J-276	J-182	265.00	300	120.00	-0.21	0	0	0	PVC
942	P-312	J-276	J-277	170.00	300	120.00	0.97	0.01	0	0.002	PVC
944	P-314	J-278	J-279 (Dummy)	172.00	300	120.00	-18.65	0.26	0.059	0.332	PVC
945	P-315	J-279 (Dummy)	J-280	255.00	300	120.00	-19.33	0.27	0.081	0.355	PVC
946	P-413	J-369	J-9	217.00	300	120.00	-1.30	0.02	0	0.003	PVC
947	P-463	J-119	J-413	36.00	150	120.00	0.12	0.01	0	0.002	PVC
948	P-464	J-413	J-118	118.00	200	120.00	0.12	0	0	0	PVC
949	P-466	J-414	J-263	264.00	300	120.00	1.91	0.03	0.001	0.005	PVC
950	P-467	J-8	J-415	209.00	300	120.00	-0.09	0	0	0	PVC
952	P-469	J-262	J-416	50.00	300	120.00	1.91	0.03	0	0.005	PVC
953	P-470	J-416	J-414	71.00	300	120.00	1.91	0.03	0	0.005	PVC
954	P-471	J-244	J-417	188.00	600	120.00	6.51	0.02	0.001	0.001	HDPE
955	P-472	J-417	J-418	70.00	600	120.00	5.06	0.02	0	0.001	PVC
956	P-483	J-216	J-426	467.00	200	110.00	-0.85	0.03	0.004	0.009	Asbestos Cement
957	P-485	J-427	J-66	310.00	200	110.00	-2.17	0.07	0.016	0.053	Asbestos Cement
958	P-491	R-3	J-432	2.00	350	120.00	19.54	0.2	0	0.186	PVC
959	P-492	J-432	PMP-1	2.00	350	120.00	19.54	0.2	0	0.149	PVC
960	P-493	PMP-1	J-281	2.00	350	120.00	19.54	0.2	0	0.186	PVC
961	P-494	J-238	PRV-4	3.00	350	120.00	0.00	0	0	0	PVC
962	P-495	PRV-4	J-244	3.00	350	120.00	0.00	0	0	0	PVC
963	P-496	PRV-5	J-280	37.00	400	120.00	19.54	0.16	0.011	0.089	PVC
964	P-497	J-281	PRV-5	2.00	400	120.00	19.54	0.16	0	0.074	PVC
965	P-500	J-433	J-427	244.00	200	110.00	-2.07	0.07	0.012	0.048	Asbestos Cement
966	P-501	J-40	J-433	147.00	300	110.00	-1.21	0.02	0	0.003	Asbestos Cement
967	P-502	J-225	J-317	106.00	300	120.00	0.00	0	0	0	PVC
968	P-529	J-461	J-542	318.00	300	120.00	2.87	0.04	0.001	0.011	PVC
971	P-536	J-202	J-183	115.00	350	120.00	1.77	0.02	0	0.002	PVC
972	P-597	J-232	J-455	163.00	200	120.00	0.01	0	0	0	PVC
973	P-598	J-137	J-456	53.00	200	120.00	-0.43	0.01	0	0.003	PVC
974	P-599	J-456	J-457	147.00	200	120.00	0.44	0.01	0	0.003	PVC
975	P-600	J-457	J-458	105.00	200	120.00	0.01	0	0	0	PVC
976	P-601	J-458	J-459	75.00	200	120.00	0.00	0	0	0	PVC
977	P-602	J-457	J-460	112.00	200	120.00	0.01	0	0	0	PVC
978	P-603	J-457	J-462	99.00	200	120.00	0.40	0.01	0	0.002	PVC
979	P-604	J-462	J-473	83.00	200	120.00	0.40	0.01	0	0.002	PVC
982	P-607	J-263	J-261	199.00	300	120.00	1.91	0.03	0.001	0.005	PVC
983	P-608	J-263	J-474	104.00	300	120.00	0.00	0	0	0	PVC
984	P-609	J-155	J-475	48.00	200	120.00	0.06	0	0	0	PVC
985	P-610	J-475	J-476	99.00	200	120.00	0.06	0	0	0	PVC
986	P-611	J-476	J-477	118.00	200	120.00	0.06	0	0	0	PVC
987	P-612	J-477	J-478	106.00	200	120.00	0.02	0	0	0	PVC
988	P-613	J-478	J-479	100.00	200	120.00	0.02	0	0	0	PVC
989	P-614	J-479	J-480	106.00	200	120.00	0.02	0	0	0	PVC
990	P-615	J-478	Country Squire	134.00	200	120.00	0.00	0	0	0	PVC
991	P-616	Country Squire	J-482	51.00	200	120.00	0.00	0	0	0	PVC
992	P-617	J-483	J-88	77.00	200	120.00	0.00	0	0	0	PVC
993	P-618	J-255	J-484	74.00	300	120.00	0.12	0	0	0	PVC
994	P-619	J-484	J-485	90.00	300	120.00	0.12	0	0	0	PVC
995	P-620	J-485	Greenbriar	149.00	300	120.00	0.11	0	0	0	PVC
996	P-621	Greenbriar	J-487	95.00	300	120.00	0.07	0	0	0	PVC
997	P-622	J-487	J-488	146.00	300	120.00	0.05	0	0	0	PVC
998	P-623	J-488	J-489	137.00	300	120.00	0.05	0	0	0	PVC
999	P-624	J-489	J-490	161.00	300	120.00	0.05	0	0	0	PVC
1000	P-625	J-490	J-491	59.00	300	120.00	0.05	0	0	0	PVC
1001	P-626	J-472	J-492	200.00	300	120.00	0.19	0	0	0	PVC
1003	P-628	J-493	J-494	221.00	300	120.00	0.18	0	0	0	PVC
1004	P-631	J-496	J-701	290.00	300	120.00	0.18	0	0	0	PVC
1006	P-633	J-494	J-496	395.00	300	120.00	0.18	0	0	0	PVC
1007	P-634	J-256	J-499	159.00	200	120.00	0.03	0	0	0	HDPE
1008	P-635	J-125	J-500	208.00	200	120.00	-0.44	0.01	0	0.002	PVC
1009	P-636	J-500	J-193	123.00	200	120.00	-0.47	0.01	0	0.002	PVC
1012	P-639	J-75	J-502	104.00	200	120.00	0.12	0	0	0	PVC
1013	P-640	J-502	J-503	95.00	200	120.00	0.10	0	0	0	PVC
1014	P-641	J-503	J-504	118.00	200	120.00	0.07	0	0	0.001	PVC
1015	P-642	J-504	J-505	103.00	200	120.00	0.04	0	0	0	PVC
1016	P-643	J-75	J-506	84.00	200	120.00	0.06	0	0	0	PVC
1017	P-644	J-506	J-507	147.00	200	120.00	0.03	0	0	0	PVC
1018	P-533	J-426	J-433	198.00	200	110.00	-0.85	0.03	0.002	0.009	Asbestos Cement
1021	P-439	J-513	J-167	152.00	300	120.00	-2.58	0.04	0.001	0.009	HDPE
1023	P-441	J-148	J-338	252.00	200	120.00	0.62	0.02	0.001	0.004	PVC
1024	P-443	J-339	J-232	126.00	200	120.00	0.24	0.01	0	0.001	PVC
1025	P-445	J-340	J-341	74.00	200	120.00	0.00	0	0	0	PVC
1026	P-446	J-338	J-342	79.00	200	120.00	0.62	0.02	0	0.004	PVC
1027	P-447	J-342	J-340	138.00	200	120.00	0.44	0.01	0	0.003	PVC
1028	P-448	J-342	J-343	127.00	200	120.00	0.18	0.01	0	0.001	PVC
1029	P-449	J-343	J-344	109.00	200	120.00	0.05	0	0	0	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1030	P-450	J-344	J-345	88.00	200	120.00	0.05	0	0	0	PVC
1031	P-451	J-345	J-346	107.00	200	120.00	0.00	0	0	0	PVC
1032	P-452	J-255	J-347	531.00	300	120.00	0.09	0	0	0	PVC
1034	P-454	J-347	J-348	255.00	200	120.00	0.07	0	0	0	PVC
1036	P-456	J-349	J-350	241.00	250	120.00	-0.05	0	0	0	PVC
1037	P-457	J-350	J-351	254.00	250	120.00	-0.05	0	0	0	PVC
1038	P-458	J-351	J-352	307.00	250	120.00	-0.05	0	0	0	PVC
1039	P-459	J-352	J-353	190.00	250	120.00	-0.05	0	0	0	PVC
1040	P-460	J-353	J-491	195.00	250	120.00	-0.05	0	0	0	PVC
1057	P-499	J-511	J-372	586.00	250	120.00	-0.23	0	0	0	PVC
1058	P-504	J-176	J-373	101.00	200	120.00	-0.27	0.01	0	0.001	PVC
1059	P-505	J-373	J-374	144.00	200	120.00	-0.27	0.01	0	0.001	PVC
1060	P-506	J-374	J-375	147.00	200	120.00	-0.27	0.01	0	0.001	PVC
1061	P-507	J-375	J-164	158.00	200	120.00	-0.27	0.01	0	0.001	PVC
1069	P-517	J-473	J-104	80.00	200	120.00	0.40	0.01	0	0.002	PVC
1103	P-573	J-424	J-425	398.00	300	120.00	2.86	0.04	0.003	0.01	PVC
1107	P-577	J-206	J-224	304.00	322	120.00	2.55	0.03	0.002	0.006	HDPE
1118	P-590	J-340	J-437	148.00	200	120.00	0.34	0.01	0	0.002	PVC
1119	P-591	J-437	J-339	102.00	200	120.00	0.28	0.01	0	0.001	PVC
1143	P-678	J-511	J-510	93.00	250	120.00	0.23	0	0	0	PVC
1158	P-693	J-169	J-388	745.00	300	120.00	-0.75	0.01	0	0.001	PVC
1162	P-697	J-446	PMP-2	2.00	350	120.00	0.00	0	0	0	PVC
1163	P-698	PMP-2	J-447	2.00	350	120.00	0.00	0	0	0	PVC
1169	P-705	J-449	J-208	166.00	300	120.00	-1.99	0.03	0.001	0.005	PVC
1171	P-707	Supreme Steel	J-450	178.00	410	120.00	-0.53	0	0	0	HDPE
1172	P-708	J-450	J-1	334.00	400	120.00	-0.53	0	0	0	PVC
1174	P-710	J-343	J-452	68.00	200	120.00	0.07	0	0	0	PVC
1175	P-711	J-437	J-453	67.00	200	120.00	0.06	0	0	0	PVC
1186	P-723	J-418	J-495	222.00	600	120.00	5.06	0.02	0	0.001	PVC
1190	P-727	J-514	J-417	673.00	300	120.00	-1.44	0.02	0.001	0.003	PVC
1203	P-735	J-449	J-515	810.00	250	120.00	0.77	0.02	0.001	0.002	PVC
1206	P-737	J-425	J-516	666.00	300	120.00	2.86	0.04	0.002	0.01	PVC
1211	P-740	J-424	J-518	0.00	300	120.00	0.00	0	0	0	PVC
1213	P-741	J-390	J-519	897.00	400	120.00	0.00	0	0	0	PVC
1216	P-743	J-373	J-520	0.00	200	120.00	0.00	0	0	0	PVC
1218	P-744	J-348	J-521	448.00	200	120.00	-0.01	0	0	0	PVC
1219	P-745	J-521	J-349	448.00	200	120.00	-0.01	0	0	0	PVC
1222	P-746	J-521	J-523	0.00	200	120.00	0.00	0	0	0	PVC
1224	P-747	J-349	J-524	0.00	250	120.00	0.00	0	0	0	PVC
1226	P-748	J-351	J-525	0.00	200	120.00	0.00	0	0	0	PVC
1248	P-754	J-495	J-529	560.00	250	120.00	0.46	0.01	0	0.001	PVC
1251	P-756	J-529	J-530	0.00	250	120.00	0.46	0.01	0	0.001	PVC
1253	P-757	J-530	J-531	0.00	250	120.00	0.46	0.01	0	0.001	PVC
1255	P-758	J-531	J-532	0.00	250	120.00	0.46	0.01	0	0.001	PVC
1256	P-759	J-532	J-390	0.00	250	120.00	0.46	0.01	0	0.001	PVC
1257	P-760	J-390	J-495	0.00	600	120.00	-4.61	0.02	0.001	0.001	PVC
1262	P-762	PRV-A	J-535	185.00	300	120.00	2.87	0.04	0.001	0.011	PVC
1263	P-763	J-535	Panattoni	185.00	300	120.00	2.87	0.04	0.002	0.01	PVC
1280	P-773	J-542	PRV-A	0.00	300	120.00	2.87	0.04	0.001	0.01	PVC
1304	P-789	J-1	J-550	0.00	350	120.00	0.09	0	0	0	PVC
1309	P-792	J-82	J-552	0.00	200	120.00	0.00	0	0	0	PVC
1311	P-793	J-345	J-553	288.00	200	120.00	0.00	0	0	0	PVC
1314	P-795	J-197	J-554	247.00	300	120.00	-0.45	0.01	0	0	PVC
1315	P-796	J-554	J-200	247.00	300	120.00	-0.49	0.01	0	0	PVC
1316	P-797	J-261	J-554	0.00	200	120.00	-0.05	0	0	0	PVC
1318	P-798	J-261	J-555	401.00	300	120.00	0.53	0.01	0	0	PVC
1319	P-799	J-555	J-196	401.00	300	120.00	-0.17	0	0	0	PVC
1324	P-801	J-555	J-558	0.00	200	120.00	0.00	0	0	0	PVC
1325	P-802	J-558	J-556	0.00	200	120.00	0.00	0	0	0	PVC
1326	P-803	J-557	J-558	0.00	200	120.00	0.00	0	0	0	PVC
1331	P-806	J-168	J-560	1,219.00	350	120.00	0.12	0	0	0	PVC
1334	P-808	J-246	J-561	359.00	322	120.00	-18.65	0.23	0.043	0.235	HDPE
1335	P-809	J-561	J-278	359.00	300	120.00	-18.65	0.26	0.057	0.333	PVC
1337	P-810	J-277	J-562	362.00	300	120.00	1.07	0.02	0	0.002	PVC
1338	P-811	J-562	J-451	362.00	300	120.00	1.06	0.02	0	0.001	PVC
1340	P-812	J-451	J-563	0.00	300	120.00	0.98	0.01	0	0.001	PVC
1343	P-814	J-563	J-564	0.00	300	120.00	0.72	0.01	0	0.001	PVC
1344	P-815	J-564	J-167	0	300	120	0.72	0.01	0	0.001	PVC
1346	P-816	J-275	J-565	618	300	120	0.76	0.01	0	0.001	PVC
1347	P-817	J-565	J-180 (Dummy)	618	300	120	0.57	0.01	0	0.001	PVC
1349	P-818	J-275	J-566	785	300	120	0.58	0.01	0	0.001	PVC
1350	P-819	J-614	J-388	785	300	120	0.75	0.01	0.001	0.001	PVC
1352	P-820	J-566	J-567	0	300	120	0.01	0	0	0	PVC
1354	P-821	J-262	J-568	797	300	120	-1.01	0.01	0.001	0.002	PVC
1355	P-822	J-568	J-449	797	300	120	-1.01	0.01	0.001	0.001	PVC
1357	P-823	Panattoni	J-569	726	300	120	2.72	0.04	0.001	0.01	PVC
1361	P-826	J-570	J-464	726	300	120	2.72	0.04	0.002	0.01	PVC
1364	P-828	J-571	J-570	726	300	120	2.72	0.04	0.001	0.01	PVC
1368	P-830	J-573	Supreme Steel	1,001	400	120	-0.53	0	0	0	PVC
1374	P-834	J-575	J-369	589	300	120	-1.27	0.02	0	0.002	PVC
1376	P-835	J-424	J-576	899	400	120	2.1	0.02	0	0.002	PVC
1388	P-838	J-569	J-578	726	300	120	2.72	0.04	0.002	0.009	PVC
1389	P-839	J-578	J-571	726	300	120	2.72	0.04	0.001	0.009	PVC
1391	P-840	J-497	J-579	41	300	120	0	0	0	0	PVC
1392	P-841	J-579	J-498	41	300	120	0	0	0	0	PVC
1406	P-848	J-576	J-586	899	400	120	1.65	0.01	0	0.001	PVC
1453	P-873	J-347	J-602	818	300	120	0.02	0	0	0	PVC
1454	P-874	J-602	J-252	818	300	120	0.02	0	0	0	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1474	P-884	J-481	J-607	0	300	120	0	0	0	0	PVC
1476	P-885	J-508	J-608	503	300	120	-0.36	0.01	0	0	PVC
1479	P-887	J-608	J-609	0	300	120	0	0	0	0	PVC
1481	P-888	J-391 (Dummy)	J-610	624	400	120	0.94	0.01	0	0	PVC
1482	P-889	J-610	J-508	624	300	120	0.75	0.01	0	0.001	PVC
1484	P-890	J-415	J-611	176	300	120	-0.09	0	0	0	PVC
1485	P-891	J-611	J-9	176	300	120	-0.09	0	0	0	PVC
1491	P-895	J-432	J-447	0	350	120	0	0	0	0	PVC
1493	P-896	J-446	CV-2	1	350	120	0	0	0	0	PVC
1494	P-897	CV-2	J-281	1	350	120	0	0	0	0	PVC
1505	P-904	J-565	J-614	0	300	120	0.19	0	0	0	PVC
1506	P-905	J-614	J-566	0	300	120	-0.56	0.01	0	0	PVC
1560	P-933	J-508	J-629	1,206	400	120	2.38	0.02	0.001	0.002	PVC
1561	P-934	J-629	J-628	1,206	400	120	2.38	0.02	0.001	0.002	PVC
1620	P-954	J-628	J-634	906	400	120	2.38	0.02	0	0.002	PVC
1682	P-967	J-516	J-642	666	400	120	2.86	0.02	0	0.002	PVC
1683	P-968	J-642	J-393	666	400	120	2.86	0.02	0	0.002	PVC
1743	P-540(2)	J-647	J-393	848	400	120	1.68	0.01	0	0.001	PVC
1745	P-974	J-647	J-648 (Dummy)	0	300	120	0.18	0	0	0	PVC
1747	P-975	J-648 (Dummy)	J-649	0	300	120	-0.51	0.01	0	0	PVC
1749	P-540(1)(1)	J-392	J-650	848	400	120	2.37	0.02	0.001	0.002	PVC
1750	P-540(1)(2)	J-650	J-647	848	400	120	1.86	0.01	0	0.001	PVC
1751	P-976	J-649	J-650	0	300	120	-0.51	0.01	0	0	PVC
1794	P-691(1)	J-166	J-651	105	350	120	-2.58	0.03	0	0.004	PVC
1795	P-691(2)	J-651	PRV-2i	1	76	120	-2.58	0.57	0.007	6.846	PVC
1797	P-438(1)	PRV-2i	J-652	1	76	120	-2.58	0.57	0.007	6.846	PVC
1798	P-438(2)	J-652	J-513	118	350	120	-2.58	0.03	0	0.004	PVC
1807	P-531(1)	J-207	J-653	39	300	120	-5.34	0.08	0.001	0.032	PVC
1808	P-531(2)	J-653	PRV-Bi	1	100	120	-5.34	0.68	0.007	6.921	PVC
1810	P-532(1)	PRV-Bi	J-654	1	100	120	-5.34	0.68	0.007	6.921	PVC
1811	P-532(2)	J-654	J-210	144	300	120	-5.34	0.08	0.005	0.033	PVC
1816	P-246(1)	J-190	J-655	43	300	120	-1.52	0.02	0	0.003	PVC
1817	P-246(2)	J-655	PRV-1i	1	76	120	-1.52	0.33	0.003	2.53	PVC
1819	P-247(1)	PRV-1i	J-656	1	76	120	-1.52	0.33	0.003	2.604	PVC
1820	P-247(2)	J-656	J-191	166	265	120	-1.52	0.03	0.001	0.006	HDPE
1825	P-605(1)	J-456	J-657	123	200	120	-0.87	0.03	0.001	0.008	PVC
1826	P-605(2)	J-657	PRV-21i	1	76	120	-0.87	0.19	0.001	0.967	PVC
1828	P-606(1)	PRV-21i	J-658	1	76	120	-0.87	0.19	0.001	0.893	PVC
1829	P-606(2)	J-658	J-140	37	200	120	-0.87	0.03	0	0.008	PVC
1834	P-131(1)	J-124	J-659	15	200	120	-0.08	0	0	0	PVC
1835	P-131(2)	J-659	PRV-3i	1	50	120	-0.08	0.04	0	0.074	PVC
1837	P-132(1)	PRV-3i	J-660	1	50	120	-0.08	0.04	0	0.074	PVC
1838	P-132(2)	J-660	J-126	64	200	120	-0.08	0	0	0	PVC
1858	P-989	J-83	J-662	0	200	120	0	0	0	0	PVC
1860	P-990	J-85	J-663	0	200	120	0	0	0	0	PVC
1861	P-991	J-277	J-181	0	300	120	-0.11	0	0	0	PVC
1883	P-854(1)	J-589	J-666	120	250	120	-0.23	0	0	0	PVC
1884	P-854(2)	J-666	PRV-19i	1	76.2	120	-0.23	0.05	0	0.074	PVC
1886	P-680(1)	PRV-19i	J-667	1	76.2	120	-0.23	0.05	0	0.074	PVC
1887	P-680(2)	J-667	J-165	61	250	120	-0.23	0	0	0	PVC
1931	P-790(1)	J-550	J-668	0	350	120	0.09	0	0	0	PVC
1932	P-790(2)	J-668	J-454	0	350	120	0.09	0	0	0	PVC
1950	P-831(1)	J-481	J-675	1,001	400	120	-0.48	0	0	0	PVC
1951	P-831(2)	J-675	J-574	1,001	400	120	-0.48	0	0	0	PVC
1953	P-886(1)	J-608	J-676	503	400	120	-0.36	0	0	0	PVC
1954	P-886(2)	J-676	J-481	503	400	120	-0.36	0	0	0	PVC
1966	P-490(1)	J-253	J-682	280	200	120	0	0	0	0	PVC
1967	P-490(2)	J-682	J-371	280	200	120	0	0	0	0	PVC
1975	P-627(1)	J-492	J-685	233	300	120	0.18	0	0	0	PVC
1976	P-627(2)	J-685	J-493	233	300	120	0.18	0	0	0	PVC
1981	P-833(1)	J-508	J-687	589	300	120	-1.27	0.02	0.001	0.002	PVC
1982	P-833(2)	J-687	J-575	589	300	120	-1.27	0.02	0	0.002	PVC
1984	P-725(1)	J-9	J-688	642	300	120	-1.4	0.02	0.001	0.002	PVC
1985	P-725(2)	J-688	J-514	642	300	120	-1.4	0.02	0.001	0.003	PVC
1987	P-849(1)	J-586	J-689	899	400	120	1.62	0.01	0	0.001	PVC
1988	P-849(2)	J-689	J-391 (Dummy)	899	400	120	1.62	0.01	0	0.001	PVC
1990	P-428(1)	J-81	J-690	1,571	250	120	-0.23	0	0	0	PVC
1991	P-428(2)	J-690	J-510	1,571	250	120	-0.23	0	0	0	PVC
1993	P-853(1)	J-372	J-691	581	250	120	-0.23	0	0	0	PVC
1994	P-853(2)	J-691	J-589	581	250	120	-0.23	0	0	0	PVC
1996	P-286(1)	J-256	J-692	219	200	120	-0.06	0	0	0	HDPE
1997	P-286(2)	J-692	J-257	219	200	120	-0.06	0	0	0	HDPE
1999	P-76(1)	J-71	J-693	166	200	120	0.03	0	0	0	PVC
2000	P-76(2)	J-693	J-72	166	200	120	0.03	0	0	0	PVC
2003	P-988(2)	J-694	J-200	0	200	120	0.72	0.02	0.001	0.006	PVC
2005	P-988(1)(1)	J-515	J-695	0	200	120	0.72	0.02	0.001	0.006	PVC
2006	P-988(1)(2)	J-695	J-694	0	200	120	0.72	0.02	0.001	0.006	PVC
2010	P-956(1)	J-392	J-697	0	400	120	-2.38	0.02	0	0.002	PVC
2011	P-956(2)	J-697	J-634	0	400	120	-2.38	0.02	0	0.002	PVC
2013	P-832(1)	J-574	J-698	1,001	400	120	-0.48	0	0	0	PVC
2014	P-832(2)	J-698	J-573	1,001	400	120	-0.48	0	0	0	PVC
2016	P-571(1)	J-390	J-699	201	400	120	4.98	0.04	0.001	0.007	PVC
2017	P-571(2)	J-699	J-424	201	400	120	4.98	0.04	0.001	0.007	PVC
2026	P-948(2)	J-701	J-497	0	300	120	0.18	0	0	0	PVC
2049	P-900(1)	J-560	J-709	1,219	350	120	0	0	0	0	PVC
2050	P-900(2)	J-709	J-613	1,219	350	120	0	0	0	0	PVC
2146	P-687(1)(1)	J-393	J-720	807	400	120	0	0	0	0	PVC
2147	P-687(1)(2)	J-720	J-719	807	360	130	0	0	0	0	HDPE

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
2149	P-1029	J-111	J-721	0	200	120	0	0	0	0	PVC
2150	P-1030	J-168	J-167	0	350	120	1.11	0.01	0	0.001	PVC
2154	P-1032	J-555	J-723	0	300	120	0.7	0.01	0	0.001	PVC
2156	P-1033	J-723	J-724	0	300	120	0.7	0.01	0	0.001	PVC
2158	P-1034	J-724	J-725	0	300	120	0.7	0.01	0	0.001	PVC
2159	P-1035	J-725	J-192	0	300	120	0.7	0.01	0	0.001	PVC

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
185	J-160	TRUE	60	175.78	60	175.78	45.9	21.8	J-480
186	J-222	TRUE	230	313.31	230	313.31	27.9	21.8	J-317
187	J-162	TRUE	60	200.09	60	200.09	36	21.8	J-480
188	J-138	TRUE	60	87.4	60	87.4	21.8	35.5	J-346
189	J-192	TRUE	230	350	230	350	32.1	23.7	J-567
190	J-119	TRUE	60	107.23	60	107.23	28.8	21.8	J-111
191	J-134	TRUE	60	122.19	60.05	122.23	23.3	21.8	J-346
192	J-67	TRUE	230	350	230.01	350.01	59.4	50.1	J-372
193	J-38	TRUE	230	350	230.01	350.01	57.7	49.7	J-697
194	J-41	TRUE	230	350	230.02	350.02	59.3	49.6	J-697
195	J-144	TRUE	60	85.07	60	85.07	21.8	27.6	J-143
196	J-37	TRUE	230	350	230.01	350.01	58.4	49.6	J-697
197	J-472	TRUE	230	350	230	350	35.2	28.8	J-229
198	J-201	TRUE	230	325.83	230	325.83	46.2	21.8	J-567
199	J-91	TRUE	60	66.69	60	66.69	21.8	22.3	J-90
200	J-103	TRUE	60	102.83	60.05	102.88	21.8	28.2	J-111
201	J-53	TRUE	230	350	230.05	350.05	59	50.1	J-372
202	J-40	TRUE	230	350	230	350	62.7	50.1	J-372
203	J-107	TRUE	60	109.7	60	109.7	29.2	21.8	J-111
204	J-212	TRUE	230	307.76	230	307.76	21.8	26.1	J-211
205	J-197	TRUE	230	348.39	230	348.39	37.2	21.8	J-567
206	J-159	TRUE	60	164.31	60	164.31	44.3	21.8	J-480
207	J-163	TRUE	60	212.17	60	212.17	36	21.8	J-480
208	J-92	TRUE	60	74.56	60.04	74.6	21.8	27.7	J-87
209	J-90	TRUE	60	67.07	60.08	67.16	21.8	24.6	J-91
210	J-111	TRUE	60	93.72	60.08	93.79	21.8	21.8	J-721
211	J-177	TRUE	60	139.29	60	139.29	23.1	21.8	J-170
212	J-471	TRUE	230	350	230	350	34.8	28.7	J-229
213	J-233	TRUE	60	114.5	60.06	114.56	21.8	25.6	J-346
214	58 (Dum	TRUE	230	350	231.13	351.13	27.1	28.2	J-229
215	J-1	TRUE	230	350	230.3	350.3	45.7	41.5	J-450
216	J-174	TRUE	60	156.74	60.06	156.8	22	21.8	J-170
218	J-131	TRUE	60	126	60.06	126.06	34.2	21.8	J-346
219	J-100	TRUE	60	109.85	60.09	109.94	23.7	21.8	J-111
220	J-75	TRUE	60	199.29	60	199.29	33.1	21.8	J-372
221	J-60	TRUE	230	350	230	350	61.6	50.1	J-372
222	J-217	TRUE	230	350	230	350	60.6	50.1	J-372
223	J-146	TRUE	60	133.04	60	133.04	31.4	21.8	J-346
224	J-6	TRUE	230	349.17	230.01	349.18	21.8	41.9	J-7
225	J-169	TRUE	230	288.43	230	288.43	24.3	21.8	J-388
226	J-4	TRUE	230	350	230	350	45.9	43.7	J-697
227	J-27	TRUE	230	350	230.04	350.04	54.1	47.6	J-697
228	J-158	TRUE	60	145.48	60	145.48	35	21.8	J-480
229	J-14	TRUE	230	350	230	350	52.4	46.5	J-697
230	J-105	TRUE	60	109.7	60.08	109.78	21.8	26.8	J-346
231	J-261	TRUE	230	350	230	350	37.4	23.9	J-567
232	J-51	TRUE	230	350	230.11	350.11	63.1	49.8	J-697
233	J-183	TRUE	230	312.37	230	312.37	46.5	21.8	J-567
234	J-106	TRUE	60	109.97	60.04	110.01	30.8	21.8	J-111
235	J-244	TRUE	230	350	230	350	63.4	49	J-697
236	J-185	TRUE	230	310.78	230.19	310.97	43	21.8	J-567
237	J-205	TRUE	230	333.97	230	333.97	29.8	21.8	J-567
238	J-88	TRUE	60	70.98	60.08	71.06	21.8	21.8	J-483
239	J-87	TRUE	60	73.37	60	73.37	21.8	22.3	J-88
240	J-104	TRUE	60	121.43	60.08	121.5	25.8	21.8	J-346
241	J-246	TRUE	230	350	230	350	59.2	50.1	J-372
242	J-232	TRUE	60	111.12	60	111.12	25.4	21.8	J-346

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
243	J-30	TRUE	230	350	230.03	350.03	55.9	48.2	J-697
244	J-9	TRUE	230	350	230.02	350.02	54.2	44.7	J-697
245	J-182	TRUE	230	304.75	230.06	304.82	43.2	21.8	J-567
246	J-203	TRUE	230	329.89	230.12	330.01	35.9	21.8	J-567
247	J-65	TRUE	230	350	230	350	56.8	50.1	J-372
248	J-113	TRUE	60	116.18	60	116.18	27.5	21.8	J-111
249	J-126	TRUE	60	116.93	60.08	117.01	25.6	21.8	J-346
251	J-175	TRUE	60	142.79	60.03	142.82	22.4	21.8	J-170
252	J-108	TRUE	60	109.25	60.02	109.28	28.3	21.8	J-111
253	J-152	TRUE	60	104.21	60.07	104.28	32.6	21.8	J-480
254	J-200	TRUE	230	340.02	230	340.02	38.9	21.8	J-567
255	J-36	TRUE	230	350	230	350	60.7	49.5	J-697
256	J-143	TRUE	60	90.18	60	90.18	21.8	22	J-144
257	J-81	TRUE	60	93.36	60	93.36	41.6	21.8	J-372
258	J-12	TRUE	230	350	230	350	48.2	46.1	J-697
259	J-226	TRUE	230	304.32	230.03	304.36	23.3	21.8	J-228
260	J-45	TRUE	230	350	230.03	350.03	55.5	48.5	J-697
261	J-17	TRUE	230	350	230	350	52.6	46	J-697
262	J-206	TRUE	230	335.95	230	335.95	26.9	21.8	J-317
263	J-115	TRUE	60	112.03	60.03	112.06	28	21.8	J-111
264	J-150	TRUE	60	107.4	60	107.4	31.5	21.8	J-480
265	J-77	TRUE	60	161.04	60	161.04	49.1	21.8	J-372
266	J-18	TRUE	230	350	230	350	57.9	45.8	J-697
267	J-141	TRUE	60	95.68	60	95.68	22	21.8	J-143
268	J-8	TRUE	230	350	230.06	350.06	58.8	45.6	J-697
270	J-118	TRUE	60	106.71	60.09	106.8	21.8	23.8	J-111
271	J-34	TRUE	230	350	230	350	57.6	49	J-697
272	J-263	TRUE	230	350	230	350	36.7	25.7	J-567
273	J-135	TRUE	60	115.04	60.1	115.15	30.5	21.8	J-346
274	J-121	TRUE	60	121.26	60.02	121.29	23.1	21.8	J-346
275	J-181	TRUE	230	300.76	230.01	300.77	41.5	21.8	J-567
276	J-264	TRUE	230	350	231.01	351.01	32.7	23.7	J-567
277	J-220	TRUE	230	314.54	230.13	314.67	33	21.8	J-567
278	J-252	TRUE	60	72.63	60.02	72.66	27.4	21.8	J-371
279	J-142	TRUE	60	86.92	60	86.92	21.8	31.1	J-143
280	J-109	TRUE	60	108.32	60.04	108.36	29.3	21.8	J-111
281	J-129	TRUE	60	124.5	60.09	124.59	23.1	21.8	J-346
282	J-39	TRUE	230	350	230	350	58	49.8	J-697
283	J-164	TRUE	60	227.26	60	227.26	34.9	21.8	J-480
285	J-219	TRUE	230	314	230.04	314.04	37.5	21.8	J-567
286	J-469	TRUE	230	350	230	350	29.2	28.3	J-229
287	J-256	TRUE	60	66.64	60.05	66.69	21.8	21.8	J-499
288	J-120	TRUE	60	119.05	60	119.05	22.9	21.8	J-111
289	J-230	TRUE	230	344.16	230	344.16	23.7	21.8	J-229
290	J-130	TRUE	60	124.96	60.04	125	30.4	21.8	J-346
291	J-117	TRUE	60	108.14	60.06	108.2	21.8	22.4	J-118
292	J-223	TRUE	230	311.25	230.01	311.25	26.1	21.8	J-317
293	J-218	TRUE	230	350	230	350	59.9	50.1	J-372
294	J-46	TRUE	230	350	230	350	53.9	48.2	J-697
295	J-2	TRUE	230	350	230.18	350.18	44.6	43.1	J-697
296	J-26	TRUE	230	350	230.01	350.01	56.4	47.4	J-697
297	J-189	TRUE	60	245.66	60.06	245.73	41.7	21.8	J-372
298	J-211	TRUE	230	320.48	230	320.48	21.8	21.9	J-212
299	J-23	TRUE	230	350	230.02	350.02	53.7	47.3	J-697
301	J-59	TRUE	230	350	231.01	351.01	60.1	50.1	J-372
302	J-156	TRUE	60	105.85	60	105.85	31.2	21.8	J-480
303	J-199	TRUE	230	341.18	230.01	341.19	21.8	23.5	J-567

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305	J-148	TRUE	60	118.22	60.01	118.23	29.7	21.8	J-480
306	J-132	TRUE	60	124.58	60.04	124.61	27.5	21.8	J-346
307	J-19	TRUE	230	350	230	350	56.3	46.3	J-697
308	J-83	TRUE	60	93.36	60	93.36	24.3	21.8	J-372
309	J-139	TRUE	60	91.54	60.06	91.6	21.8	34	J-346
310	J-133	TRUE	60	123.56	60.04	123.59	25.6	21.8	J-346
311	J-96	TRUE	60	118.91	60.05	118.96	32.4	21.8	J-111
312	J-204	TRUE	230	330.52	230	330.52	35	21.8	J-567
313	J-52	TRUE	230	350	230	350	61	50.1	J-697
314	J-55	TRUE	230	350	230.05	350.05	60	50.1	J-372
315	J-74	TRUE	60	178.95	60	178.95	36.1	21.8	J-491
316	J-253	TRUE	60	71.03	60.01	71.04	27.4	21.8	J-371
317	J-225	TRUE	230	279.85	230	279.85	24.4	21.8	J-317
318	J-186	TRUE	230	309.21	230	309.21	47.7	21.8	J-567
319	J-66	TRUE	230	350	230	350	62.2	50.1	J-372
320	J-227	TRUE	230	287.53	230	287.54	22.8	21.8	J-228
321	J-54	TRUE	230	350	230.01	350.01	58.1	50.1	J-372
322	J-470	TRUE	230	350	230	350	31.6	28.6	J-229
323	J-165	TRUE	60	246.33	60	246.33	32.6	21.8	J-480
324	J-32	TRUE	230	350	230.05	350.05	59.4	48.7	J-697
325	J-42	TRUE	230	350	230.03	350.03	58.4	49.3	J-697
326	J-178	TRUE	230	293.74	230.11	293.85	32.3	21.8	J-567
327	J-93	TRUE	60	121.34	60.09	121.43	22.2	21.8	J-111
328	J-97	TRUE	60	116.09	60.05	116.14	36.3	21.8	J-111
329	J-122	TRUE	60	121.21	60.03	121.24	26.3	21.8	J-346
330	J-84	TRUE	60	89.21	60.01	89.22	24.1	21.8	J-87
331	J-62	TRUE	230	350	230	350	52.7	50.1	J-372
332	J-29	TRUE	230	350	230.01	350.01	54.2	48	J-697
333	J-94	TRUE	60	121.29	60	121.29	30.2	21.8	J-111
334	J-72	TRUE	60	112.74	60.05	112.79	21.8	28.8	J-693
335	J-188	TRUE	230	307.16	230	307.16	46.6	21.8	J-567
336	J-231	TRUE	60	187.82	60	187.82	26.2	21.8	J-491
337	J-229	TRUE	230	297.59	230.25	297.84	21.8	34.1	J-230
338	J-466	TRUE	230	350	230	350	28.9	27.9	J-229
339	J-10	TRUE	230	350	230.09	350.09	46	45.5	J-697
340	J-95	TRUE	60	120.19	60.02	120.21	31.1	21.8	J-111
341	5 (Dum	TRUE	230	350	231.13	351.13	52.3	47.3	J-697
342	J-78	TRUE	60	153.19	60	153.19	50.5	21.8	J-372
343	J-99	TRUE	60	110.77	60.11	110.88	32.5	21.8	J-111
345	J-7	TRUE	230	350	230	350	41.7	41.3	J-6
346	J-196	TRUE	230	349.94	230.08	350.02	37.8	21.8	J-567
347	J-208	TRUE	230	350	230.01	350.01	25.1	27.4	J-229
348	J-68	TRUE	60	91.66	60.06	91.72	33.3	21.8	J-491
349	J-73	TRUE	60	170.94	60.1	171.04	38.4	21.8	J-491
350	J-79	TRUE	60	125.96	60	125.96	49.7	21.8	J-372
351	J-464	TRUE	230	350	230	350	29.7	27.6	J-229
352	J-221	TRUE	230	314.54	230	314.55	29	21.8	J-317
353	J-63	TRUE	230	350	230.06	350.06	52.3	50.1	J-372
354	J-48	TRUE	230	350	230	350	54.9	48.6	J-697
355	J-173	TRUE	60	172.28	60.1	172.38	23	21.8	J-170
356	J-136	TRUE	60	116.07	60	116.07	26.5	21.8	J-346
357	J-255	TRUE	60	73.68	60.04	73.72	40.4	21.8	J-491
358	J-137	TRUE	60	121.52	60.07	121.59	23.7	21.8	J-346
359	J-44	TRUE	230	350	230	350	58.5	48.8	J-697
363	J-69	TRUE	60	107.52	60.07	107.59	36.9	21.8	J-491
364	J-461	TRUE	230	319.71	230.04	319.75	21.8	26.6	J-542
365	J-50	TRUE	230	350	230	350	54.2	48.5	J-697

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366	J-58	TRUE	230	350	230.01	350.01	61.7	50.1	J-372
367	J-61	TRUE	230	350	230.01	350.01	54.5	50.1	J-372
368	6 (Dum	TRUE	230	350	231.13	351.13	58.5	50.1	J-372
369	J-47	TRUE	230	350	230.01	350.01	54.3	47.8	J-697
370	J-176	TRUE	60	139.79	60.21	140	21.8	23.3	J-170
371	J-128	TRUE	60	108.97	60.06	109.03	22.9	21.8	J-138
372	J-151	TRUE	60	106.37	60.03	106.4	32.8	21.8	J-480
373	J-13	TRUE	230	350	230.01	350.01	53	46.3	J-697
374	J-33	TRUE	230	350	230.01	350.01	58.3	48.8	J-697
376	J-123	TRUE	60	120.97	60.01	120.98	27.7	21.8	J-346
378	J-21	TRUE	230	350	230.06	350.06	53.2	46.7	J-697
379	0 (Dum	TRUE	230	295.05	231.13	296.18	39.5	21.8	J-567
380	J-202	TRUE	230	320.44	230	320.44	45	21.8	J-567
381	J-168	TRUE	230	293.32	230	293.32	30.9	21.8	J-567
382	J-49	TRUE	230	350	230.06	350.06	53.1	48.6	J-697
383	J-110	TRUE	60	100.39	60.07	100.47	24.8	21.8	J-111
384	J-102	TRUE	60	108.42	60.04	108.47	23.4	21.8	J-103
385	J-31	TRUE	230	350	230	350	59.2	48.5	J-697
386	J-147	TRUE	60	133.89	60	133.89	31.8	21.8	J-480
387	J-28	TRUE	230	350	230	350	53.7	47.8	J-697
388	J-24	TRUE	230	350	230.01	350.01	51.2	47.2	J-697
389	J-465	TRUE	230	350	230	350	27.4	27.7	J-229
390	J-154	TRUE	60	90.23	60.05	90.28	30.5	21.8	J-480
391	J-89	TRUE	60	70.04	60.03	70.06	21.8	22.9	J-90
392	J-153	TRUE	60	94.7	60.04	94.74	31.8	21.8	J-480
394	J-98	TRUE	60	112.38	60.05	112.43	34.7	21.8	J-111
395	J-259	TRUE	230	350	230.19	350.19	45.5	46	J-461
396	J-3	TRUE	230	350	230.15	350.15	44.5	43.5	J-697
397	J-85	TRUE	60	85.8	60	85.8	24.2	21.8	J-87
398	J-71	TRUE	60	128.73	60.05	128.77	24.8	21.8	J-491
399	J-116	TRUE	60	108.1	60.05	108.15	21.8	22.8	J-111
400	J-167	TRUE	230	294.08	230	294.08	31.7	21.8	J-567
401	J-70	TRUE	60	128.73	60.05	128.77	40.4	21.8	J-491
402	J-43	TRUE	230	350	230	350	58.1	49	J-697
403	J-179	TRUE	230	294.18	230	294.18	35.8	21.8	J-567
406	J-224	TRUE	230	307.13	230.13	307.26	27.4	21.8	J-317
407	J-35	TRUE	230	350	230	350	63.8	49.3	J-697
408	J-145	TRUE	60	126.22	60	126.22	34.8	21.8	J-346
409	J-170	TRUE	60	118.47	60	118.47	21.8	31	J-177
410	J-228	TRUE	230	277.53	230.09	277.62	21.8	24.4	J-567
411	J-15	TRUE	230	350	230.1	350.1	52.5	46.9	J-697
412	eson Zo	TRUE	230	350	230.13	350.13	53.5	50.1	J-372
413	J-262	TRUE	230	350	230	350	37.9	28.5	J-567
414	J-76	TRUE	60	181.27	60	181.27	49.6	21.8	J-372
415	J-82	TRUE	60	93.36	60	93.36	31.7	21.8	J-372
416	J-187	TRUE	230	308.15	230.03	308.19	47.1	21.8	J-567
417	J-124	TRUE	60	120.63	60	120.63	29.8	21.8	J-346
418	J-86	TRUE	60	79.56	60.04	79.6	23.6	21.8	J-87
419	J-101	TRUE	60	109.37	60.07	109.44	21.8	21.9	J-111
420	J-140	TRUE	60	101.39	60.03	101.43	21.8	31.1	J-346
422	J-198	TRUE	230	348.39	230.36	348.75	25.4	21.8	J-567
423	J-248	TRUE	230	324.99	230	324.99	21.8	22.8	J-211
424	J-247	TRUE	230	344.18	230	344.18	22.1	21.8	J-248
426	J-5	TRUE	230	350	230	350	46.8	44.1	J-697
427	J-171	TRUE	60	195.28	60.06	195.34	23.5	21.8	J-170
428	J-22	TRUE	230	350	230.02	350.02	55.3	47.3	J-697
429	J-16	TRUE	230	350	230	350	53.3	47	J-697

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430	J-184	TRUE	230	311.41	230.05	311.47	44	21.8	J-567
431	J-57	TRUE	230	350	230	350	58.5	50.1	J-372
432	J-11	TRUE	230	350	230.12	350.12	44	45.8	J-697
433	J-467	TRUE	230	350	230.2	350.2	29.2	28.1	J-229
434	J-127	TRUE	60	108.95	60.05	108.99	21.8	26.7	J-346
435	J-20	TRUE	230	350	230.01	350.01	52.5	46.5	J-697
436	J-172	TRUE	60	184.63	60.06	184.68	21.8	21.9	J-170
437	J-157	TRUE	60	142.8	60.03	142.82	33.5	21.8	J-480
438	J-161	TRUE	60	186.45	60	186.45	40	21.8	J-480
439	J-114	TRUE	60	116.18	60.01	116.18	25.6	21.8	J-111
440	J-149	TRUE	60	108.52	60.03	108.54	31.6	21.8	J-480
441	akesho	TRUE	60	116.18	60.08	116.27	31.3	21.8	J-111
442	J-257	TRUE	60	71.73	60.01	71.74	21.8	21.8	J-499
443	J-155	TRUE	60	84.36	60.04	84.4	29.1	21.8	J-480
444	0 (Dum	TRUE	60	98.94	61.13	100.07	42.7	21.8	J-372
445	J-125	TRUE	60	201.58	60.07	201.64	21.8	21.8	J-209
446	J-193	TRUE	60	243.48	60.05	243.53	31	21.8	J-372
447	J-194	TRUE	60	142.01	60.05	142.06	21.8	41.8	J-372
448	J-209	TRUE	60	143.24	60.06	143.29	21.8	38.9	J-372
449	J-214	TRUE	60	159.46	60	159.46	21.8	36.5	J-372
450	J-215	TRUE	60	238.24	60	238.24	21.8	24.9	J-372
451	J-216	TRUE	230	278.92	230	278.92	21.8	50.1	J-372
452	J-274	TRUE	60	243.71	60	243.71	32.2	21.8	J-372
453	J-275	TRUE	230	276.83	230.01	276.84	22.5	21.8	J-567
454	J-276	TRUE	230	305.27	230.02	305.29	47.1	21.8	J-567
455	J-277	TRUE	230	302.48	230.01	302.49	44.4	21.8	J-567
456	J-278	TRUE	230	350	230	350	53.6	50.1	J-372
457	9 (Dum	TRUE	230	350	231.13	351.13	47.8	50.1	J-372
458	J-280	TRUE	230	350	230.34	350.34	42.6	50.1	J-372
460	J-317	TRUE	230	248.81	230	248.81	21.8	32	J-225
461	reme S	TRUE	230	350	230	350	40.1	41.1	J-450
462	J-369	TRUE	230	350	230.04	350.04	47.4	43.8	J-697
463	J-413	TRUE	60	107.95	60	107.95	21.8	22.1	J-111
464	J-414	TRUE	230	350	230.01	350.01	35	27.3	J-567
465	J-415	TRUE	230	350	230	350	53.8	45	J-697
466	J-416	TRUE	230	350	230	350	37	27.9	J-567
467	J-417	TRUE	230	350	230	350	66.4	48.1	J-697
468	J-418	TRUE	230	350	230	350	66.2	47.9	J-697
469	J-426	TRUE	230	265.08	230	265.08	21.8	50.1	J-372
470	J-427	TRUE	230	288.83	230.16	288.99	21.8	50.1	J-372
472	J-433	TRUE	230	350	230.02	350.02	53.1	50.1	J-372
473	J-455	TRUE	60	102.8	60.01	102.82	21.8	25.7	J-346
474	J-456	TRUE	60	121.6	60	121.6	25.8	21.8	J-346
475	J-457	TRUE	60	121.51	60.03	121.54	25.6	21.8	J-346
476	J-458	TRUE	60	113	60.01	113.01	24	21.8	J-459
477	J-459	TRUE	60	106.45	60	106.45	21.8	28.1	J-346
478	J-460	TRUE	60	112.54	60.02	112.56	21.8	25.6	J-346
479	J-462	TRUE	60	121.47	60.01	121.49	25.5	21.8	J-346
480	J-473	TRUE	60	121.45	60	121.45	25.6	21.8	J-346
481	J-474	TRUE	230	350	230	350	23.4	25.7	J-567
482	J-475	TRUE	60	82.67	60	82.67	29.9	21.8	J-480
483	J-476	TRUE	60	80.36	60	80.36	30.5	21.8	J-480
484	J-477	TRUE	60	71.62	60.06	71.68	27.2	21.8	J-480
485	J-478	TRUE	60	66.29	60	66.29	21.8	21.8	J-480
486	J-479	TRUE	60	61.06	60	61.06	21.8	21.8	J-480
487	J-480	FALSE	60	57.57	60.03	57.6	21.8	24.8	J-479
488	ntry Sq	TRUE	60	65.4	60.01	65.4	22.6	21.8	J-482

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489	J-482	TRUE	60	63.54	60	63.54	21.8	24	J-480
490	J-483	TRUE	60	68.74	60	68.74	21.8	24.8	J-88
491	J-484	TRUE	60	73.13	60	73.13	40.3	21.8	J-491
492	J-485	TRUE	60	72.79	60.02	72.81	40.3	21.8	J-491
493	reenbri	TRUE	60	72.46	60.06	72.52	39.9	21.8	J-491
494	J-487	TRUE	60	72.03	60.02	72.05	35.1	21.8	J-491
495	J-488	TRUE	60	71.7	60	71.7	33.2	21.8	J-491
496	J-489	TRUE	60	71.28	60.01	71.29	29.2	21.8	J-491
497	J-490	TRUE	60	71.01	60	71.01	26.2	21.8	J-491
498	J-491	TRUE	60	70.71	60	70.71	21.8	24.5	J-353
499	J-492	TRUE	230	342.2	230.03	342.23	21.8	23.5	J-685
500	J-493	TRUE	230	287.35	230	287.35	21.8	24.3	J-496
501	J-494	TRUE	230	256.77	230	256.77	23.8	21.8	J-496
502	J-496	TRUE	230	238.96	230	238.96	21.8	23.7	J-701
503	J-497	FALSE	230	219.42	230.29	219.71	22.4	21.8	J-579
504	J-498	FALSE	230	204.65	230	204.65	21.8	23	J-579
505	J-499	TRUE	60	63.5	60.05	63.55	21.8	27	J-256
506	J-500	TRUE	60	223.25	60.04	223.29	21.8	28.6	J-372
507	anattor	TRUE	230	350	230	350	33.5	34.7	J-569
508	J-502	TRUE	60	172.16	60.03	172.19	22.7	21.8	J-505
509	J-503	TRUE	60	147.41	60.04	147.45	22.1	21.8	J-505
510	J-504	TRUE	60	127.48	60.05	127.53	22.9	21.8	J-505
511	J-505	TRUE	60	115.19	60.07	115.26	21.8	33.1	J-504
512	J-506	TRUE	60	183.08	60.04	183.12	21.8	21.8	J-507
513	J-507	TRUE	60	144.31	60.05	144.36	21.8	34.4	J-372
514	J-508	TRUE	230	350	230	350	48.4	38.9	J-697
515	J-510	TRUE	60	76.21	60	76.21	37.4	21.8	J-372
516	J-511	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
518	J-338	TRUE	60	102.06	60	102.06	27.5	21.8	J-346
519	J-339	TRUE	60	107.92	60.07	107.99	26	21.8	J-346
520	J-340	TRUE	60	101.59	60.16	101.75	24.3	21.8	J-346
521	J-341	TRUE	60	96.88	60	96.88	21.8	24.2	J-346
522	J-342	TRUE	60	97.87	60	97.87	29.5	21.8	J-346
523	J-343	TRUE	60	84.3	60.1	84.41	26.9	21.8	J-346
524	J-344	TRUE	60	76.25	60	76.25	24.9	21.8	J-346
525	J-345	TRUE	60	71.13	60.07	71.21	23.3	21.8	J-346
526	J-346	TRUE	60	66.83	60	66.83	21.8	26.6	J-345
527	J-347	TRUE	60	73.48	60	73.48	38.1	21.8	J-491
528	J-348	TRUE	60	72.92	60.14	73.07	28.5	21.8	J-491
529	J-349	TRUE	60	71.97	60.05	72.02	27.4	21.8	J-491
530	J-350	TRUE	60	71.79	60	71.79	21.8	21.8	J-491
531	J-351	TRUE	60	71.52	60	71.52	22.7	21.8	J-491
532	J-352	TRUE	60	71.26	60	71.26	26	21.8	J-491
533	J-353	TRUE	60	71.03	60	71.03	22.9	21.8	J-491
549	J-371	TRUE	60	63.51	60	63.51	21.8	28	J-682
550	J-372	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
551	J-373	TRUE	60	145.52	60	145.52	21.8	23.5	J-176
552	J-374	TRUE	60	160.12	60	160.12	21.8	23.4	J-373
553	J-375	TRUE	60	186.57	60	186.57	21.8	23.4	J-374
565	J-388	TRUE	230	260.57	230	260.57	21.8	28.1	J-567
567	J-390	TRUE	230	350	230.14	350.14	56.9	46.4	J-697
568	1 (Dun	TRUE	230	350	231.13	351.13	45.4	41.5	J-697
569	J-392	TRUE	230	350	230.02	350.02	31.1	29	J-697
570	J-393	TRUE	230	350	237.49	357.49	37.3	32	J-650
593	J-424	TRUE	230	350	230.04	350.04	54.5	42.6	J-697
594	J-425	TRUE	230	350	230	350	40.6	36.9	J-697
602	J-437	TRUE	60	105.36	60	105.36	25.2	21.8	J-346

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
614	J-449	TRUE	230	350	230.35	350.35	24.1	27.1	J-208
615	J-450	TRUE	230	350	230	350	39.5	41.3	Supreme Steel
616	J-451	TRUE	230	299.63	230.13	299.76	37.6	21.8	J-567
617	J-452	TRUE	60	83.48	60.12	83.6	21.8	22.3	J-346
618	J-453	TRUE	60	105.32	60.1	105.42	22.3	21.8	J-346
619	J-454	TRUE	230	337.06	230.14	337.2	21.8	27.8	J-668
621	J-481	TRUE	230	350	230.19	350.19	45.6	38.6	J-607
623	J-495	TRUE	230	350	230	350	65.3	47.3	J-697
624	J-514	TRUE	230	350	230.07	350.07	49.8	47.1	J-697
1202	J-515	TRUE	230	272.16	230.07	272.24	21.8	32.3	J-695
1205	J-516	TRUE	230	350	230	350	37.6	33	J-650
1210	J-518	TRUE	230	350	230	350	34.1	42.6	J-697
1212	J-519	TRUE	230	350	230	350	51.2	46.4	J-697
1215	J-520	TRUE	60	124.45	60	124.45	21.8	29.9	J-373
1217	J-521	TRUE	60	72.39	60	72.39	26	21.8	J-491
1221	J-523	TRUE	60	70.04	60	70.04	21.8	24.3	J-491
1223	J-524	TRUE	60	71.97	60	71.97	27	21.8	J-491
1225	J-525	TRUE	60	68.86	60	68.86	21.8	24.7	J-491
1247	J-529	TRUE	230	350	230	350	48.7	46.9	J-530
1250	J-530	TRUE	230	350	230	350	36.9	45.1	J-531
1252	J-531	TRUE	230	350	230	350	34.4	44.1	J-532
1254	J-532	TRUE	230	350	230	350	38.7	43.3	J-531
1261	J-535	TRUE	230	350	230	350	35.7	38.5	Panattoni
1279	J-542	TRUE	230	304.63	230	304.63	21.8	27.4	J-461
1303	J-550	TRUE	230	350	230	350	34	33.6	J-668
1308	J-552	TRUE	60	93.36	60.01	93.37	27.9	21.8	J-372
1310	J-553	TRUE	60	70.53	60	70.53	21.8	22.2	J-346
1313	J-554	TRUE	230	343.71	230	343.71	37.3	21.8	J-567
1317	J-555	TRUE	230	350	230	350	35.8	23.4	J-567
1320	J-556	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1322	J-557	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1323	J-558	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1330	J-560	TRUE	230	257.8	230.2	257.99	21.8	25.6	J-709
1333	J-561	TRUE	230	350	230	350	57.2	50.1	J-372
1336	J-562	TRUE	230	300.61	230.02	300.64	42.9	21.8	J-567
1339	J-563	TRUE	230	297.77	230.44	298.21	32	21.8	J-567
1342	J-564	TRUE	230	295.57	230	295.57	29.9	21.8	J-567
1345	J-565	TRUE	230	280.1	230	280.1	30	21.8	J-567
1348	J-566	TRUE	230	261.96	230.01	261.97	22.4	21.8	J-567
1351	J-567	TRUE	230	239.61	230.02	239.63	21.8	28.3	J-566
1353	J-568	TRUE	230	350	230	350	28.2	28.6	J-567
1356	J-569	TRUE	230	350	230	350	31.8	34.3	J-578
1359	J-570	TRUE	230	350	230	350	28.1	29.7	J-571
1362	J-571	TRUE	230	350	230	350	26.7	28.3	J-578
1366	J-573	TRUE	230	350	230.08	350.08	40.8	41.5	J-698
1369	J-574	TRUE	230	350	230	350	42.7	40.7	J-607
1372	J-575	TRUE	230	350	230	350	44.1	42.9	J-697
1375	J-576	TRUE	230	350	230.74	350.74	49.2	42.1	J-697
1387	J-578	TRUE	230	350	230	350	26.3	28.9	J-571
1390	J-579	FALSE	230	206.64	230	206.64	21.8	22.4	J-498
1405	J-586	TRUE	230	350	230.04	350.04	46.9	41.9	J-697
1452	J-602	TRUE	60	73.45	60	73.45	33.3	21.8	J-491
1473	J-607	TRUE	230	293.08	230	293.08	21.8	48.9	J-697
1475	J-608	TRUE	230	350	230	350	43.7	40.4	J-697
1478	J-609	TRUE	230	350	230	350	33	40.4	J-697
1480	J-610	TRUE	230	350	230.32	350.32	45	40.8	J-697
1483	J-611	TRUE	230	350	230	350	53.9	44.7	J-697

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
1499	J-613	TRUE	230	247.99	230	247.99	21.8	25	J-709
1504	J-614	TRUE	230	274.97	230	274.97	28.5	21.8	J-567
1556	J-628	TRUE	230	350	230	350	37.5	31.2	J-697
1559	J-629	TRUE	230	350	230	350	57.9	34.5	J-697
1619	J-634	TRUE	230	350	230	350	34.7	29.7	J-697
1681	J-642	TRUE	230	350	230	350	37.4	32.4	J-650
1741	J-647	TRUE	230	350	230	350	30.2	29.5	J-650
1744	8 (Dum	TRUE	230	337.74	231.13	338.87	21.8	25.6	J-649
1746	J-649	TRUE	230	338.72	230	338.72	21.8	25.3	J-648 (Dummy)
1748	J-650	TRUE	230	350	230	350	28.7	30.6	J-697
1857	J-662	TRUE	60	88.57	60	88.57	21.8	24.3	J-372
1859	J-663	TRUE	60	83.25	60	83.25	21.8	24.6	J-87
1930	J-668	TRUE	230	350	230	350	23	24.1	J-454
1949	J-675	TRUE	230	350	230	350	44	39.8	J-607
1952	J-676	TRUE	230	350	230	350	44.8	40.3	J-607
1965	J-682	TRUE	60	66.64	60	66.64	23.8	21.8	J-371
1974	J-685	TRUE	230	311.45	230	311.45	21.8	23.7	J-493
1980	J-687	TRUE	230	350	230	350	43.3	41.5	J-697
1983	J-688	TRUE	230	350	230	350	48.5	45.7	J-697
1986	J-689	TRUE	230	350	230	350	46.3	41.8	J-697
1989	J-690	TRUE	60	84.28	60	84.28	40.5	21.8	J-372
1995	J-692	TRUE	60	68.74	60	68.74	21.8	21.8	J-499
1998	J-693	TRUE	60	120.35	60	120.35	21.8	21.8	J-72
2001	J-694	TRUE	230	243.26	230	243.26	21.8	37.7	J-695
2004	J-695	TRUE	230	242.24	230	242.24	21.8	37.3	J-694
2009	J-697	TRUE	230	350	230	350	27.7	32.7	J-650
2012	J-698	TRUE	230	350	230	350	41.1	41.4	J-573
2015	J-699	TRUE	230	350	230	350	54	44.1	J-697
2024	J-701	FALSE	230	229.91	230	229.91	21.8	22.9	J-579
2048	J-709	TRUE	230	255.95	230	255.95	21.8	22.2	J-613
2142	J-719	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2145	J-720	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2148	J-721	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2153	J-723	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2155	J-724	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2157	J-725	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
185	J-160	584,027.01	5,934,838.88	678.02	0	75.30	731.03
186	J-222	582,145.56	5,932,813.74	700.26	0	63.30	744.85
187	J-162	583,810.38	5,934,670.57	685.00	0	65.40	731.05
188	J-138	584,613.67	5,935,181.42	678.38	0	74.60	730.95
189	J-192	581,191.96	5,933,912.97	677.56	0	95.50	744.85
190	J-119	584,936.53	5,935,869.14	667.10	0	70.80	716.99
191	J-134	584,764.89	5,935,072.26	680.51	0.1	71.60	730.97
192	J-67	581,650.04	5,931,561.40	710.00	0.01	73.50	761.81
193	J-38	581,243.76	5,931,279.09	710.00	0.02	73.20	761.57
194	J-41	581,141.03	5,931,480.63	710.00	0.05	73.20	761.57
195	J-144	584,396.66	5,935,219.39	675.00	0	79.40	730.95
196	J-37	581,243.76	5,931,168.95	710.00	0.01	73.20	761.56
197	J-472	580,740.47	5,933,183.14	689.91	0	78.00	744.89
198	J-201	581,815.00	5,933,229.15	690.13	0	77.70	744.85
199	J-91	582,694.12	5,935,128.13	658.00	0	82.60	716.18
200	J-103	585,091.20	5,936,277.99	665.00	0.12	73.80	716.99
201	J-53	581,438.28	5,930,980.15	710.00	0.12	73.20	761.60
202	J-40	581,233.98	5,931,482.32	710.00	0.01	73.20	761.59
203	J-107	584,778.23	5,935,996.97	664.16	0	75.00	716.99
204	J-212	581,825.45	5,932,053.99	710.00	0	73.80	761.97
205	J-197	581,603.91	5,933,472.82	685.44	0	84.30	744.85
206	J-159	584,150.38	5,934,848.85	679.15	0	73.60	731.03
207	J-163	583,696.80	5,934,580.94	685.00	0	65.40	731.06
208	J-92	582,355.13	5,935,027.71	660.00	0.09	79.70	716.18
209	J-90	582,616.55	5,935,084.61	660.00	0.19	79.70	716.18
210	J-111	585,098.38	5,935,794.30	672.05	0.17	63.80	716.99
211	J-177	583,865.02	5,934,178.46	693.29	0	53.60	731.06
212	J-471	580,745.35	5,933,130.74	690.00	0	77.90	744.89
213	J-233	584,681.75	5,934,979.21	681.75	0.14	69.90	730.97
214	68 (Dum	580,952.95	5,932,747.92	698.59	2.54	65.70	744.90
215	J-1	579,511.27	5,931,168.86	705.00	0.68	80.20	761.47
216	J-174	583,865.88	5,934,330.48	690.60	0.13	57.40	731.06
218	J-131	584,433.28	5,934,995.60	679.54	0.14	73.00	730.97
219	J-100	584,835.40	5,936,162.83	665.00	0.2	73.80	716.99
220	J-75	581,067.83	5,934,963.64	655.66	0	85.90	716.18
221	J-60	581,268.02	5,931,483.28	710.00	0	73.20	761.60
222	J-217	581,836.74	5,931,627.98	710.00	0	73.90	762.03
223	J-146	584,443.42	5,934,865.47	686.39	0	63.30	730.99
224	J-6	579,945.01	5,931,013.88	708.42	0.03	75.30	761.49
225	J-169	583,532.49	5,933,358.14	700.00	0	63.60	744.82
226	J-4	579,847.42	5,931,278.15	705.69	0	79.20	761.48
227	J-27	580,669.54	5,930,951.45	710.00	0.09	73.10	761.51
228	J-158	584,415.79	5,934,856.33	685.70	0	64.30	731.01
229	J-14	580,335.90	5,931,383.96	710.00	0	73.10	761.48
230	J-105	584,480.67	5,935,747.97	663.83	0.18	75.50	716.99
231	J-261	581,205.35	5,933,531.77	685.10	0	84.80	744.85
232	J-51	581,311.65	5,930,974.43	710.00	0.24	73.20	761.56

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
233	J-183	582,114.01	5,933,238.15	690.57	0	77.00	744.84
234	J-106	584,742.82	5,936,007.34	663.04	0.1	76.60	716.99
235	J-244	581,247.28	5,930,944.87	712.82	0	69.10	761.53
236	J-185	582,109.89	5,933,372.58	689.49	0.43	78.60	744.84
237	J-205	581,855.89	5,932,883.46	697.62	0	67.10	744.87
238	J-88	582,477.45	5,934,962.82	661.52	0.17	77.60	716.18
239	J-87	582,416.94	5,934,900.96	661.92	0	77.00	716.18
240	J-104	584,294.78	5,935,708.60	663.84	0.18	75.40	717.00
241	J-246	581,897.49	5,931,628.85	710.00	0	74.00	762.15
242	J-232	584,892.94	5,934,920.80	684.28	0	66.30	730.96
243	J-30	580,902.68	5,930,954.31	710.00	0.07	73.10	761.53
244	J-9	580,323.88	5,930,706.90	710.00	0.05	73.10	761.49
245	J-182	582,375.00	5,933,263.31	692.23	0.14	74.70	744.84
246	J-203	581,820.84	5,933,082.06	694.39	0.27	71.60	744.86
247	J-65	581,778.70	5,931,509.37	710.00	0	73.60	761.87
248	J-113	584,707.09	5,935,813.70	666.13	0	72.20	716.99
249	J-126	584,863.23	5,935,234.31	677.59	0.17	75.80	730.96
251	J-175	583,860.04	5,934,212.11	692.89	0.08	54.20	731.06
252	J-108	584,859.07	5,935,946.29	665.31	0.05	73.40	716.99
253	J-152	584,376.31	5,934,716.20	687.39	0.16	61.90	730.99
254	J-200	581,603.76	5,933,231.65	690.97	0	76.50	744.85
255	J-36	581,245.19	5,931,074.55	710.09	0	73.00	761.55
256	J-143	584,418.36	5,935,234.31	675.12	0	79.30	730.95
257	J-81	581,858.80	5,934,643.74	665.00	0	72.70	716.18
258	J-12	580,220.70	5,931,351.93	710.00	0	73.10	761.48
259	J-226	582,264.78	5,932,630.99	705.95	0.07	55.20	744.85
260	J-45	580,893.42	5,931,477.97	710.00	0.08	73.20	761.54
261	J-17	580,311.95	5,931,197.47	710.00	0	73.10	761.49
262	J-206	581,857.12	5,932,625.05	705.00	0	56.60	744.88
263	J-115	584,825.79	5,935,796.19	666.72	0.06	71.40	716.99
264	J-150	584,403.44	5,934,788.09	687.49	0	61.70	730.99
265	J-77	581,167.95	5,934,784.85	659.73	0	80.10	716.18
266	J-18	580,314.80	5,931,075.86	708.85	0	74.70	761.49
267	J-141	584,418.36	5,935,257.37	675.00	0	79.40	730.95
268	J-8	580,315.10	5,931,044.42	708.00	0.13	75.90	761.49
270	J-118	585,014.92	5,935,991.35	667.08	0.2	70.80	716.99
271	J-34	581,184.46	5,930,958.60	713.60	0	68.00	761.53
272	J-263	580,990.65	5,933,540.47	686.38	0	83.00	744.87
273	J-135	584,890.35	5,935,064.77	680.00	0.23	72.30	730.96
274	J-121	584,820.49	5,935,506.24	675.00	0.05	59.60	717.00
275	J-181	582,540.59	5,933,275.94	693.31	0.03	73.10	744.83
276	J-264	581,189.28	5,933,693.30	681.63	2.27	89.70	744.85
277	J-220	582,117.40	5,932,983.49	695.93	0.29	69.40	744.85
278	J-252	578,937.82	5,934,828.30	660.00	0.05	79.70	716.16
279	J-142	584,423.78	5,935,296.70	675.00	0	79.40	730.95
280	J-109	584,921.74	5,935,884.21	666.76	0.1	71.30	716.99
281	J-129	584,501.09	5,935,261.44	676.15	0.2	77.80	730.95

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
282	J-39	581,239.51	5,931,322.53	710.00	0	73.20	761.57
283	J-164	583,606.03	5,934,540.88	685.74	0	64.30	731.07
285	J-219	582,113.42	5,933,083.07	693.64	0.09	72.70	744.85
286	J-469	580,912.58	5,932,829.94	695.69	0	69.80	744.90
287	J-256	580,441.19	5,935,464.19	655.00	0.1	86.80	716.16
288	J-120	584,734.38	5,935,692.75	670.15	0	66.50	717.00
289	J-230	581,106.83	5,932,460.94	706.93	0	53.90	744.91
290	J-130	584,431.22	5,935,093.29	677.58	0.1	75.80	730.96
291	J-117	585,014.92	5,936,121.64	665.00	0.13	73.80	716.99
292	J-223	582,152.61	5,932,731.90	702.98	0.01	59.40	744.85
293	J-218	581,867.74	5,931,628.35	710.00	0	73.90	762.09
294	J-46	580,798.60	5,931,476.05	710.00	0	73.10	761.53
295	J-2	579,680.28	5,931,170.16	705.50	0.41	79.40	761.47
296	J-26	580,564.63	5,931,456.51	710.00	0.02	73.10	761.51
297	J-189	581,084.12	5,934,453.39	665.00	0.14	72.70	716.19
298	J-211	581,876.01	5,932,068.33	710.09	0	73.60	761.97
299	J-23	580,668.11	5,931,070.17	710.00	0.04	73.10	761.51
301	J-59	581,386.82	5,931,485.18	710.00	2.27	73.30	761.65
302	J-156	584,404.53	5,934,722.07	688.13	0	60.80	730.99
303	J-199	581,769.17	5,933,510.82	685.00	0.02	85.00	744.85
305	J-148	584,454.98	5,934,760.96	689.42	0.02	59.00	730.99
306	J-132	584,558.06	5,935,001.03	680.87	0.09	71.10	730.97
307	J-19	580,403.49	5,931,080.18	707.98	0	76.00	761.49
308	J-83	581,967.59	5,934,879.14	661.00	0	78.30	716.18
309	J-139	584,644.86	5,935,312.98	676.87	0.12	76.80	730.95
310	J-133	584,653.03	5,935,049.18	680.00	0.09	72.30	730.97
311	J-96	584,368.02	5,935,856.50	660.02	0.11	80.90	716.99
312	J-204	581,850.05	5,933,080.11	694.67	0	71.20	744.86
313	J-52	581,362.87	5,930,976.72	710.00	0	73.20	761.57
314	J-55	581,524.10	5,931,157.51	710.00	0.12	73.40	761.69
315	J-74	580,931.94	5,934,929.32	656.10	0	85.30	716.18
316	J-253	578,957.63	5,934,474.88	660.00	0.02	79.70	716.16
317	J-225	582,168.53	5,932,538.56	707.11	0	53.60	744.85
318	J-186	582,113.31	5,933,524.29	685.00	0	84.90	744.84
319	J-66	581,776.04	5,931,621.09	710.00	0	73.70	761.91
320	J-227	582,440.48	5,932,638.63	706.71	0.01	54.10	744.84
321	J-54	581,528.40	5,930,990.16	710.00	0.02	73.30	761.63
322	J-470	580,815.61	5,933,005.16	692.36	0	74.60	744.89
323	J-165	583,521.11	5,934,524.87	687.40	0	62.00	731.07
324	J-32	581,064.31	5,930,954.31	710.00	0.1	73.10	761.53
325	J-42	581,092.22	5,931,480.07	710.00	0.06	73.20	761.56
326	J-178	583,196.31	5,933,356.52	696.11	0.24	69.10	744.82
327	J-93	584,191.17	5,935,768.07	660.00	0.2	80.90	716.99
328	J-97	584,487.83	5,935,930.76	660.00	0.12	80.90	716.99
329	J-122	584,821.83	5,935,460.16	675.00	0.07	59.60	717.00
330	J-84	582,052.57	5,934,877.70	660.32	0.03	79.30	716.18
331	J-62	581,787.29	5,931,163.23	710.00	0	73.50	761.77

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
332	J-29	580,819.72	5,930,954.31	710.00	0.02	73.10	761.52
333	J-94	584,255.00	5,935,803.19	660.00	0	80.90	716.99
334	J-72	580,939.25	5,935,281.52	655.00	0.11	86.80	716.17
335	J-188	582,266.79	5,933,527.86	686.55	0	82.70	744.84
336	J-231	580,791.64	5,934,829.71	658.98	0	81.20	716.18
337	J-229	581,106.36	5,932,407.45	708.32	0.04	51.90	744.91
338	J-466	580,911.13	5,932,595.87	700.92	0	62.40	744.90
339	J-10	579,940.63	5,931,347.65	705.00	0.21	80.20	761.48
340	J-95	584,308.01	5,935,828.08	660.00	0.04	80.90	716.99
341	5 (Dumr	580,618.70	5,931,343.45	710.00	2.54	73.10	761.51
342	J-78	581,169.38	5,934,827.76	658.78	0	81.50	716.18
343	J-99	584,705.73	5,936,073.73	662.40	0.24	77.50	716.99
345	J-7	579,949.27	5,931,039.18	708.18	0	75.70	761.49
346	J-196	581,597.38	5,933,587.35	683.44	0.19	87.20	744.85
347	J-208	581,439.10	5,932,459.61	706.90	0.02	53.90	744.91
348	J-68	580,592.95	5,934,845.60	659.96	0.15	79.80	716.17
349	J-73	580,877.59	5,934,935.04	656.37	0.23	84.90	716.18
350	J-79	581,379.39	5,934,807.01	659.35	0	80.70	716.18
351	J-464	580,909.59	5,932,458.81	705.00	0	56.70	744.91
352	J-221	582,125.37	5,932,889.89	698.69	0	65.50	744.85
353	J-63	581,781.57	5,931,261.93	710.00	0.14	73.50	761.80
354	J-48	580,984.87	5,931,374.92	710.00	0	73.20	761.54
355	J-173	583,884.96	5,934,430.17	688.11	0.23	61.00	731.06
356	J-136	584,891.71	5,935,152.93	679.69	0	72.80	730.96
357	J-255	580,263.72	5,934,844.03	655.00	0.08	86.80	716.16
358	J-137	584,631.30	5,935,458.11	675.00	0.16	59.60	717.00
359	J-44	580,980.30	5,931,477.21	710.00	0	73.20	761.54
363	J-69	580,683.06	5,934,980.81	657.45	0.15	83.30	716.17
364	J-461	580,324.91	5,931,786.10	709.66	0.09	73.50	761.44
365	J-50	580,982.78	5,931,104.50	710.00	0	73.20	761.53
366	J-58	581,515.23	5,931,487.78	710.00	0.03	73.40	761.70
367	J-61	581,675.72	5,931,158.94	710.00	0.03	73.40	761.74
368	6 (Dumr	581,521.24	5,931,231.89	710.00	2.54	73.40	761.69
369	J-47	580,657.25	5,931,474.23	710.00	0.02	73.10	761.52
370	J-176	583,816.43	5,934,177.51	694.01	0.48	52.60	731.06
371	J-128	584,625.87	5,935,253.30	677.60	0.14	75.70	730.95
372	J-151	584,368.17	5,934,786.73	686.46	0.07	63.20	730.99
373	J-13	580,314.34	5,931,355.17	710.00	0.02	73.10	761.48
374	J-33	581,129.33	5,930,960.12	711.70	0.01	70.70	761.53
376	J-123	584,823.26	5,935,405.93	675.00	0.02	59.60	717.00
378	J-21	580,469.94	5,931,023.06	709.21	0.14	74.20	761.50
379	30 (Dum	582,732.45	5,933,277.32	694.69	2.54	71.20	744.83
380	J-202	581,938.04	5,933,230.80	691.08	0	76.30	744.85
381	J-168	583,530.88	5,933,486.18	696.64	0	68.40	744.82
382	J-49	580,979.92	5,931,250.39	710.00	0.14	73.20	761.54
383	J-110	584,991.94	5,935,799.82	669.94	0.16	66.80	716.99
384	J-102	585,009.28	5,936,277.18	663.86	0.1	75.40	716.99

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
385	J-31	580,988.50	5,930,955.74	710.00	0	73.10	761.53
386	J-147	584,453.45	5,934,840.49	687.96	0	61.10	731.00
387	J-28	580,746.77	5,930,951.45	710.00	0	73.10	761.52
388	J-24	580,662.38	5,931,227.51	710.00	0.01	73.10	761.51
389	J-465	580,908.44	5,932,502.26	705.00	0	56.70	744.91
390	J-154	584,411.58	5,934,645.67	688.86	0.12	59.80	730.99
391	J-89	582,495.94	5,935,018.15	660.81	0.06	78.60	716.18
392	J-153	584,372.24	5,934,648.39	687.96	0.09	61.10	730.99
394	J-98	584,633.48	5,936,025.02	660.29	0.11	80.50	716.99
395	J-259	580,335.37	5,931,450.69	710.00	0.43	73.10	761.47
396	J-3	579,802.82	5,931,225.65	706.10	0.33	78.60	761.47
397	J-85	582,115.29	5,934,881.39	660.25	0	79.40	716.18
398	J-71	580,907.63	5,935,126.70	655.00	0.1	86.80	716.17
399	J-116	585,011.03	5,936,214.00	665.00	0.12	73.80	716.99
400	J-167	583,523.26	5,933,883.17	694.49	0	71.40	744.81
401	J-70	580,800.35	5,935,056.62	655.00	0.1	86.80	716.17
402	J-43	581,021.33	5,931,478.00	710.00	0	73.20	761.55
403	J-179	582,955.94	5,933,296.73	695.00	0	70.70	744.83
406	J-224	582,174.13	5,932,629.80	705.00	0.3	56.60	744.85
407	J-35	581,249.48	5,930,968.71	712.31	0	69.90	761.53
408	J-145	584,444.72	5,934,995.00	679.73	0	72.70	730.97
409	J-170	583,875.75	5,934,103.79	694.22	0	52.30	731.06
410	J-228	582,556.63	5,932,642.20	708.46	0.19	51.60	744.84
411	J-15	580,429.24	5,931,386.27	710.00	0.23	73.10	761.49
412	eson Zo	581,783.00	5,931,386.36	710.00	0.29	73.60	761.84
413	J-262	580,997.23	5,933,183.46	691.01	0	76.50	744.88
414	J-76	581,080.70	5,934,784.85	659.39	0	80.60	716.18
415	J-82	581,851.29	5,934,868.21	661.29	0	77.90	716.18
416	J-187	582,195.09	5,933,525.99	685.61	0.08	84.10	744.84
417	J-124	584,883.57	5,935,380.79	675.00	0	59.60	717.00
418	J-86	582,250.40	5,934,884.38	660.62	0.09	78.90	716.18
419	J-101	584,926.98	5,936,225.99	665.00	0.16	73.80	716.99
420	J-140	584,498.38	5,935,323.83	675.17	0.08	79.20	730.94
422	J-198	581,719.60	5,933,471.45	685.00	0.82	85.00	744.85
423	J-248	581,903.32	5,932,070.50	710.80	0	72.60	761.98
424	J-247	581,891.92	5,931,996.23	710.54	0	73.10	762.01
426	J-5	579,945.61	5,931,212.07	706.57	0	77.90	761.48
427	J-171	583,770.32	5,934,494.96	687.57	0.13	61.70	731.06
428	J-22	580,670.19	5,931,024.49	710.00	0.05	73.10	761.51
429	J-16	580,476.44	5,931,406.30	710.00	0	73.10	761.50
430	J-184	582,112.89	5,933,307.91	690.00	0.12	77.80	744.84
431	J-57	581,518.38	5,931,364.91	710.00	0.01	73.40	761.70
432	J-11	580,115.27	5,931,356.66	710.00	0.26	73.10	761.48
433	J-467	580,945.04	5,932,670.20	698.68	0.46	65.60	744.90
434	J-127	584,738.45	5,935,230.24	678.28	0.11	74.80	730.95
435	J-20	580,457.07	5,931,080.27	710.00	0.02	73.10	761.49
436	J-172	583,827.64	5,934,460.07	688.49	0.13	60.40	731.06

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437	J-157	584,429.91	5,934,843.88	686.75	0.06	62.80	731.01
438	J-161	583,932.31	5,934,795.27	682.13	0	69.40	731.04
439	J-114	584,722.31	5,935,766.42	668.89	0.01	68.30	716.99
440	J-149	584,407.51	5,934,758.25	688.05	0.06	60.90	730.99
441	akeshor	584,613.31	5,935,863.83	662.35	0.19	77.60	716.99
442	J-257	580,273.72	5,935,345.33	655.00	0.03	86.80	716.16
443	J-155	584,414.29	5,934,584.64	689.82	0.09	58.40	730.99
444	0 (Dumr	581,734.36	5,934,653.26	664.25	2.54	73.70	716.18
445	J-125	580,796.41	5,934,677.05	660.00	0.15	79.70	716.18
446	J-193	580,848.07	5,934,368.52	665.00	0.11	72.70	716.19
447	J-194	580,976.24	5,934,190.14	670.34	0.11	65.10	716.19
448	J-209	580,970.10	5,934,678.48	660.00	0.13	79.70	716.18
449	J-214	580,690.97	5,934,694.14	660.00	0	79.70	716.18
450	J-215	580,690.08	5,934,275.57	666.57	0	70.40	716.19
451	J-216	580,551.33	5,931,612.96	710.00	0	73.10	761.53
452	J-274	580,878.67	5,934,350.62	665.00	0	72.70	716.19
453	J-275	582,747.60	5,932,645.50	707.89	0.03	52.40	744.83
454	J-276	582,369.34	5,933,528.13	687.83	0.04	80.90	744.84
455	J-277	582,535.87	5,933,574.49	689.17	0.02	79.00	744.83
456	J-278	582,252.25	5,931,642.45	710.00	0	75.70	763.30
457	79 (Dum	582,429.55	5,931,644.90	712.34	2.54	73.30	763.97
458	J-280	582,657.75	5,931,650.26	715.00	0.78	70.80	764.89
460	J-317	582,199.34	5,932,409.79	709.00	0	50.90	744.85
461	preme S	579,529.45	5,930,618.12	710.00	0	73.10	761.47
462	J-369	580,329.98	5,930,530.83	711.57	0.09	70.80	761.48
463	J-413	584,962.80	5,935,893.67	667.76	0	69.90	716.99
464	J-414	580,992.55	5,933,333.24	690.00	0.02	77.90	744.88
465	J-415	580,322.26	5,930,836.93	709.65	0	73.60	761.49
466	J-416	580,996.56	5,933,257.52	690.00	0	77.90	744.88
467	J-417	581,409.37	5,930,749.49	710.00	0	73.10	761.52
468	J-418	581,473.62	5,930,748.31	710.00	0	73.10	761.52
469	J-426	581,027.60	5,931,617.03	710.00	0	73.20	761.57
470	J-427	581,474.51	5,931,632.42	711.07	0.36	71.90	761.73
472	J-433	581,230.40	5,931,623.34	710.40	0.04	72.70	761.60
473	J-455	585,032.66	5,934,913.17	682.73	0.03	68.50	730.96
474	J-456	584,578.32	5,935,458.14	674.14	0	60.80	717.00
475	J-457	584,473.57	5,935,561.72	668.91	0.06	68.30	717.00
476	J-458	584,552.88	5,935,630.17	668.40	0.03	69.00	717.00
477	J-459	584,630.33	5,935,622.09	670.00	0	66.70	717.00
478	J-460	584,399.04	5,935,479.51	669.91	0.05	66.80	717.00
479	J-462	584,407.26	5,935,625.71	666.69	0.02	71.40	717.00
480	J-473	584,318.20	5,935,632.34	665.00	0	73.80	717.00
481	J-474	580,907.43	5,933,564.98	687.95	0	80.80	744.87
482	J-475	584,394.68	5,934,582.93	689.24	0	59.30	730.99
483	J-476	584,378.97	5,934,558.28	688.81	0	59.90	730.99
484	J-477	584,385.26	5,934,422.76	691.17	0.14	56.50	730.99
485	J-478	584,452.79	5,934,337.14	695.00	0	51.10	730.99

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
486	J-479	584,456.37	5,934,203.11	695.00	0	51.10	730.99
487	J-480	584,346.35	5,934,199.50	695.00	0.06	51.10	730.99
488	untry Sq	584,451.06	5,934,432.27	692.57	0.01	54.50	730.99
489	J-482	584,501.53	5,934,435.28	693.17	0	53.70	730.99
490	J-483	582,554.17	5,934,938.61	661.50	0	77.60	716.18
491	J-484	580,257.71	5,934,709.77	655.00	0	86.80	716.16
492	J-485	580,164.03	5,934,700.83	655.00	0.04	86.80	716.16
493	Greenbria	580,160.09	5,934,602.78	655.28	0.14	86.40	716.16
494	J-487	580,157.19	5,934,461.58	658.62	0.05	81.70	716.16
495	J-488	580,264.39	5,934,426.70	660.00	0	79.70	716.16
496	J-489	580,262.15	5,934,273.16	662.79	0.03	75.80	716.16
497	J-490	580,263.09	5,934,169.52	664.93	0	72.70	716.16
498	J-491	580,263.09	5,934,052.82	668.12	0	68.20	716.16
499	J-492	580,603.96	5,933,233.91	687.77	0.06	81.10	744.89
500	J-493	580,285.22	5,933,229.98	685.12	0	84.80	744.89
501	J-494	580,019.98	5,933,222.44	681.92	0	89.40	744.89
502	J-496	579,846.07	5,933,216.09	683.33	0	87.40	744.89
503	J-497	579,558.48	5,933,207.86	680.78	0.65	91.00	744.89
504	J-498	579,384.04	5,933,248.61	680.76	0	91.00	744.89
505	J-499	580,585.32	5,935,532.59	655.00	0.12	86.80	716.16
506	J-500	580,800.29	5,934,469.04	664.91	0.1	72.80	716.19
507	Panatton	580,493.51	5,932,097.85	705.00	0.52	56.80	744.99
508	J-502	581,171.70	5,934,953.60	655.96	0.07	85.50	716.18
509	J-503	581,266.41	5,934,961.33	656.39	0.1	84.90	716.18
510	J-504	581,381.72	5,934,985.17	655.83	0.1	85.70	716.18
511	J-505	581,484.80	5,934,976.15	656.63	0.16	84.50	716.18
512	J-506	581,091.17	5,935,043.79	655.00	0.1	86.80	716.18
513	J-507	581,089.89	5,935,190.68	655.00	0.12	86.80	716.18
514	J-508	580,357.88	5,929,962.29	715.00	0	66.00	761.47
515	J-510	582,422.00	5,934,645.84	668.00	0	68.40	716.19
516	J-511	582,750.31	5,934,542.81	675.00	0	58.50	716.20
518	J-338	584,547.50	5,934,594.73	690.00	0	58.20	730.98
519	J-339	584,844.68	5,934,804.41	685.00	0.15	65.20	730.96
520	J-340	584,755.52	5,934,642.61	690.00	0.37	58.20	730.97
521	J-341	584,801.75	5,934,584.83	690.00	0	58.20	730.97
522	J-342	584,626.74	5,934,593.08	689.17	0	59.30	730.97
523	J-343	584,630.05	5,934,465.96	690.99	0.23	56.70	730.97
524	J-344	584,677.93	5,934,368.55	692.43	0	54.70	730.97
525	J-345	584,719.20	5,934,290.95	693.49	0.17	53.20	730.97
526	J-346	584,743.41	5,934,208.42	694.61	0	51.60	730.97
527	J-347	579,821.81	5,934,839.28	655.41	0	86.20	716.16
528	J-348	579,906.54	5,934,628.04	660.00	0.32	79.70	716.16
529	J-349	579,552.52	5,934,390.76	660.66	0.12	78.80	716.16
530	J-350	579,560.18	5,934,186.05	665.00	0	72.60	716.16
531	J-351	579,798.46	5,934,185.19	665.00	0	72.60	716.16
532	J-352	580,053.20	5,934,194.89	663.47	0	74.80	716.16
533	J-353	580,058.17	5,934,050.10	666.33	0	70.70	716.16

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
549	J-371	579,058.45	5,934,237.94	663.97	0	74.10	716.16
550	J-372	582,913.82	5,934,492.65	679.00	0	52.80	716.20
551	J-373	583,715.84	5,934,179.49	692.83	0	54.30	731.06
552	J-374	583,711.11	5,934,323.53	691.08	0	56.80	731.06
553	J-375	583,617.79	5,934,384.39	690.00	0	58.30	731.07
565	J-388	583,543.54	5,932,874.51	705.00	0	56.50	744.82
567	J-390	581,655.30	5,929,996.66	715.00	0.32	66.00	761.51
568	91 (Dum	580,970.38	5,929,997.16	715.00	2.54	66.00	761.47
569	J-392	580,813.36	5,929,007.00	720.00	0.05	58.80	761.44
570	J-393	581,663.98	5,929,028.48	715.00	16.89	65.90	761.43
593	J-424	581,660.97	5,929,623.62	713.50	0.1	68.10	761.48
594	J-425	581,665.24	5,929,366.79	715.00	0	65.90	761.45
602	J-437	584,749.37	5,934,767.29	686.86	0	62.60	730.96
614	J-449	581,421.38	5,932,595.83	704.53	0.79	57.30	744.90
615	J-450	579,529.68	5,930,833.39	710.00	0	73.10	761.47
616	J-451	582,718.01	5,933,794.15	686.82	0.29	82.30	744.82
617	J-452	584,568.62	5,934,437.45	692.38	0.26	54.80	730.97
618	J-453	584,709.29	5,934,821.05	685.00	0.24	65.20	730.96
619	J-454	578,967.63	5,931,180.10	705.00	0.32	80.20	761.47
621	J-481	579,912.34	5,929,983.06	710.05	0.43	73.00	761.47
623	J-495	581,742.29	5,930,634.26	710.00	0	73.10	761.52
624	J-514	581,024.45	5,930,758.71	710.00	0.17	73.10	761.51
1202	J-515	581,712.08	5,932,708.51	700.00	0.17	63.70	744.89
1205	J-516	581,669.94	5,929,192.84	715.00	0	65.90	761.43
1210	J-518	581,830.29	5,929,625.08	715.00	0	66.00	761.48
1212	J-519	581,835.07	5,929,999.06	715.66	0	65.10	761.51
1215	J-520	583,628.60	5,934,178.46	691.55	0	56.10	731.06
1217	J-521	579,709.90	5,934,475.78	661.19	0	78.00	716.16
1221	J-523	579,612.49	5,934,670.51	660.00	0	79.70	716.16
1223	J-524	579,458.36	5,934,392.85	660.00	0	79.70	716.16
1225	J-525	579,864.05	5,934,327.41	663.27	0	75.10	716.16
1247	J-529	581,722.82	5,930,546.21	711.81	0	70.60	761.52
1250	J-530	581,718.67	5,930,439.72	715.00	0	66.00	761.52
1252	J-531	581,695.54	5,930,265.84	715.00	0	66.00	761.51
1254	J-532	581,651.35	5,930,158.96	715.00	0	66.00	761.51
1261	J-535	580,317.76	5,932,082.48	705.00	0	56.80	745.01
1279	J-542	580,321.43	5,931,912.84	706.22	0	78.40	761.42
1303	J-550	579,304.34	5,931,106.29	705.49	0	79.50	761.47
1308	J-552	581,774.56	5,934,875.22	660.36	0.02	79.20	716.18
1310	J-553	584,830.76	5,934,337.70	691.53	0	56.00	730.97
1313	J-554	581,603.99	5,933,308.60	689.95	0	77.90	744.85
1317	J-555	581,321.58	5,933,537.76	685.33	0	84.50	744.85
1320	J-556	581,323.99	5,933,415.23	687.59	0	81.30	744.85
1322	J-557	581,250.04	5,933,467.96	686.55	0	82.80	744.85
1323	J-558	581,327.56	5,933,467.96	686.59	0	82.70	744.85
1330	J-560	584,062.95	5,933,663.17	698.76	0.44	65.40	744.82
1333	J-561	582,080.53	5,931,638.76	710.00	0	74.70	762.65

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1336	J-562	582,569.27	5,933,781.52	685.00	0.05	84.90	744.83
1339	J-563	583,023.88	5,933,806.52	689.56	0.99	78.40	744.82
1342	J-564	583,338.73	5,933,881.24	692.98	0	73.60	744.81
1345	J-565	582,744.06	5,932,889.49	701.99	0	60.80	744.83
1348	J-566	582,939.07	5,932,645.59	708.52	0.02	51.50	744.83
1351	J-567	583,002.33	5,932,556.57	709.00	0.05	50.90	744.83
1353	J-568	581,247.75	5,932,942.22	695.05	0	70.80	744.89
1356	J-569	580,577.37	5,932,096.86	705.31	0	56.30	744.98
1359	J-570	580,889.17	5,932,276.53	705.71	0	55.70	744.93
1362	J-571	580,880.65	5,932,177.12	706.82	0	54.10	744.94
1366	J-573	579,703.90	5,930,618.74	710.00	0.19	73.10	761.47
1369	J-574	579,904.79	5,930,431.14	710.00	0	73.10	761.47
1372	J-575	580,334.11	5,930,381.44	712.92	0	68.90	761.48
1375	J-576	581,433.82	5,929,694.07	715.00	1.67	66.00	761.48
1387	J-578	580,835.80	5,932,122.19	707.37	0	53.30	744.95
1390	J-579	579,380.19	5,933,203.20	681.18	0	90.40	744.89
1405	J-586	581,295.24	5,929,939.38	715.00	0.09	66.00	761.47
1452	J-602	579,239.65	5,934,831.22	656.38	0	84.90	716.16
1473	J-607	579,543.45	5,929,983.64	715.00	0	66.00	761.47
1475	J-608	580,203.48	5,929,958.96	713.28	0	68.40	761.47
1478	J-609	580,201.01	5,929,860.38	713.35	0	68.30	761.47
1480	J-610	580,552.48	5,929,989.36	715.00	0.71	66.00	761.47
1483	J-611	580,325.86	5,930,727.51	710.00	0	73.10	761.49
1499	J-613	584,353.40	5,933,669.57	695.76	0	69.60	744.82
1504	J-614	582,934.11	5,932,889.06	702.94	0	59.50	744.83
1556	J-628	580,375.92	5,929,164.92	717.44	0	62.50	761.45
1559	J-629	580,365.57	5,929,526.73	705.00	0	80.10	761.46
1619	J-634	580,375.70	5,929,000.34	718.77	0	60.60	761.45
1681	J-642	581,668.12	5,929,095.99	715.00	0	65.90	761.43
1741	J-647	581,271.30	5,929,015.97	720.00	0	58.80	761.43
1744	48 (Dum	581,275.92	5,928,657.02	720.00	2.54	58.80	761.43
1746	J-649	581,116.31	5,928,684.12	720.00	0	58.80	761.43
1748	J-650	581,110.60	5,929,012.69	721.17	0	57.10	761.43
1857	J-662	581,970.85	5,935,022.33	659.84	0	80.00	716.18
1859	J-663	582,116.21	5,935,056.50	657.14	0	83.80	716.18
1930	J-668	579,102.84	5,931,112.30	705.76	0	79.10	761.47
1949	J-675	579,907.29	5,930,219.27	710.00	0	73.10	761.47
1952	J-676	580,043.39	5,929,961.76	711.50	0	70.90	761.47
1965	J-682	578,966.18	5,934,323.21	662.52	0	76.10	716.16
1974	J-685	580,448.50	5,933,230.44	686.51	0	82.90	744.89
1980	J-687	580,334.63	5,930,185.02	714.34	0	66.90	761.47
1983	J-688	580,557.45	5,930,744.75	710.00	0	73.10	761.50
1986	J-689	581,209.13	5,929,990.60	715.00	0	66.00	761.47
1989	J-690	582,115.87	5,934,642.64	665.83	0	71.5	716.19
1995	J-692	580,367.90	5,935,411.75	655	0	86.8	716.16
1998	J-693	580,939.14	5,935,207.44	655	0	86.8	716.17
2001	J-694	581,593.23	5,933,015.33	699.23	0	64.8	744.87

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
2004	J-695	581,706.64	5,932,861.89	698.36	0	66	744.88
2009	J-697	580,594.61	5,929,003.29	722.94	0	54.7	761.44
2012	J-698	579,772.86	5,930,616.65	710	0	73.1	761.47
2015	J-699	581,656.96	5,929,786.31	715	0	66	761.49
2024	J-701	579,705.90	5,933,212.88	682	0	89.3	744.89
2048	J-709	584,218.05	5,933,682.14	696.07	0	69.2	744.82
2142	J-719	582,112.92	5,929,042.77	714.67	0	66.4	761.43
2145	J-720	581,900.54	5,929,036.19	714.83	0	66.1	761.43
2148	J-721	585,115.48	5,935,430.98	672.05	0	63.8	716.99
2153	J-723	581,364.59	5,933,637.12	683.4	0	87.2	744.85
2155	J-724	581,503.77	5,933,636.39	683.4	0	87.2	744.85
2157	J-725	581,505.07	5,933,898.96	680	0	92.1	744.85

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
654	P-120	J-102	J-116	63.00	200	120.00	0.00	0	0	0	PVC
655	P-156	J-147	J-148	80.00	200	120.00	3.21	0.1	0.007	0.093	PVC
656	P-78	J-73	J-74	58.00	200	120.00	-0.82	0.03	0	0.008	PVC
657	P-95	J-90	J-91	95.00	200	120.00	0.00	0	0	0	PVC
658	P-74	J-69	J-70	140.00	200	120.00	-1.40	0.04	0.003	0.02	PVC
659	P-201	J-191	J-192	96.00	300	120.00	-4.36	0.06	0.002	0.022	PVC
660	P-5	J-5	J-7	173.00	200	120.00	-2.22	0.07	0.008	0.047	PVC
661	P-119	J-115	J-109	130.00	200	120.00	1.05	0.03	0.001	0.011	PVC
662	P-307(2)	J-471	J-470	147.00	300	120.00	-3.95	0.06	0.003	0.019	PVC
663	P-216	J-205	J-206	353.00	300	120.00	-5.93	0.08	0.01	0.04	PVC
664	P-124	J-119	J-110	95.00	200	120.00	0.33	0.01	0	0.002	PVC
665	P-17	J-17	J-18	122.00	300	110.00	-3.79	0.05	0.003	0.021	Asbestos Cement
666	P-11	J-11	J-12	113.00	300	120.00	-2.00	0.03	0.001	0.005	PVC
667	P-73	J-68	J-69	169.00	200	120.00	-1.25	0.04	0.003	0.016	PVC
668	P-235	J-223	J-224	98.00	300	120.00	-3.90	0.06	0.002	0.019	PVC
669	P-46	J-44	J-45	77.00	300	110.00	8.29	0.12	0.008	0.087	Asbestos Cement
670	P-152	J-131	J-145	12.00	200	120.00	-2.84	0.09	0.001	0.071	PVC
671	P-141	J-134	J-135	126.00	150	120.00	1.02	0.06	0.006	0.045	PVC
672	P-30	J-28	J-29	73.00	300	110.00	-6.81	0.1	0.004	0.06	Asbestos Cement
673	P-195	J-185	J-186	131.00	300	120.00	3.25	0.05	0.002	0.013	PVC
674	P-306(2)	J-472	J-471	85.00	300	120.00	-3.95	0.06	0.001	0.02	PVC
675	P-215	J-204	J-205	197.00	300	120.00	-5.93	0.08	0.008	0.04	PVC
676	P-159	J-150	J-151	35.00	200	120.00	0.32	0.01	0	0.002	PVC
677	P-16	J-13	J-17	156.00	300	110.00	-3.79	0.05	0.003	0.02	Asbestos Cement
678	P-160	J-151	J-152	71.00	200	120.00	0.25	0.01	0	0	PVC
679	P-110	J-106	J-107	37.00	200	120.00	-0.12	0	0	0	PVC
680	P-10	J-10	J-11	167.00	300	120.00	-1.74	0.02	0.001	0.004	PVC
681	P-234	J-222	J-223	81.00	300	120.00	-3.89	0.05	0.001	0.018	PVC
682	P-72	J-67	J-58	158.00	300	110.00	24.67	0.35	0.108	0.656	Asbestos Cement
683	P-135	J-128	J-129	126.00	150	120.00	0.11	0.01	0	0.001	PVC
684	P-26	J-25 (Dummy)	J-26	119.00	300	110.00	-2.01	0.03	0.001	0.007	Asbestos Cement
685	P-172	J-162	J-163	145.00	300	120.00	-7.55	0.11	0.009	0.062	PVC
686	P-140	J-133	J-134	114.00	200	120.00	1.12	0.04	0.001	0.013	PVC
687	P-158	J-149	J-150	30.00	200	120.00	0.32	0.01	0	0	PVC
688	P-52	J-49	J-50	146.00	300	110.00	4.11	0.06	0.003	0.023	Asbestos Cement
689	P-148	J-129	J-141	83.00	150	120.00	0.00	0	0	0	PVC
690	P-182	J-173	J-174	102.00	200	120.00	-0.31	0.01	0	0.001	PVC
691	P-282	J-252	J-253	357.00	300	120.00	0.02	0	0	0	PVC
692	P-217	J-206	J-207	75.00	300	120.00	-15.71	0.22	0.04	0.242	PVC
693	P-15	J-15	J-16	51.00	300	110.00	-9.29	0.13	0.006	0.108	Asbestos Cement
694	P-109	J-99	J-106	76.00	200	120.00	-0.02	0	0	0	PVC
695	P-142	J-135	J-136	88.00	200	120.00	1.73	0.06	0.003	0.029	PVC
696	P-181	J-172	J-173	65.00	200	120.00	-0.08	0	0	0	PVC
697	P-71	J-66	J-67	156.00	300	110.00	24.68	0.35	0.097	0.656	Asbestos Cement
698	P-193	J-183	J-184	75.00	300	120.00	3.80	0.05	0.001	0.018	PVC
699	P-238	J-226	J-227	86.00	300	120.00	5.52	0.08	0.006	0.035	PVC
700	P-157	J-148	J-149	48.00	200	120.00	0.80	0.03	0	0.008	PVC
701	P-75	J-70	J-71	128.00	200	120.00	0.21	0.01	0	0.001	PVC
702	P-147	J-129	J-140	62.00	150	120.00	2.51	0.14	0.015	0.236	PVC
703	P-129	J-122	J-123	62.00	200	120.00	-1.06	0.03	0.001	0.012	PVC
704	P-92	J-87	J-88	83.00	200	120.00	0.42	0.01	0	0.002	PVC
705	P-171	J-161	J-162	175.00	300	120.00	-7.55	0.11	0.011	0.062	PVC
706	P-206	J-196	J-197	78.00	300	120.00	-0.12	0	0	0	PVC
707	P-45	J-43	J-44	40.00	300	110.00	12.54	0.18	0.008	0.186	Asbestos Cement
708	P-258	PMP-101	J-234	2.00	150	120.00	0.00	0	0	0	PVC
709	P-276	J-248	J-211	11.00	300	120.00	20.40	0.29	0.011	0.393	PVC
710	P-189	J-179	J-180 (Dummy)	237.00	350	120.00	-5.40	0.06	0.004	0.016	PVC
711	P-33	J-31	J-32	76.00	300	110.00	-2.79	0.04	0.001	0.012	Asbestos Cement
712	P-84	J-79	J-80 (Dummy)	386.00	250	120.00	1.03	0.02	0.001	0.004	PVC
713	P-255	PMP-104	J-237	2.00	250	120.00	0.00	0	0	0	PVC
714	P-29	J-27	J-28	77.00	300	110.00	-6.81	0.1	0.005	0.061	Asbestos Cement
715	P-118	J-114	J-115	108.00	200	120.00	1.11	0.04	0.001	0.013	PVC
716	P-9	J-5	J-10	137.00	200	120.00	-1.53	0.05	0.003	0.024	PVC
718	P-229	J-217	J-218	31.00	300	120.00	-49.01	0.69	0.062	1.989	PVC
719	P-265	J-241	PMP-103	2.00	600	120.00	0.00	0	0	0	PVC
720	P-210	J-200	J-201	211.00	300	120.00	1.93	0.03	0.001	0.005	PVC
721	P-232	J-220	J-221	94.00	300	120.00	-3.89	0.05	0.002	0.018	PVC
722	P-32	J-30	J-31	86.00	300	110.00	-6.90	0.1	0.005	0.061	Asbestos Cement
723	P-108	J-96	J-105	160.00	200	120.00	0.18	0.01	0	0	PVC
724	P-133	J-126	J-127	125.00	150	120.00	0.48	0.03	0.001	0.011	PVC
725	P-174	J-164	J-165	87.00	300	120.00	-8.73	0.12	0.007	0.082	PVC
726	P-134	J-127	J-128	116.00	150	120.00	0.37	0.02	0.001	0.006	PVC
727	P-190	J-180 (Dummy)	J-181	119.00	350	120.00	-5.81	0.06	0.003	0.018	PVC
728	P-211	J-201	J-202	129.00	360	120.00	7.58	0.07	0.003	0.025	HDPE
729	P-300	OLD FIRE PUMP	J-265	145.00	300	120.00	0.00	0	0	0	PVC
730	P-144	J-122	J-137	191.00	200	120.00	-0.75	0.02	0.001	0.006	PVC
731	P-231	J-219	J-220	100.00	300	120.00	-3.60	0.05	0.002	0.016	PVC
732	P-70	J-65	J-66	106.00	300	110.00	-16.32	0.23	0.034	0.305	Asbestos Cement
733	P-35	J-33	J-34	60.00	300	110.00	-2.90	0.04	0.001	0.012	Asbestos Cement
734	P-117	J-113	J-114	51.00	200	120.00	-0.57	0.02	0	0.004	PVC
735	P-184	J-175	J-177	34.00	200	120.00	-0.52	0.02	0	0.002	PVC
736	P-112	J-108	J-109	88.00	200	120.00	-0.17	0.01	0	0.001	PVC
737	P-150	J-141	J-143	23.00	150	120.00	0.00	0	0	0	PVC
738	P-177	J-167	J-168	458.00	300	120.00	-3.17	0.04	0.005	0.013	PVC
739	P-115	J-97	Lakeshore	143.00	200	120.00	-0.38	0.01	0	0.002	PVC
740	P-192	J-182	J-183	257.00	350	120.00	-7.29	0.08	0.007	0.028	PVC
741	P-251	J-235	J-236	2.00	400	120.00	0.00	0	0	0	PVC
742	P-68	J-63	Acheson Zone 3	124.00	300	110.00	-16.03	0.23	0.037	0.295	Asbestos Cement
743	P-309	J-469	J-468 (Dummy)	89.00	300	120.00	-3.95	0.06	0.002	0.019	PVC
744	P-146	J-128	J-139	63.00	150	120.00	0.12	0.01	0	0.001	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
745	P-97	J-93	J-94	73.00	200	120.00	-0.20	0.01	0	0.001	PVC
746	P-237	J-224	J-226	96.00	300	120.00	5.59	0.08	0.003	0.036	PVC
747	P-128	J-121	J-122	38.00	200	120.00	-1.74	0.06	0.001	0.029	PVC
748	P-22	J-21	J-22	200.00	300	110.00	-6.09	0.09	0.01	0.049	Asbestos Cement
749	P-122	J-117	J-118	130.00	200	120.00	-0.25	0.01	0	0.001	PVC
750	P-230	J-183	J-219	149.00	300	120.00	-3.51	0.05	0.002	0.015	PVC
751	P-104	J-100	J-101	111.00	200	120.00	0.38	0.01	0	0.002	PVC
753	P-61	J-57	J-58	116.00	300	110.00	-4.70	0.07	0.004	0.03	Asbestos Cement
754	P-126	J-114	J-120	75.00	200	120.00	-1.69	0.05	0.002	0.028	PVC
755	P-28	J-22	J-27	72.00	300	110.00	-6.72	0.1	0.004	0.059	Asbestos Cement
756	P-44	J-42	J-43	77.00	300	110.00	12.54	0.18	0.013	0.188	Asbestos Cement
757	P-197	J-187	J-188	74.00	300	120.00	3.17	0.04	0.001	0.012	PVC
758	P-20	J-19	J-20	49.00	300	110.00	-5.93	0.08	0.003	0.047	Asbestos Cement
759	P-80	J-75	J-76	179.00	200	120.00	-1.47	0.05	0.004	0.022	PVC
760	P-261	J-241	J-242	2.00	600	120.00	0.00	0	0	0	PVC
761	P-298	J-234	J-265	2.00	300	120.00	0.00	0	0	0	PVC
762	P-102	J-98	J-99	87.00	200	120.00	0.80	0.03	0.001	0.007	PVC
763	P-254	J-238	PMP-105	2.00	250	120.00	0.00	0	0	0	PVC
764	P-291	J-192	J-264	218.00	300	120.00	-2.29	0.03	0.001	0.007	PVC
765	P-281	J-14	J-259	44.00	300	120.00	10.83	0.15	0.008	0.122	PVC
766	P-64	J-60	J-40	31.00	300	110.00	17.67	0.25	0.012	0.353	Asbestos Cement
767	P-3	J-3	J-4	65.00	300	120.00	-3.75	0.05	0.001	0.017	PVC
768	P-83	J-78	J-79	214.00	250	120.00	1.03	0.02	0.001	0.004	PVC
769	P-14	J-14	J-15	120.00	300	110.00	-9.06	0.13	0.01	0.102	Asbestos Cement
770	P-58	J-54	J-55	167.00	300	110.00	-17.88	0.25	0.06	0.361	Asbestos Cement
771	P-55	J-51	J-52	57.00	300	110.00	-17.74	0.25	0.018	0.356	Asbestos Cement
772	P-167	J-157	J-158	22.00	250	120.00	-7.55	0.15	0.003	0.15	PVC
773	P-137	J-130	J-131	98.00	200	120.00	-2.70	0.09	0.007	0.067	PVC
774	P-105	J-101	J-102	98.00	200	120.00	0.22	0.01	0	0.001	PVC
775	P-101	J-97	J-98	173.00	200	120.00	0.91	0.03	0.002	0.009	PVC
776	P-188	J-178	J-179	247.00	350	120.00	-5.40	0.06	0.004	0.016	PVC
777	P-228	J-217	J-66	67.00	300	120.00	49.01	0.69	0.125	1.99	PVC
778	P-38	J-36	J-37	94.00	300	110.00	-9.47	0.13	0.01	0.111	Asbestos Cement
779	P-41	J-39	J-40	154.00	300	110.00	-9.50	0.13	0.018	0.112	Asbestos Cement
780	P-154	J-145	J-146	133.00	200	120.00	-4.28	0.14	0.02	0.157	PVC
781	P-63	J-59	J-60	123.00	300	110.00	17.67	0.25	0.042	0.354	Asbestos Cement
782	P-164	J-149	J-156	36.00	200	120.00	0.42	0.01	0	0.002	PVC
784	P-287	J-257	J-255	556.00	200	120.00	-0.25	0.01	0	0.001	HDPE
785	P-59	J-55	J-56 (Dummy)	74.00	300	110.00	-2.15	0.03	0.001	0.007	Asbestos Cement
786	P-243	J-231	J-73	144.00	200	120.00	1.12	0.04	0.002	0.013	PVC
787	P-264	J-242	PMP-102	2.00	600	120.00	0.00	0	0	0	PVC
788	P-7	J-7	J-8	371.00	300	120.00	-2.25	0.03	0.002	0.007	PVC
789	P-268	R-1	J-239	2.00	600	120.00	0.00	0	0	0	PVC
790	P-88	J-83	J-84	56.00	200	120.00	0.63	0.02	0	0.004	PVC
791	P-121	J-116	J-117	92.00	200	120.00	-0.12	0	0	0.001	PVC
792	P-79	J-74	J-75	142.00	200	120.00	-0.82	0.03	0.001	0.007	PVC
793	P-24	J-23	J-24	158.00	300	110.00	0.54	0.01	0	0	Asbestos Cement
794	P-47	J-45	J-46	103.00	300	110.00	8.21	0.12	0.008	0.086	Asbestos Cement
795	P-31	J-29	J-30	83.00	300	110.00	-6.83	0.1	0.005	0.061	Asbestos Cement
796	P-196	J-186	J-187	92.00	300	120.00	3.25	0.05	0.001	0.013	PVC
797	P-107	J-94	J-104	107.00	200	120.00	-1.18	0.04	0.002	0.015	PVC
799	P-161	J-152	J-153	68.00	200	120.00	0.51	0.02	0	0.003	PVC
800	P-250	J-234	J-235	2.00	400	120.00	0.00	0	0	0	PVC
801	P-136	J-129	J-130	187.00	200	120.00	-2.60	0.08	0.012	0.062	PVC
802	P-27	J-26	J-16	95.00	300	110.00	9.29	0.13	0.011	0.108	Asbestos Cement
803	P-173	J-163	J-164	99.00	300	120.00	-7.73	0.11	0.006	0.065	PVC
804	P-66	J-61	J-62	112.00	300	110.00	-15.89	0.22	0.032	0.29	Asbestos Cement
805	P-284	J-68	J-255	311.00	200	120.00	1.10	0.04	0.004	0.013	HDPE
806	P-257	PMP-102	J-235	2.00	150	120.00	0.00	0	0	0	PVC
807	P-218	J-207	J-208	408.00	300	120.00	4.54	0.06	0.01	0.024	PVC
808	P-239	J-227	J-228	96.00	300	120.00	5.51	0.08	0.004	0.035	PVC
809	P-18	J-18	J-8	31.00	300	110.00	2.14	0.03	0	0.007	Asbestos Cement
811	P-130	J-123	J-124	65.00	200	120.00	-1.08	0.03	0.001	0.013	PVC
812	P-143	J-136	J-126	89.00	200	120.00	1.73	0.06	0.003	0.029	PVC
813	P-93	J-88	J-89	68.00	200	120.00	0.25	0.01	0	0	PVC
814	P-207	J-197	J-198	121.00	300	120.00	0.84	0.01	0	0.001	PVC
815	P-149	J-141	J-142	40.00	150	120.00	0.00	0	0	0	PVC
816	P-259	J-239	J-240	2.00	600	120.00	0.00	0	0	0	PVC
817	P-34	J-32	J-33	60.00	300	110.00	-2.89	0.04	0.001	0.013	Asbestos Cement
818	P-85	J-80 (Dummy)	J-81	125.00	250	120.00	-1.51	0.03	0.001	0.008	PVC
819	P-256	PMP-103	J-236	2.00	200	120.00	0.00	0	0	0	PVC
820	P-183	J-174	J-175	119.00	200	120.00	-0.44	0.01	0	0.003	PVC
821	P-266	J-240	PMP-104	2.00	600	120.00	0.00	0	0	0	PVC
822	P-111	J-107	J-108	99.00	200	120.00	-0.12	0	0	0	PVC
823	P-308(2)	J-470	J-469	207.00	300	120.00	-3.95	0.06	0.004	0.019	PVC
824	P-233	J-221	J-222	79.00	300	120.00	-3.89	0.05	0.001	0.018	PVC
825	P-175	J-165	J-166	352.00	300	120.00	-10.89	0.15	0.036	0.123	PVC
826	P-53	J-50	J-31	149.00	300	110.00	4.11	0.06	0.004	0.024	Asbestos Cement
827	P-96	J-86	J-92	190.00	200	120.00	0.09	0	0	0	PVC
828	P-191	J-181	J-182	234.00	350	120.00	-6.29	0.07	0.003	0.021	PVC
831	P-145	J-138	J-128	73.00	150	120.00	0.00	0	0	0	PVC
832	P-273	J-218	J-246	35.00	300	120.00	-49.01	0.69	0.059	1.99	PVC
833	P-185	J-177	J-170	76.00	200	120.00	0.00	0	0	0	PVC
834	P-213	J-201	J-203	142.00	300	120.00	-5.66	0.08	0.005	0.037	PVC
835	P-114	J-110	J-111	107.00	200	120.00	0.17	0.01	0	0.001	PVC
836	P-178	J-168	J-169	64.00	300	120.00	-3.09	0.04	0.001	0.012	PVC
837	P-151	J-143	J-144	26.00	150	120.00	0.00	0	0	0	PVC
838	P-67	J-62	J-63	99.00	300	110.00	-15.89	0.22	0.029	0.29	Asbestos Cement
839	P-310(2)	J-468 (Dummy)	J-467	69.00	300	120.00	-6.49	0.09	0.004	0.047	PVC
840	P-42	J-40	J-41	91.00	300	110.00	12.65	0.18	0.018	0.19	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
841	P-123	J-109	J-119	21.00	200	120.00	0.78	0.02	0	0.007	PVC
842	P-12	J-12	J-13	89.00	300	120.00	-2.00	0.03	0.001	0.006	PVC
843	P-127	J-120	J-121	205.00	200	120.00	-1.69	0.05	0.006	0.028	PVC
844	P-39	J-37	J-38	110.00	300	110.00	-9.48	0.13	0.012	0.112	Asbestos Cement
845	P-198	J-76	J-189	340.00	250	120.00	-2.50	0.05	0.006	0.02	PVC
846	P-21	J-20	J-21	62.00	300	110.00	-5.95	0.08	0.003	0.047	Asbestos Cement
847	P-252	J-236	J-237	2.00	400	120.00	0.00	0	0	0	PVC
848	P-81	J-76	J-77	87.00	250	120.00	1.03	0.02	0	0.003	PVC
849	P-293	J-264	J-261	179.00	300	120.00	-4.56	0.06	0.004	0.025	PVC
850	P-236	J-224	J-225	82.00	300	120.00	0.00	0	0	0	PVC
851	P-69	Acheson Zone 3	J-65	123.00	300	110.00	-16.32	0.23	0.038	0.305	Asbestos Cement
852	P-65	J-55	J-61	151.00	300	110.00	-15.86	0.22	0.044	0.289	Asbestos Cement
853	P-4	J-4	J-5	124.00	300	120.00	-3.75	0.05	0.002	0.017	PVC
854	P-168	J-158	J-159	265.00	300	120.00	-7.55	0.11	0.017	0.063	PVC
855	P-56	J-52	J-53	70.00	300	110.00	-17.74	0.25	0.027	0.355	Asbestos Cement
856	P-139	J-132	J-133	106.00	200	120.00	1.35	0.04	0.002	0.019	PVC
857	P-36	J-34	J-35	61.00	300	110.00	-2.90	0.04	0.001	0.012	Asbestos Cement
858	P-103	J-99	J-100	157.00	200	120.00	0.58	0.02	0.001	0.004	PVC
859	P-98	J-94	J-95	59.00	200	120.00	0.98	0.03	0.001	0.01	PVC
860	P-116	Lakeshore	J-113	107.00	200	120.00	-0.57	0.02	0	0.003	PVC
861	P-305(2)	J-262	J-472	275.00	300	120.00	-3.24	0.05	0.003	0.013	PVC
863	P-165	J-156	J-152	29.00	200	120.00	0.42	0.01	0	0	PVC
864	P-221	J-210	J-211	208.00	300	120.00	-20.40	0.29	0.082	0.392	PVC
865	P-60	J-56 (Dummy)	J-57	133.00	300	110.00	-4.69	0.07	0.004	0.03	Asbestos Cement
866	P-244	J-135	J-232	151.00	200	120.00	-0.94	0.03	0.001	0.01	PVC
867	P-106	J-102	J-103	82.00	200	120.00	0.12	0	0	0	PVC
868	P-269	J-35	J-244	73.00	350	120.00	24.07	0.25	0.006	0.25	PVC
869	P-89	J-84	J-85	64.00	200	120.00	0.60	0.02	0	0.005	PVC
870	P-25	J-24	J-25 (Dummy)	124.00	300	110.00	0.53	0.01	0	0.001	Asbestos Cement
871	P-23	J-22	J-23	47.00	300	110.00	0.58	0.01	0	0	Asbestos Cement
872	P-37	J-35	J-36	106.00	300	110.00	-9.47	0.13	0.012	0.112	Asbestos Cement
873	P-43	J-41	J-42	45.00	300	110.00	12.60	0.18	0.009	0.189	Asbestos Cement
874	P-19	J-18	J-19	89.00	300	110.00	-5.93	0.08	0.004	0.046	Asbestos Cement
876	P-77	J-70	J-73	144.00	200	120.00	-1.71	0.05	0.004	0.028	PVC
877	P-94	J-89	J-90	141.00	200	120.00	0.19	0.01	0	0.001	PVC
878	P-260	J-240	J-241	2.00	600	120.00	0.00	0	0	0	PVC
879	P-267	J-239	PMP-105	2.00	600	120.00	0.00	0	0	0	PVC
880	P-297	J-243	OLD FIRE PUMP	4.00	500	120.00	0.00	0	0	0	PVC
881	P-253	J-237	J-238	2.00	400	120.00	0.00	0	0	0	PVC
882	P-186	J-176	J-177	48.00	200	120.00	0.52	0.02	0	0.003	PVC
883	P-86	J-81	J-82	220.00	200	120.00	0.65	0.02	0.001	0.005	PVC
884	P-274	J-246	J-247	370.00	300	120.00	20.40	0.29	0.144	0.393	PVC
885	P-214	J-203	J-204	29.00	300	120.00	-5.93	0.08	0.001	0.038	PVC
886	P-311(2)	J-467	J-466	82.00	300	120.00	-6.95	0.1	0.004	0.054	PVC
887	P-194	J-184	J-185	66.00	300	120.00	3.68	0.05	0.001	0.016	PVC
888	P-40	J-38	J-39	44.00	300	110.00	-9.50	0.13	0.005	0.113	Asbestos Cement
889	P-199	J-189	J-190	318.00	300	120.00	-4.36	0.06	0.007	0.023	PVC
890	P-162	J-153	J-154	39.00	200	120.00	0.42	0.01	0	0.002	PVC
891	P-82	J-77	J-78	43.00	250	120.00	1.03	0.02	0	0.003	PVC
892	P-54	J-35	J-51	62.00	300	110.00	-17.50	0.25	0.022	0.348	Asbestos Cement
893	P-57	J-53	J-54	91.00	300	110.00	-17.86	0.25	0.033	0.361	Asbestos Cement
894	P-99	J-95	J-96	66.00	200	120.00	0.94	0.03	0.001	0.009	PVC
895	P-166	J-147	J-157	23.00	200	120.00	-7.49	0.24	0.01	0.441	PVC
896	P-222	J-211	J-212	47.00	300	120.00	0.00	0	0	0	PVC
897	P-245	J-133	J-233	76.00	200	120.00	0.14	0	0	0	PVC
898	P-1	J-1	J-2	158.00	300	120.00	-3.01	0.04	0.002	0.011	PVC
899	P-90	J-85	J-86	140.00	200	120.00	0.60	0.02	0.001	0.004	PVC
900	P-13	J-13	J-14	30.00	300	110.00	1.77	0.03	0	0.004	Asbestos Cement
901	P-48	J-46	J-47	139.00	300	110.00	8.21	0.12	0.012	0.085	Asbestos Cement
903	P-155	J-146	J-147	23.00	200	120.00	-4.28	0.14	0.004	0.158	PVC
904	P-302(2)	J-259	J-461	628.00	300	120.00	10.40	0.15	0.038	0.113	PVC
905	P-240	J-208	J-230	357.00	300	120.00	-2.80	0.04	0.003	0.01	PVC
906	P-187	J-168	J-178	363.00	350	120.00	-5.16	0.05	0.005	0.015	PVC
907	P-262	J-242	J-243	2.00	600	120.00	0.00	0	0	0	PVC
908	P-275	J-247	J-248	75.00	300	120.00	20.40	0.29	0.03	0.392	PVC
909	P-312(2)	J-466	J-465	94.00	300	120.00	-6.95	0.1	0.005	0.053	PVC
910	P-153	J-145	J-132	114.00	200	120.00	1.44	0.05	0.002	0.02	PVC
911	P-62	J-58	J-59	127.00	300	110.00	19.94	0.28	0.057	0.442	Asbestos Cement
912	P-163	J-154	J-155	61.00	200	120.00	0.30	0.01	0	0.001	PVC
913	P-208	J-198	J-199	68.00	300	120.00	0.02	0	0	0	PVC
914	P-100	J-96	J-97	141.00	200	120.00	0.65	0.02	0.001	0.005	PVC
915	P-91	J-86	J-87	166.00	200	120.00	0.42	0.01	0	0.002	PVC
916	P-49	J-47	J-26	98.00	300	110.00	8.19	0.12	0.008	0.085	Asbestos Cement
917	P-314(2)	J-464	J-230	207.00	300	120.00	2.84	0.04	0.002	0.01	PVC
918	P-242	J-229	J-230	45.00	250	120.00	-0.04	0	0	0	PVC
919	P-6	J-7	J-6	24.00	200	120.00	0.03	0	0	0	PVC
920	P-263	J-243	PMP-101	2.00	600	120.00	0.00	0	0	0	PVC
921	P-2	J-2	J-3	142.00	300	120.00	-3.42	0.05	0.002	0.014	PVC
922	P-180	J-171	J-172	67.00	200	120.00	0.05	0	0	0	PVC
923	P-50	J-44	J-48	97.00	300	110.00	4.25	0.06	0.003	0.025	Asbestos Cement
924	P-169	J-159	J-160	124.00	300	120.00	-7.55	0.11	0.008	0.062	PVC
925	P-315(2)	J-465	J-464	45.00	300	120.00	-6.95	0.1	0.002	0.053	PVC
926	P-87	J-82	J-83	149.00	200	120.00	0.63	0.02	0.001	0.004	PVC
927	P-51	J-48	J-49	123.00	300	110.00	4.25	0.06	0.003	0.025	Asbestos Cement
928	P-170	J-160	J-161	104.00	300	120.00	-7.55	0.11	0.007	0.063	PVC
929	P-179	J-163	J-171	113.00	200	120.00	0.18	0.01	0	0.001	PVC
930	P-113	J-231	J-125	185.00	200	120.00	-1.12	0.04	0.002	0.013	PVC
931	P-203	J-125	J-209	180.00	200	120.00	0.13	0	0	0	PVC
932	P-204	J-125	J-214	107.00	200	120.00	0.00	0	0	0	PVC
933	P-205	J-193	J-215	201.00	300	120.00	0.00	0	0	0	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
934	P-219	J-26	J-216	167.00	200	110.00	-3.14	0.1	0.017	0.103	Asbestos Cement
935	P-303	J-193	J-274	39.00	300	120.00	-1.61	0.02	0	0.004	PVC
936	P-305	J-274	J-194	198.00	200	120.00	0.11	0	0	0	PVC
937	P-306	J-189	J-274	249.00	300	120.00	1.72	0.02	0.001	0.004	PVC
938	P-307	J-228	J-275	314.00	300	120.00	5.32	0.08	0.006	0.032	PVC
940	P-310	J-188	J-276	110.00	300	120.00	3.17	0.04	0.001	0.012	PVC
941	P-311	J-276	J-182	265.00	300	120.00	-0.85	0.01	0	0.001	PVC
942	P-312	J-276	J-277	170.00	300	120.00	3.98	0.06	0.003	0.019	PVC
944	P-314	J-278	J-279 (Dummy)	172.00	300	120.00	-69.41	0.98	0.672	3.79	PVC
945	P-315	J-279 (Dummy)	J-280	255.00	300	120.00	-71.95	1.02	0.925	4.051	PVC
946	P-413	J-369	J-9	217.00	300	120.00	-4.85	0.07	0.005	0.027	PVC
947	P-463	J-119	J-413	36.00	150	120.00	0.45	0.03	0	0.01	PVC
948	P-464	J-413	J-118	118.00	200	120.00	0.45	0.01	0	0.003	PVC
949	P-466	J-414	J-263	264.00	300	120.00	6.92	0.1	0.011	0.053	PVC
950	P-467	J-8	J-415	209.00	300	120.00	-0.24	0	0	0	PVC
952	P-469	J-262	J-416	50.00	300	120.00	6.94	0.1	0.004	0.053	PVC
953	P-470	J-416	J-414	71.00	300	120.00	6.94	0.1	0.004	0.054	PVC
954	P-471	J-244	J-417	188.00	600	120.00	24.07	0.09	0.006	0.018	HDPE
955	P-472	J-417	J-418	70.00	600	120.00	18.76	0.07	0.001	0.012	PVC
956	P-483	J-216	J-426	467.00	200	110.00	-3.14	0.1	0.049	0.104	Asbestos Cement
957	P-485	J-427	J-66	310.00	200	110.00	-8.02	0.26	0.179	0.589	Asbestos Cement
958	P-491	R-3	J-432	2.00	350	120.00	72.74	0.76	0.004	1.935	PVC
959	P-492	J-432	PMP-1	2.00	350	120.00	72.74	0.76	0.004	1.972	PVC
960	P-493	PMP-1	J-281	2.00	350	120.00	72.74	0.76	0.004	1.972	PVC
961	P-494	J-238	PRV-4	3.00	350	120.00	0.00	0	0	0	PVC
962	P-495	PRV-4	J-244	3.00	350	120.00	0.00	0	0	0	PVC
963	P-496	PRV-5	J-280	37.00	400	120.00	72.73	0.58	0.125	1.018	PVC
964	P-497	J-281	PRV-5	2.00	400	120.00	72.74	0.58	0.002	1.005	PVC
965	P-500	J-433	J-427	244.00	200	110.00	-7.66	0.24	0.132	0.542	Asbestos Cement
966	P-501	J-40	J-433	147.00	300	110.00	-4.48	0.06	0.004	0.028	Asbestos Cement
967	P-502	J-225	J-317	106.00	300	120.00	0.00	0	0	0	PVC
968	P-529	J-461	J-542	318.00	300	120.00	10.31	0.15	0.014	0.111	PVC
971	P-536	J-202	J-183	115.00	350	120.00	7.58	0.08	0.005	0.03	PVC
972	P-597	J-232	J-455	163.00	200	120.00	0.03	0	0	0	PVC
973	P-598	J-137	J-456	53.00	200	120.00	-0.91	0.03	0	0.008	PVC
974	P-599	J-456	J-457	147.00	200	120.00	1.52	0.05	0.003	0.023	PVC
975	P-600	J-457	J-458	105.00	200	120.00	0.03	0	0	0	PVC
976	P-601	J-458	J-459	75.00	200	120.00	0.00	0	0	0	PVC
977	P-602	J-457	J-460	112.00	200	120.00	0.05	0	0	0	PVC
978	P-603	J-457	J-462	99.00	200	120.00	1.38	0.04	0.002	0.019	PVC
979	P-604	J-462	J-473	83.00	200	120.00	1.36	0.04	0.002	0.018	PVC
982	P-607	J-263	J-261	199.00	300	120.00	6.92	0.1	0.012	0.053	PVC
983	P-608	J-263	J-474	104.00	300	120.00	0.00	0	0	0	PVC
984	P-609	J-155	J-475	48.00	200	120.00	0.21	0.01	0	0.004	PVC
985	P-610	J-475	J-476	99.00	200	120.00	0.21	0.01	0	0	PVC
986	P-611	J-476	J-477	118.00	200	120.00	0.21	0.01	0	0.001	PVC
987	P-612	J-477	J-478	106.00	200	120.00	0.07	0	0	0	PVC
988	P-613	J-478	J-479	100.00	200	120.00	0.06	0	0	0	PVC
989	P-614	J-479	J-480	106.00	200	120.00	0.06	0	0	0	PVC
990	P-615	J-478	Country Squire	134.00	200	120.00	0.01	0	0	0	PVC
991	P-616	Country Squire	J-482	51.00	200	120.00	0.00	0	0	0	PVC
992	P-617	J-483	J-88	77.00	200	120.00	0.00	0	0	0	PVC
993	P-618	J-255	J-484	74.00	300	120.00	0.43	0.01	0	0.001	PVC
994	P-619	J-484	J-485	90.00	300	120.00	0.43	0.01	0	0	PVC
995	P-620	J-485	Greenbriar	149.00	300	120.00	0.39	0.01	0	0	PVC
996	P-621	Greenbriar	J-487	95.00	300	120.00	0.25	0	0	0.001	PVC
997	P-622	J-487	J-488	146.00	300	120.00	0.20	0	0	0	PVC
998	P-623	J-488	J-489	137.00	300	120.00	0.20	0	0	0	PVC
999	P-624	J-489	J-490	161.00	300	120.00	0.17	0	0	0	PVC
1000	P-625	J-490	J-491	59.00	300	120.00	0.17	0	0	0	PVC
1001	P-626	J-472	J-492	200.00	300	120.00	0.71	0.01	0	0	PVC
1003	P-628	J-493	J-494	221.00	300	120.00	0.65	0.01	0	0.001	PVC
1004	P-631	J-496	J-701	290.00	300	120.00	0.65	0.01	0	0.001	PVC
1006	P-633	J-494	J-496	395.00	300	120.00	0.65	0.01	0	0	PVC
1007	P-634	J-256	J-499	159.00	200	120.00	0.12	0	0	0	HDPE
1008	P-635	J-125	J-500	208.00	200	120.00	-1.40	0.04	0.004	0.02	PVC
1009	P-636	J-500	J-193	123.00	200	120.00	-1.50	0.05	0.003	0.022	PVC
1012	P-639	J-75	J-502	104.00	200	120.00	0.43	0.01	0	0.002	PVC
1013	P-640	J-502	J-503	95.00	200	120.00	0.36	0.01	0	0.002	PVC
1014	P-641	J-503	J-504	118.00	200	120.00	0.26	0.01	0	0.001	PVC
1015	P-642	J-504	J-505	103.00	200	120.00	0.16	0.01	0	0.001	PVC
1016	P-643	J-75	J-506	84.00	200	120.00	0.22	0.01	0	0.001	PVC
1017	P-644	J-506	J-507	147.00	200	120.00	0.12	0	0	0	PVC
1018	P-533	J-426	J-433	198.00	200	110.00	-3.14	0.1	0.021	0.103	Asbestos Cement
1021	P-439	J-513	J-167	152.00	300	120.00	-10.89	0.15	0.015	0.123	HDPE
1023	P-441	J-148	J-338	252.00	200	120.00	2.39	0.08	0.013	0.053	PVC
1024	P-443	J-339	J-232	126.00	200	120.00	0.97	0.03	0.001	0.01	PVC
1025	P-445	J-340	J-341	74.00	200	120.00	0.00	0	0	0	PVC
1026	P-446	J-338	J-342	79.00	200	120.00	2.39	0.08	0.004	0.054	PVC
1027	P-447	J-342	J-340	138.00	200	120.00	1.73	0.06	0.004	0.03	PVC
1028	P-448	J-342	J-343	127.00	200	120.00	0.66	0.02	0.001	0.005	PVC
1029	P-449	J-343	J-344	109.00	200	120.00	0.17	0.01	0	0	PVC
1030	P-450	J-344	J-345	88.00	200	120.00	0.17	0.01	0	0.001	PVC
1031	P-451	J-345	J-346	107.00	200	120.00	0.00	0	0	0	PVC
1032	P-452	J-255	J-347	531.00	300	120.00	0.34	0	0	0	PVC
1034	P-454	J-347	J-348	255.00	200	120.00	0.27	0.01	0	0.001	PVC
1036	P-456	J-349	J-350	241.00	250	120.00	-0.17	0	0	0	PVC
1037	P-457	J-350	J-351	254.00	250	120.00	-0.17	0	0	0	PVC
1038	P-458	J-351	J-352	307.00	250	120.00	-0.17	0	0	0	PVC
1039	P-459	J-352	J-353	190.00	250	120.00	-0.17	0	0	0.001	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1040	P-460	J-353	J-491	195.00	250	120.00	-0.17	0	0	0	PVC
1057	P-499	J-511	J-372	586.00	250	120.00	-2.16	0.04	0.003	0.015	PVC
1058	P-504	J-176	J-373	101.00	200	120.00	-1.00	0.03	0.001	0.011	PVC
1059	P-505	J-373	J-374	144.00	200	120.00	-1.00	0.03	0.001	0.01	PVC
1060	P-506	J-374	J-375	147.00	200	120.00	-1.00	0.03	0.002	0.011	PVC
1061	P-507	J-375	J-164	158.00	200	120.00	-1.00	0.03	0.002	0.011	PVC
1069	P-517	J-473	J-104	80.00	200	120.00	1.36	0.04	0.001	0.019	PVC
1103	P-573	J-424	J-425	398.00	300	120.00	10.61	0.15	0.03	0.117	PVC
1107	P-577	J-206	J-224	304.00	322	120.00	9.78	0.12	0.023	0.071	HDPE
1118	P-590	J-340	J-437	148.00	200	120.00	1.36	0.04	0.003	0.019	PVC
1119	P-591	J-437	J-339	102.00	200	120.00	1.12	0.04	0.001	0.013	PVC
1143	P-678	J-511	J-510	93.00	250	120.00	2.16	0.04	0.005	0.015	PVC
1158	P-693	J-169	J-388	745.00	300	120.00	-3.09	0.04	0.006	0.012	PVC
1162	P-697	J-446	PMP-2	2.00	350	120.00	0.00	0	0	0	PVC
1163	P-698	PMP-2	J-447	2.00	350	120.00	0.00	0	0	0	PVC
1169	P-705	J-449	J-208	166.00	300	120.00	-7.32	0.1	0.008	0.059	PVC
1171	P-707	Supreme Steel	J-450	178.00	410	120.00	-2.01	0.02	0	0.001	HDPE
1172	P-708	J-450	J-1	334.00	400	120.00	-2.01	0.02	0	0.001	PVC
1174	P-710	J-343	J-452	68.00	200	120.00	0.26	0.01	0	0.001	PVC
1175	P-711	J-437	J-453	67.00	200	120.00	0.24	0.01	0	0	PVC
1186	P-723	J-418	J-495	222.00	600	120.00	18.76	0.07	0.003	0.012	PVC
1190	P-727	J-514	J-417	673.00	300	120.00	-5.31	0.08	0.012	0.032	PVC
1203	P-735	J-449	J-515	810.00	250	120.00	2.84	0.06	0.008	0.025	PVC
1206	P-737	J-425	J-516	666.00	300	120.00	10.61	0.15	0.02	0.117	PVC
1211	P-740	J-424	J-518	0.00	300	120.00	0.00	0	0	0	PVC
1213	P-741	J-390	J-519	897.00	400	120.00	0.00	0	0	0	PVC
1216	P-743	J-373	J-520	0.00	200	120.00	0.00	0	0	0	PVC
1218	P-744	J-348	J-521	448.00	200	120.00	-0.05	0	0	0	PVC
1219	P-745	J-521	J-349	448.00	200	120.00	-0.05	0	0	0	PVC
1222	P-746	J-521	J-523	0.00	200	120.00	0.00	0	0	0	PVC
1224	P-747	J-349	J-524	0.00	250	120.00	0.00	0	0	0	PVC
1226	P-748	J-351	J-525	0.00	200	120.00	0.00	0	0	0	PVC
1248	P-754	J-495	J-529	560.00	250	120.00	1.70	0.03	0.001	0.009	PVC
1251	P-756	J-529	J-530	0.00	250	120.00	1.70	0.03	0.001	0.01	PVC
1253	P-757	J-530	J-531	0.00	250	120.00	1.70	0.03	0.002	0.01	PVC
1255	P-758	J-531	J-532	0.00	250	120.00	1.70	0.03	0.001	0.01	PVC
1256	P-759	J-532	J-390	0.00	250	120.00	1.70	0.03	0.002	0.01	PVC
1257	P-760	J-390	J-495	0.00	600	120.00	-17.06	0.06	0.006	0.01	PVC
1262	P-762	PRV-A	J-535	185.00	300	120.00	10.31	0.15	0.008	0.111	PVC
1263	P-763	J-535	Panattoni	185.00	300	120.00	10.31	0.15	0.02	0.111	PVC
1280	P-773	J-542	PRV-A	0.00	300	120.00	10.31	0.15	0.011	0.111	PVC
1304	P-789	J-1	J-550	0.00	350	120.00	0.32	0	0	0	PVC
1309	P-792	J-82	J-552	0.00	200	120.00	0.02	0	0	0	PVC
1311	P-793	J-345	J-553	288.00	200	120.00	0.00	0	0	0	PVC
1314	P-795	J-197	J-554	247.00	300	120.00	-0.96	0.01	0	0.001	PVC
1315	P-796	J-554	J-200	247.00	300	120.00	-0.74	0.01	0	0	PVC
1316	P-797	J-261	J-554	0.00	200	120.00	0.22	0.01	0	0.001	PVC
1318	P-798	J-261	J-555	401.00	300	120.00	2.14	0.03	0.001	0.006	PVC
1319	P-799	J-555	J-196	401.00	300	120.00	0.07	0	0	0	PVC
1324	P-801	J-555	J-558	0.00	200	120.00	0.00	0	0	0	PVC
1325	P-802	J-558	J-556	0.00	200	120.00	0.00	0	0	0	PVC
1326	P-803	J-557	J-558	0.00	200	120.00	0.00	0	0	0	PVC
1331	P-806	J-168	J-560	1,219.00	350	120.00	0.44	0	0	0	PVC
1334	P-808	J-246	J-561	359.00	322	120.00	-69.41	0.85	0.492	2.685	HDPE
1335	P-809	J-561	J-278	359.00	300	120.00	-69.41	0.98	0.65	3.79	PVC
1337	P-810	J-277	J-562	362.00	300	120.00	4.42	0.06	0.005	0.023	PVC
1338	P-811	J-562	J-451	362.00	300	120.00	4.37	0.06	0.003	0.023	PVC
1340	P-812	J-451	J-563	0.00	300	120.00	4.08	0.06	0.006	0.02	PVC
1343	P-814	J-563	J-564	0.00	300	120.00	3.09	0.04	0.004	0.012	PVC
1344	P-815	J-564	J-167	0	300	120	3.09	0.04	0.002	0.012	PVC
1346	P-816	J-275	J-565	618	300	120	2.98	0.04	0.003	0.011	PVC
1347	P-817	J-565	J-180 (Dummy)	618	300	120	2.13	0.03	0.002	0.006	PVC
1349	P-818	J-275	J-566	785	300	120	2.31	0.03	0.001	0.007	PVC
1350	P-819	J-614	J-388	785	300	120	3.09	0.04	0.008	0.012	PVC
1352	P-820	J-566	J-567	0	300	120	0.05	0	0	0	PVC
1354	P-821	J-262	J-568	797	300	120	-3.7	0.05	0.008	0.016	PVC
1355	P-822	J-568	J-449	797	300	120	-3.7	0.05	0.006	0.017	PVC
1357	P-823	Panattoni	J-569	726	300	120	9.79	0.14	0.008	0.101	PVC
1361	P-826	J-570	J-464	726	300	120	9.79	0.14	0.023	0.101	PVC
1364	P-828	J-571	J-570	726	300	120	9.79	0.14	0.01	0.101	PVC
1368	P-830	J-573	Supreme Steel	1,001	400	120	-2.01	0.02	0	0.001	PVC
1374	P-834	J-575	J-369	589	300	120	-4.76	0.07	0.004	0.026	PVC
1376	P-835	J-424	J-576	899	400	120	7.74	0.06	0.004	0.016	PVC
1388	P-838	J-569	J-578	726	300	120	9.79	0.14	0.026	0.101	PVC
1389	P-839	J-578	J-571	726	300	120	9.79	0.14	0.007	0.1	PVC
1391	P-840	J-497	J-579	41	300	120	0	0	0	0	PVC
1392	P-841	J-579	J-498	41	300	120	0	0	0	0	PVC
1406	P-848	J-576	J-586	899	400	120	6.07	0.05	0.003	0.01	PVC
1453	P-873	J-347	J-602	818	300	120	0.07	0	0	0	PVC
1454	P-874	J-602	J-252	818	300	120	0.07	0	0	0	PVC
1474	P-884	J-481	J-607	0	300	120	0	0	0	0	PVC
1476	P-885	J-508	J-608	503	300	120	-1.39	0.02	0	0.003	PVC
1479	P-887	J-608	J-609	0	300	120	0	0	0	0	PVC
1481	P-888	J-391 (Dummy)	J-610	624	400	120	3.44	0.03	0.001	0.004	PVC
1482	P-889	J-610	J-508	624	300	120	2.73	0.04	0.002	0.009	PVC
1484	P-890	J-415	J-611	176	300	120	-0.24	0	0	0	PVC
1485	P-891	J-611	J-9	176	300	120	-0.24	0	0	0	PVC
1491	P-895	J-432	J-447	0	350	120	0	0	0	0	PVC
1493	P-896	J-446	CV-2	1	350	120	0	0	0	0	PVC
1494	P-897	CV-2	J-281	1	350	120	0	0	0	0	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1505	P-904	J-565	J-614	0	300	120	0.85	0.01	0	0.001	PVC
1506	P-905	J-614	J-566	0	300	120	-2.24	0.03	0.002	0.007	PVC
1560	P-933	J-508	J-629	1,206	400	120	8.87	0.07	0.009	0.021	PVC
1561	P-934	J-629	J-628	1,206	400	120	8.87	0.07	0.008	0.021	PVC
1620	P-954	J-628	J-634	906	400	120	8.87	0.07	0.003	0.02	PVC
1682	P-967	J-516	J-642	666	400	120	10.61	0.08	0.003	0.028	PVC
1683	P-968	J-642	J-393	666	400	120	10.61	0.08	0.002	0.03	PVC
1743	P-540(2)	J-647	J-393	848	400	120	6.28	0.05	0.004	0.011	PVC
1745	P-974	J-647	J-648 (Dummy)	0	300	120	0.65	0.01	0	0.001	PVC
1747	P-975	J-648 (Dummy)	J-649	0	300	120	-1.89	0.03	0.001	0.005	PVC
1749	P-540(1)(1)	J-392	J-650	848	400	120	8.82	0.07	0.006	0.021	PVC
1750	P-540(1)(2)	J-650	J-647	848	400	120	6.93	0.06	0.002	0.013	PVC
1751	P-976	J-649	J-650	0	300	120	-1.89	0.03	0.002	0.005	PVC
1794	P-691(1)	J-166	J-651	105	350	120	-10.89	0.11	0.006	0.058	PVC
1795	P-691(2)	J-651	PRV-2i	1	76	120	-10.89	2.4	0.099	98.599	PVC
1797	P-438(1)	PRV-2i	J-652	1	76	120	-10.89	2.4	0.099	98.599	PVC
1798	P-438(2)	J-652	J-513	118	350	120	-10.89	0.11	0.007	0.057	PVC
1807	P-531(1)	J-207	J-653	39	300	120	-20.25	0.29	0.015	0.387	PVC
1808	P-531(2)	J-653	PRV-Bi	1	100	120	-20.25	2.58	0.082	81.632	PVC
1810	P-532(1)	PRV-Bi	J-654	1	100	120	-20.25	2.58	0.082	81.632	PVC
1811	P-532(2)	J-654	J-210	144	300	120	-20.25	0.29	0.056	0.387	PVC
1816	P-246(1)	J-190	J-655	43	300	120	-4.36	0.06	0.001	0.022	PVC
1817	P-246(2)	J-655	PRV-1i	1	76	120	-4.36	0.96	0.018	18.083	PVC
1819	P-247(1)	PRV-1i	J-656	1	76	120	-4.36	0.96	0.018	18.083	PVC
1820	P-247(2)	J-656	J-191	166	265	120	-4.36	0.08	0.007	0.041	HDPE
1825	P-605(1)	J-456	J-657	123	200	120	-2.43	0.08	0.007	0.055	PVC
1826	P-605(2)	J-657	PRV-21i	1	76	120	-2.43	0.53	0.006	6.102	PVC
1828	P-606(1)	PRV-21i	J-658	1	76	120	-2.43	0.53	0.006	6.102	PVC
1829	P-606(2)	J-658	J-140	37	200	120	-2.43	0.08	0.002	0.056	PVC
1834	P-131(1)	J-124	J-659	15	200	120	-1.08	0.03	0	0.01	PVC
1835	P-131(2)	J-659	PRV-3i	1	50	120	-1.08	0.55	0.011	10.567	PVC
1837	P-132(1)	PRV-3i	J-660	1	50	120	-1.08	0.55	0.01	10.492	PVC
1838	P-132(2)	J-660	J-126	64	200	120	-1.08	0.03	0.001	0.013	PVC
1858	P-989	J-83	J-662	0	200	120	0	0	0	0	PVC
1860	P-990	J-85	J-663	0	200	120	0	0	0	0	PVC
1861	P-991	J-277	J-181	0	300	120	-0.45	0.01	0	0	PVC
1883	P-854(1)	J-589	J-666	120	250	120	-2.16	0.04	0.002	0.015	PVC
1884	P-854(2)	J-666	PRV-19i	1	76.2	120	-2.16	0.47	0.005	4.837	PVC
1886	P-680(1)	PRV-19i	J-667	1	76.2	120	-2.16	0.47	0.005	4.837	PVC
1887	P-680(2)	J-667	J-165	61	250	120	-2.16	0.04	0.001	0.016	PVC
1931	P-790(1)	J-550	J-668	0	350	120	0.32	0	0	0	PVC
1932	P-790(2)	J-668	J-454	0	350	120	0.32	0	0	0	PVC
1950	P-831(1)	J-481	J-675	1,001	400	120	-1.82	0.01	0	0.001	PVC
1951	P-831(2)	J-675	J-574	1,001	400	120	-1.82	0.01	0	0.001	PVC
1953	P-886(1)	J-608	J-676	503	400	120	-1.39	0.01	0	0	PVC
1954	P-886(2)	J-676	J-481	503	400	120	-1.39	0.01	0	0	PVC
1966	P-490(1)	J-253	J-682	280	200	120	0	0	0	0	PVC
1967	P-490(2)	J-682	J-371	280	200	120	0	0	0	0	PVC
1975	P-627(1)	J-492	J-685	233	300	120	0.65	0.01	0	0.001	PVC
1976	P-627(2)	J-685	J-493	233	300	120	0.65	0.01	0	0	PVC
1981	P-833(1)	J-508	J-687	589	300	120	-4.76	0.07	0.006	0.026	PVC
1982	P-833(2)	J-687	J-575	589	300	120	-4.76	0.07	0.005	0.027	PVC
1984	P-725(1)	J-9	J-688	642	300	120	-5.14	0.07	0.007	0.031	PVC
1985	P-725(2)	J-688	J-514	642	300	120	-5.14	0.07	0.014	0.031	PVC
1987	P-849(1)	J-586	J-689	899	400	120	5.98	0.05	0.001	0.01	PVC
1988	P-849(2)	J-689	J-391 (Dummy)	899	400	120	5.98	0.05	0.002	0.01	PVC
1990	P-428(1)	J-81	J-690	1,571	250	120	-2.16	0.04	0.004	0.015	PVC
1991	P-428(2)	J-690	J-510	1,571	250	120	-2.16	0.04	0.005	0.015	PVC
1993	P-853(1)	J-372	J-691	581	250	120	-2.16	0.04	0.003	0.015	PVC
1994	P-853(2)	J-691	J-589	581	250	120	-2.16	0.04	0.003	0.015	PVC
1996	P-286(1)	J-256	J-692	219	200	120	-0.22	0.01	0	0	HDPE
1997	P-286(2)	J-692	J-257	219	200	120	-0.22	0.01	0	0.001	HDPE
1999	P-76(1)	J-71	J-693	166	200	120	0.11	0	0	0	PVC
2000	P-76(2)	J-693	J-72	166	200	120	0.11	0	0	0.001	PVC
2003	P-988(2)	J-694	J-200	0	200	120	2.67	0.08	0.014	0.065	PVC
2005	P-988(1)(1)	J-515	J-695	0	200	120	2.67	0.08	0.01	0.065	PVC
2006	P-988(1)(2)	J-695	J-694	0	200	120	2.67	0.08	0.013	0.066	PVC
2010	P-956(1)	J-392	J-697	0	400	120	-8.87	0.07	0.005	0.021	PVC
2011	P-956(2)	J-697	J-634	0	400	120	-8.87	0.07	0.005	0.021	PVC
2013	P-832(1)	J-574	J-698	1,001	400	120	-1.82	0.01	0	0.001	PVC
2014	P-832(2)	J-698	J-573	1,001	400	120	-1.82	0.01	0	0.001	PVC
2016	P-571(1)	J-390	J-699	201	400	120	18.44	0.15	0.017	0.08	PVC
2017	P-571(2)	J-699	J-424	201	400	120	18.44	0.15	0.013	0.08	PVC
2026	P-948(2)	J-701	J-497	0	300	120	0.65	0.01	0	0.001	PVC
2049	P-900(1)	J-560	J-709	1,219	350	120	0	0	0	0	PVC
2050	P-900(2)	J-709	J-613	1,219	350	120	0	0	0	0	PVC
2146	P-687(1)(1)	J-393	J-720	807	400	120	0	0	0	0	PVC
2147	P-687(1)(2)	J-720	J-719	807	360	130	0	0	0	0	HDPE
2149	P-1029	J-111	J-721	0	200	120	0	0	0	0	PVC
2150	P-1030	J-168	J-167	0	350	120	4.64	0.05	0.005	0.012	PVC
2154	P-1032	J-555	J-723	0	300	120	2.07	0.03	0.001	0.006	PVC
2156	P-1033	J-723	J-724	0	300	120	2.07	0.03	0.001	0.005	PVC
2158	P-1034	J-724	J-725	0	300	120	2.07	0.03	0.001	0.006	PVC
2159	P-1035	J-725	J-192	0	300	120	2.07	0.03	0.002	0.006	PVC

AECOM

Appendix E

Near Future System Simulation Results

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
185	J-160	584,027.01	5,934,838.88	678.02	0	79.40	733.96
186	J-222	582,145.56	5,932,813.74	700.26	0	63.50	744.99
187	J-162	583,810.38	5,934,670.57	685.00	0	69.50	733.96
188	J-138	584,613.67	5,935,181.42	678.38	0	78.90	733.95
189	J-192	581,191.96	5,933,912.97	677.56	0	95.70	744.99
190	J-119	584,936.53	5,935,869.14	667.10	0	70.90	717.01
191	J-134	584,764.89	5,935,072.26	680.51	0.03	75.90	733.96
192	J-67	581,650.04	5,931,561.40	710.00	0	77.20	764.38
193	J-38	581,243.76	5,931,279.09	710.00	0.01	77.10	764.34
194	J-41	581,141.03	5,931,480.63	710.00	0.01	77.10	764.34
195	J-144	584,396.66	5,935,219.39	675.00	0	83.70	733.95
196	J-37	581,243.76	5,931,168.95	710.00	0	77.10	764.34
197	J-472	580,740.47	5,933,183.14	689.91	0	78.20	744.99
198	J-201	581,815.00	5,933,229.15	690.13	0	77.90	744.99
199	J-91	582,694.12	5,935,128.13	660.00	0	79.80	716.20
200	J-103	585,091.20	5,936,277.99	665.00	0.03	73.80	717.01
201	J-53	581,438.28	5,930,980.15	710.00	0.03	77.10	764.34
202	J-40	581,233.98	5,931,482.32	710.00	0	77.10	764.34
203	J-107	584,778.23	5,935,996.97	664.16	0	75.00	717.01
204	J-212	581,825.45	5,932,053.99	710.00	0	77.20	764.42
205	J-197	581,603.91	5,933,472.82	685.44	0	84.50	744.99
206	J-159	584,150.38	5,934,848.85	679.15	0	77.80	733.96
207	J-163	583,696.80	5,934,580.94	685.00	0	69.50	733.96
208	J-92	582,355.13	5,935,027.71	660.00	0.02	79.80	716.20
209	J-90	582,616.55	5,935,084.61	660.00	0.05	79.80	716.20
210	J-111	585,098.38	5,935,794.30	672.05	0.05	63.80	717.01
211	J-177	583,865.02	5,934,178.46	693.29	0	57.70	733.96
212	J-471	580,745.35	5,933,130.74	690.00	0	78.10	745.00
213	J-233	584,681.75	5,934,979.21	681.75	0.04	74.10	733.96
214	68 (Dum	580,952.95	5,932,747.92	698.59	0.68	65.90	745.00
215	J-1	579,511.27	5,931,168.86	705.00	0.18	84.20	764.31
216	J-174	583,865.88	5,934,330.48	690.60	0.04	61.60	733.96
218	J-131	584,433.28	5,934,995.60	679.54	0.04	77.20	733.96
219	J-100	584,835.40	5,936,162.83	665.00	0.05	73.80	717.01
220	J-75	581,067.83	5,934,963.64	655.66	0	85.90	716.20
221	J-60	581,268.02	5,931,483.28	710.00	0	77.10	764.34
222	J-217	581,836.74	5,931,627.98	710.00	0	77.20	764.42
223	J-146	584,443.42	5,934,865.47	686.39	0	67.50	733.96
224	J-6	579,945.01	5,931,013.88	708.42	0.01	79.30	764.32
225	J-169	583,532.49	5,933,358.14	702.50	0	60.30	744.99
226	J-4	579,847.42	5,931,278.15	705.69	0	83.20	764.31
227	J-27	580,669.54	5,930,951.45	710.00	0.03	77.10	764.32
228	J-158	584,415.79	5,934,856.33	685.70	0	68.50	733.96
229	J-14	580,335.90	5,931,383.96	710.00	0	77.10	764.31
230	J-105	584,480.67	5,935,747.97	663.83	0.05	75.50	717.01
231	J-261	581,205.35	5,933,531.77	685.10	0	85.00	744.99
232	J-51	581,311.65	5,930,974.43	710.00	0.06	77.10	764.34
233	J-183	582,114.01	5,933,238.15	690.57	0	77.30	744.99

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
234	J-106	584,742.82	5,936,007.34	663.04	0.03	76.60	717.01
235	J-244	581,247.28	5,930,944.87	712.82	0	73.10	764.33
236	J-185	582,109.89	5,933,372.58	689.49	0.12	78.80	744.99
237	J-205	581,855.89	5,932,883.46	697.62	0	67.20	744.99
238	J-88	582,477.45	5,934,962.82	661.52	0.05	77.60	716.20
239	J-87	582,416.94	5,934,900.96	661.92	0	77.00	716.20
240	J-104	584,294.78	5,935,708.60	663.84	0.05	75.50	717.01
241	J-246	581,897.49	5,931,628.85	710.00	0	77.30	764.44
242	J-232	584,892.94	5,934,920.80	684.28	0	70.50	733.96
243	J-30	580,902.68	5,930,954.31	710.00	0.02	77.10	764.33
244	J-9	580,323.88	5,930,706.90	710.00	0.01	77.10	764.32
245	J-182	582,375.00	5,933,263.31	692.23	0.04	74.90	744.99
246	J-203	581,820.84	5,933,082.06	694.39	0.07	71.80	744.99
247	J-65	581,778.70	5,931,509.37	710.00	0	77.20	764.39
248	J-113	584,707.09	5,935,813.70	666.13	0	72.20	717.01
249	J-126	584,863.23	5,935,234.31	677.59	0.05	80.00	733.96
251	J-175	583,860.04	5,934,212.11	692.89	0.02	58.30	733.96
252	J-108	584,859.07	5,935,946.29	665.31	0.01	73.40	717.01
253	J-152	584,376.31	5,934,716.20	687.39	0.04	66.10	733.96
254	J-200	581,603.76	5,933,231.65	690.97	0	76.70	744.99
255	J-36	581,245.19	5,931,074.55	710.09	0	77.00	764.33
256	J-143	584,418.36	5,935,234.31	675.12	0	83.50	733.95
257	J-81	581,858.80	5,934,643.74	665.00	0	72.70	716.20
258	J-12	580,220.70	5,931,351.93	710.00	0	77.10	764.31
259	J-226	582,264.78	5,932,630.99	705.95	0.02	55.40	744.99
260	J-45	580,893.42	5,931,477.97	710.00	0.02	77.10	764.33
261	J-17	580,311.95	5,931,197.47	710.00	0	77.10	764.31
262	J-206	581,857.12	5,932,625.05	705.00	0	56.80	745.00
263	J-115	584,825.79	5,935,796.19	666.72	0.02	71.40	717.01
264	J-150	584,403.44	5,934,788.09	687.49	0	66.00	733.96
265	J-77	581,167.95	5,934,784.85	659.73	0	80.20	716.20
266	J-18	580,314.80	5,931,075.86	708.85	0	78.70	764.32
267	J-141	584,418.36	5,935,257.37	675.00	0	83.70	733.95
268	J-8	580,315.10	5,931,044.42	708.00	0.03	79.90	764.32
270	J-118	585,014.92	5,935,991.35	667.08	0.05	70.90	717.01
271	J-34	581,184.46	5,930,958.60	713.60	0	72.00	764.33
272	J-263	580,990.65	5,933,540.47	686.38	0	83.20	744.99
273	J-135	584,890.35	5,935,064.77	680.00	0.06	76.60	733.96
274	J-121	584,820.49	5,935,506.24	675.00	0.01	59.60	717.01
275	J-181	582,540.59	5,933,275.94	693.31	0.01	73.40	744.99
276	J-264	581,189.28	5,933,693.30	681.63	0.61	89.90	744.99
277	J-220	582,117.40	5,932,983.49	695.93	0.08	69.60	744.99
278	J-252	578,937.82	5,934,828.30	660.00	0.01	79.80	716.19
279	J-142	584,423.78	5,935,296.70	675.00	0	83.70	733.95
280	J-109	584,921.74	5,935,884.21	666.76	0.03	71.30	717.01
281	J-129	584,501.09	5,935,261.44	676.15	0.05	82.00	733.95
282	J-39	581,239.51	5,931,322.53	710.00	0	77.10	764.34
283	J-164	583,606.03	5,934,540.88	685.74	0	68.50	733.97

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
285	J-219	582,113.42	5,933,083.07	693.64	0.03	72.90	744.99
286	J-469	580,912.58	5,932,829.94	695.69	0	70.00	745.00
287	J-256	580,441.19	5,935,464.19	655.00	0.03	86.90	716.19
288	J-120	584,734.38	5,935,692.75	670.15	0	66.50	717.01
289	J-230	581,106.83	5,932,460.94	706.93	0	54.00	745.00
290	J-130	584,431.22	5,935,093.29	677.58	0.03	80.00	733.96
291	J-117	585,014.92	5,936,121.64	665.00	0.03	73.80	717.01
292	J-223	582,152.61	5,932,731.90	702.98	0	59.60	744.99
293	J-218	581,867.74	5,931,628.35	710.00	0	77.30	764.43
294	J-46	580,798.60	5,931,476.05	710.00	0	77.10	764.33
295	J-2	579,680.28	5,931,170.16	705.50	0.11	83.50	764.31
296	J-26	580,564.63	5,931,456.51	710.00	0.01	77.10	764.32
297	J-189	581,084.12	5,934,453.39	665.00	0.04	72.70	716.20
298	J-211	581,876.01	5,932,068.33	710.09	0	77.10	764.42
299	J-23	580,668.11	5,931,070.17	710.00	0.01	77.10	764.32
301	J-59	581,386.82	5,931,485.18	710.00	0.61	77.20	764.35
302	J-156	584,404.53	5,934,722.07	688.13	0	65.00	733.96
303	J-199	581,769.17	5,933,510.82	685.00	0.01	85.20	744.99
305	J-148	584,454.98	5,934,760.96	689.42	0.01	63.20	733.96
306	J-132	584,558.06	5,935,001.03	680.87	0.02	75.40	733.96
307	J-19	580,403.49	5,931,080.18	707.98	0	80.00	764.32
308	J-83	581,967.59	5,934,879.14	661.00	0	78.40	716.20
309	J-139	584,644.86	5,935,312.98	676.87	0.03	81.00	733.95
310	J-133	584,653.03	5,935,049.18	680.00	0.02	76.60	733.96
311	J-96	584,368.02	5,935,856.50	660.02	0.03	80.90	717.01
312	J-204	581,850.05	5,933,080.11	694.67	0	71.40	744.99
313	J-52	581,362.87	5,930,976.72	710.00	0	77.10	764.34
314	J-55	581,524.10	5,931,157.51	710.00	0.03	77.20	764.36
315	J-74	580,931.94	5,934,929.32	656.10	0	85.30	716.20
316	J-253	578,957.63	5,934,474.88	660.00	0.01	79.80	716.19
317	J-225	582,168.53	5,932,538.56	707.11	0	53.80	744.99
318	J-186	582,113.31	5,933,524.29	685.00	0	85.20	744.99
319	J-66	581,776.04	5,931,621.09	710.00	0	77.20	764.40
320	J-227	582,440.48	5,932,638.63	706.71	0.54	54.30	744.99
321	J-54	581,528.40	5,930,990.16	710.00	0	77.10	764.35
322	J-470	580,815.61	5,933,005.16	692.36	0	74.70	745.00
323	J-165	583,521.11	5,934,524.87	687.40	0	66.10	733.97
324	J-32	581,064.31	5,930,954.31	710.00	0.03	77.10	764.33
325	J-42	581,092.22	5,931,480.07	710.00	0.02	77.10	764.34
326	J-178	583,196.31	5,933,356.52	696.11	0.06	69.40	744.99
327	J-93	584,191.17	5,935,768.07	660.00	0.05	80.90	717.01
328	J-97	584,487.83	5,935,930.76	660.00	0.03	80.90	717.01
329	J-122	584,821.83	5,935,460.16	675.00	0.02	59.60	717.01
330	J-84	582,052.57	5,934,877.70	660.32	0.01	79.30	716.20
331	J-62	581,787.29	5,931,163.23	710.00	0	77.20	764.38
332	J-29	580,819.72	5,930,954.31	710.00	0.01	77.10	764.33
333	J-94	584,255.00	5,935,803.19	660.00	0	80.90	717.01
334	J-72	580,939.25	5,935,281.52	655.00	0.03	86.90	716.20

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
335	J-188	582,266.79	5,933,527.86	686.55	0	83.00	744.99
336	J-231	580,791.64	5,934,829.71	658.98	0	81.20	716.20
337	J-229	581,106.36	5,932,407.45	708.32	0.01	52.10	745.00
338	J-466	580,911.13	5,932,595.87	700.92	0	62.60	745.00
339	J-10	579,940.63	5,931,347.65	705.00	0.06	84.20	764.31
340	J-95	584,308.01	5,935,828.08	660.00	0.01	80.90	717.01
341	5 (Dumr	580,618.70	5,931,343.45	710.00	0.68	77.10	764.32
342	J-78	581,169.38	5,934,827.76	658.78	0	81.50	716.20
343	J-99	584,705.73	5,936,073.73	662.40	0.07	77.50	717.01
345	J-7	579,949.27	5,931,039.18	708.18	0	79.70	764.32
346	J-196	581,597.38	5,933,587.35	683.44	0.05	87.40	744.99
347	J-208	581,439.10	5,932,459.61	706.90	0.01	54.10	745.00
348	J-68	580,592.95	5,934,845.60	659.96	0.04	79.80	716.20
349	J-73	580,877.59	5,934,935.04	656.37	0.06	84.90	716.20
350	J-79	581,379.39	5,934,807.01	659.35	0	80.70	716.20
351	J-464	580,909.59	5,932,458.81	705.00	0	56.80	745.00
352	J-221	582,125.37	5,932,889.89	698.69	0	65.70	744.99
353	J-63	581,781.57	5,931,261.93	710.00	0.04	77.20	764.38
354	J-48	580,984.87	5,931,374.92	710.00	0	77.10	764.33
355	J-173	583,884.96	5,934,430.17	688.11	0.06	65.10	733.96
356	J-136	584,891.71	5,935,152.93	679.69	0	77.00	733.96
357	J-255	580,263.72	5,934,844.03	655.00	0.02	86.90	716.20
358	J-137	584,631.30	5,935,458.11	675.00	0.04	59.60	717.01
359	J-44	580,980.30	5,931,477.21	710.00	0	77.10	764.33
363	J-69	580,683.06	5,934,980.81	657.45	0.04	83.40	716.20
364	J-461	580,324.91	5,931,786.10	709.66	0.03	77.50	764.27
365	J-50	580,982.78	5,931,104.50	710.00	0	77.10	764.33
366	J-58	581,515.23	5,931,487.78	710.00	0.01	77.20	764.36
367	J-61	581,675.72	5,931,158.94	710.00	0.01	77.20	764.37
368	6 (Dumr	581,521.24	5,931,231.89	710.00	0.68	77.20	764.36
369	J-47	580,657.25	5,931,474.23	710.00	0.01	77.10	764.32
370	J-176	583,816.43	5,934,177.51	694.01	0.13	56.70	733.96
371	J-128	584,625.87	5,935,253.30	677.60	0.04	80.00	733.95
372	J-151	584,368.17	5,934,786.73	686.46	0.02	67.40	733.96
373	J-13	580,314.34	5,931,355.17	710.00	0.01	77.10	764.31
374	J-33	581,129.33	5,930,960.12	711.70	0	74.70	764.33
376	J-123	584,823.26	5,935,405.93	675.00	0	59.60	717.01
378	J-21	580,469.94	5,931,023.06	709.21	0.04	78.20	764.32
379	30 (Dum	582,732.45	5,933,277.32	694.69	0.68	71.40	744.99
380	J-202	581,938.04	5,933,230.80	691.08	0	76.50	744.99
381	J-168	583,530.88	5,933,486.18	696.64	0	68.60	744.99
382	J-49	580,979.92	5,931,250.39	710.00	0.04	77.10	764.33
383	J-110	584,991.94	5,935,799.82	669.94	0.04	66.80	717.01
384	J-102	585,009.28	5,936,277.18	663.86	0.03	75.50	717.01
385	J-31	580,988.50	5,930,955.74	710.00	0	77.10	764.33
386	J-147	584,453.45	5,934,840.49	687.96	0	65.30	733.96
387	J-28	580,746.77	5,930,951.45	710.00	0	77.10	764.32
388	J-24	580,662.38	5,931,227.51	710.00	0	77.10	764.32

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
389	J-465	580,908.44	5,932,502.26	705.00	0	56.80	745.00
390	J-154	584,411.58	5,934,645.67	688.86	0.03	64.00	733.96
391	J-89	582,495.94	5,935,018.15	660.81	0.02	78.60	716.20
392	J-153	584,372.24	5,934,648.39	687.96	0.03	65.30	733.96
394	J-98	584,633.48	5,936,025.02	660.29	0.03	80.50	717.01
395	J-259	580,335.37	5,931,450.69	710.00	0.12	77.10	764.30
396	J-3	579,802.82	5,931,225.65	706.10	0.09	82.60	764.31
397	J-85	582,115.29	5,934,881.39	660.25	0.38	79.40	716.20
398	J-71	580,907.63	5,935,126.70	655.00	0.03	86.90	716.20
399	J-116	585,011.03	5,936,214.00	665.00	0.03	73.80	717.01
400	J-167	583,523.26	5,933,883.17	694.49	0	71.70	744.99
401	J-70	580,800.35	5,935,056.62	655.00	0.03	86.90	716.20
402	J-43	581,021.33	5,931,478.00	710.00	0	77.10	764.33
403	J-179	582,955.94	5,933,296.73	695.00	0	71.00	744.99
406	J-224	582,174.13	5,932,629.80	705.00	0.08	56.80	744.99
407	J-35	581,249.48	5,930,968.71	712.31	0	73.80	764.33
408	J-145	584,444.72	5,934,995.00	679.73	0	77.00	733.96
409	J-170	583,875.75	5,934,103.79	694.22	0	56.40	733.96
410	J-228	582,556.63	5,932,642.20	708.46	0.05	51.90	744.99
411	J-15	580,429.24	5,931,386.27	710.00	0.06	77.10	764.31
412	eson Zo	581,783.00	5,931,386.36	710.00	0.08	77.20	764.39
413	J-262	580,997.23	5,933,183.46	691.01	0	76.60	744.99
414	J-76	581,080.70	5,934,784.85	659.39	0	80.60	716.20
415	J-82	581,851.29	5,934,868.21	661.29	0	77.90	716.20
416	J-187	582,195.09	5,933,525.99	685.61	0.02	84.30	744.99
417	J-124	584,883.57	5,935,380.79	675.00	0	59.60	717.01
418	J-86	582,250.40	5,934,884.38	660.62	0.02	78.90	716.20
419	J-101	584,926.98	5,936,225.99	665.00	0.04	73.80	717.01
420	J-140	584,498.38	5,935,323.83	675.17	0.02	83.40	733.95
422	J-198	581,719.60	5,933,471.45	685.00	0.22	85.20	744.99
423	J-248	581,903.32	5,932,070.50	710.80	0	76.10	764.42
424	J-247	581,891.92	5,931,996.23	710.54	0	76.50	764.42
426	J-5	579,945.61	5,931,212.07	706.57	0	82.00	764.31
427	J-171	583,770.32	5,934,494.96	687.57	0.03	65.90	733.96
428	J-22	580,670.19	5,931,024.49	710.00	0.01	77.10	764.32
429	J-16	580,476.44	5,931,406.30	710.00	0	77.10	764.32
430	J-184	582,112.89	5,933,307.91	690.00	0.03	78.10	744.99
431	J-57	581,518.38	5,931,364.91	710.00	0	77.20	764.36
432	J-11	580,115.27	5,931,356.66	710.00	0.07	77.10	764.31
433	J-467	580,945.04	5,932,670.20	698.68	0.12	65.70	745.00
434	J-127	584,738.45	5,935,230.24	678.28	0.03	79.00	733.96
435	J-20	580,457.07	5,931,080.27	710.00	0.01	77.10	764.32
436	J-172	583,827.64	5,934,460.07	688.49	0.03	64.50	733.96
437	J-157	584,429.91	5,934,843.88	686.75	0.01	67.00	733.96
438	J-161	583,932.31	5,934,795.27	682.13	0	73.60	733.96
439	J-114	584,722.31	5,935,766.42	668.89	0	68.30	717.01
440	J-149	584,407.51	5,934,758.25	688.05	0.02	65.20	733.96
441	akeshor	584,613.31	5,935,863.83	662.35	0.05	77.60	717.01

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
442	J-257	580,273.72	5,935,345.33	655.00	0.01	86.90	716.19
443	J-155	584,414.29	5,934,584.64	689.82	0.02	62.70	733.96
444	0 (Dumr	581,734.36	5,934,653.26	664.25	0.68	73.70	716.20
445	J-125	580,796.41	5,934,677.05	660.00	0.04	79.80	716.20
446	J-193	580,848.07	5,934,368.52	665.00	0.03	72.70	716.20
447	J-194	580,976.24	5,934,190.14	670.34	0.03	65.10	716.20
448	J-209	580,970.10	5,934,678.48	660.00	0.03	79.80	716.20
449	J-214	580,690.97	5,934,694.14	660.00	0	79.80	716.20
450	J-215	580,690.08	5,934,275.57	666.57	0	70.50	716.20
451	J-216	580,551.33	5,931,612.96	710.00	0	77.10	764.33
452	J-274	580,878.67	5,934,350.62	665.00	0	72.70	716.20
453	J-275	582,747.60	5,932,645.50	707.89	0.01	52.70	744.99
454	J-276	582,369.34	5,933,528.13	687.83	0.01	81.10	744.99
455	J-277	582,535.87	5,933,574.49	689.17	0.01	79.20	744.99
456	J-278	582,252.25	5,931,642.45	710.00	0	77.50	764.63
457	79 (Dum	582,429.55	5,931,644.90	712.34	0.68	74.40	764.74
458	J-280	582,657.75	5,931,650.26	715.00	0.21	70.80	764.89
460	J-317	582,199.34	5,932,409.79	709.00	0.68	51.10	744.99
461	preme S	579,529.45	5,930,618.12	710.00	0	77.10	764.31
462	J-369	580,329.98	5,930,530.83	711.57	0.02	74.90	764.32
463	J-413	584,962.80	5,935,893.67	667.76	0	69.90	717.01
464	J-414	580,992.55	5,933,333.24	690.00	0.01	78.10	744.99
465	J-415	580,322.26	5,930,836.93	709.65	0	77.60	764.32
466	J-416	580,996.56	5,933,257.52	690.00	0	78.10	744.99
467	J-417	581,409.37	5,930,749.49	710.00	0	77.10	764.33
468	J-418	581,473.62	5,930,748.31	710.00	0	77.10	764.33
469	J-426	581,027.60	5,931,617.03	710.00	0	77.10	764.34
470	J-427	581,474.51	5,931,632.42	711.07	0.1	75.60	764.37
472	J-433	581,230.40	5,931,623.34	710.40	0.01	76.60	764.34
473	J-455	585,032.66	5,934,913.17	682.73	0.01	72.70	733.96
474	J-456	584,578.32	5,935,458.14	674.14	0	60.90	717.01
475	J-457	584,473.57	5,935,561.72	668.91	0.02	68.30	717.01
476	J-458	584,552.88	5,935,630.17	668.40	0.01	69.00	717.01
477	J-459	584,630.33	5,935,622.09	670.00	0	66.70	717.01
478	J-460	584,399.04	5,935,479.51	669.91	0.01	66.90	717.01
479	J-462	584,407.26	5,935,625.71	666.69	0.01	71.40	717.01
480	J-473	584,318.20	5,935,632.34	665.00	0	73.80	717.01
481	J-474	580,907.43	5,933,564.98	687.95	0	81.00	744.99
482	J-475	584,394.68	5,934,582.93	689.24	0	63.50	733.96
483	J-476	584,378.97	5,934,558.28	688.81	0	64.10	733.96
484	J-477	584,385.26	5,934,422.76	691.17	0.04	60.70	733.96
485	J-478	584,452.79	5,934,337.14	695.00	0.02	55.30	733.96
486	J-479	584,456.37	5,934,203.11	695.00	0	55.30	733.96
487	J-480	584,346.35	5,934,199.50	695.00	0.02	55.30	733.96
488	untry Sq	584,451.06	5,934,432.27	692.57	0	58.70	733.96
489	J-482	584,501.53	5,934,435.28	693.17	0	57.90	733.96
490	J-483	582,554.17	5,934,938.61	663.74	0	74.50	716.20
491	J-484	580,257.71	5,934,709.77	655.00	0.03	86.90	716.20

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
492	J-485	580,164.03	5,934,700.83	655.00	0.01	86.90	716.20
493	Greenbria	580,160.09	5,934,602.78	655.28	0.04	86.50	716.20
494	J-487	580,157.19	5,934,461.58	658.62	0.01	81.70	716.20
495	J-488	580,264.39	5,934,426.70	660.00	0	79.80	716.20
496	J-489	580,262.15	5,934,273.16	662.79	0.01	75.80	716.20
497	J-490	580,263.09	5,934,169.52	664.93	0.16	72.80	716.20
498	J-491	580,263.09	5,934,052.82	668.12	0	68.20	716.20
499	J-492	580,603.96	5,933,233.91	687.77	0.02	81.20	744.99
500	J-493	580,285.22	5,933,229.98	685.12	0	85.00	745.00
501	J-494	580,019.98	5,933,222.44	681.92	0	89.50	744.99
502	J-496	579,846.07	5,933,216.09	683.33	0	87.50	744.99
503	J-497	579,558.48	5,933,207.86	680.78	0.18	91.20	744.99
504	J-498	579,384.04	5,933,248.61	680.76	0	91.20	744.99
505	J-499	580,585.32	5,935,532.59	655.00	0.03	86.90	716.19
506	J-500	580,800.29	5,934,469.04	664.91	0.03	72.80	716.20
507	Panatton	580,493.51	5,932,097.85	705.00	0.14	56.80	745.01
508	J-502	581,171.70	5,934,953.60	655.96	0.02	85.50	716.20
509	J-503	581,266.41	5,934,961.33	656.39	0.03	84.90	716.20
510	J-504	581,381.72	5,934,985.17	655.83	0.03	85.70	716.20
511	J-505	581,484.80	5,934,976.15	656.63	0.04	84.60	716.20
512	J-506	581,091.17	5,935,043.79	655.00	0.03	86.90	716.20
513	J-507	581,089.89	5,935,190.68	655.00	0.03	86.90	716.20
514	J-508	580,357.88	5,929,962.29	715.00	0	70.00	764.32
515	J-510	582,422.00	5,934,645.84	669.74	0	66.00	716.20
516	J-511	582,750.31	5,934,542.81	677.72	0	54.60	716.20
518	J-338	584,547.50	5,934,594.73	690.00	0.02	62.40	733.96
519	J-339	584,844.68	5,934,804.41	685.00	0.04	69.50	733.96
520	J-340	584,755.52	5,934,642.61	690.00	0.1	62.40	733.96
521	J-341	584,801.75	5,934,584.83	690.00	0.03	62.40	733.96
522	J-342	584,626.74	5,934,593.08	689.17	0	63.60	733.96
523	J-343	584,630.05	5,934,465.96	690.99	0.06	61.00	733.96
524	J-344	584,677.93	5,934,368.55	692.43	0	59.00	733.96
525	J-345	584,719.20	5,934,290.95	693.49	0.05	57.40	733.96
526	J-346	584,743.41	5,934,208.42	694.61	0	55.80	733.96
527	J-347	579,821.81	5,934,839.28	655.41	0	86.30	716.20
528	J-348	579,906.54	5,934,628.04	660.00	0.09	79.80	716.19
529	J-349	579,552.52	5,934,390.76	660.66	0.03	78.80	716.19
530	J-350	579,560.18	5,934,186.05	665.00	0	72.70	716.19
531	J-351	579,798.46	5,934,185.19	665.00	0.4	72.70	716.19
532	J-352	580,053.20	5,934,194.89	663.47	0	74.80	716.19
533	J-353	580,058.17	5,934,050.10	666.33	0	70.80	716.20
534	J-354	580,312.61	5,932,449.20	700.00	0	63.90	745.01
535	J-355	580,307.45	5,932,622.04	699.36	0	64.80	745.00
549	J-371	579,058.45	5,934,237.94	663.97	0	74.10	716.19
550	J-372	582,913.82	5,934,492.65	678.92	0	52.90	716.20
551	J-373	583,715.84	5,934,179.49	692.83	0	58.40	733.96
552	J-374	583,711.11	5,934,323.53	691.08	0.08	60.90	733.96
553	J-375	583,617.79	5,934,384.39	690.00	0	62.40	733.96

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
554	J-376	583,516.06	5,934,862.86	676.07	0	82.20	733.96
555	J-377	583,509.18	5,935,200.72	667.03	0	95.00	733.95
558	J-380	584,314.82	5,935,494.87	667.94	0	69.70	717.01
559	J-381	582,697.16	5,935,191.31	659.04	0	81.10	716.21
560	J-382	583,041.84	5,935,201.63	664.23	0	73.80	716.21
561	J-384	584,690.83	5,933,525.77	696.39	1	69.00	745.00
562	J-385	584,716.16	5,932,759.41	700.00	3.07	63.90	745.01
563	J-386	584,750.39	5,931,678.72	704.69	0	85.00	764.58
564	J-387	583,563.61	5,931,658.08	713.93	0	72.00	764.63
565	J-388	583,543.54	5,932,874.51	705.00	0.33	56.80	745.00
566	J-389	583,975.37	5,932,756.68	704.50	2.68	57.50	744.99
567	J-390	581,655.30	5,929,996.66	715.00	0.09	70.00	764.33
568	91 (Dum	580,970.38	5,929,997.16	715.00	0.68	70.00	764.32
569	J-392	580,813.36	5,929,007.00	720.00	0.01	62.90	764.32
570	J-393	581,663.98	5,929,028.48	715.00	4.54	70.00	764.33
577	J-400	579,105.90	5,930,558.91	710.00	2.53	77.10	764.31
579	J-402	582,479.98	5,930,426.58	717.66	0	66.60	764.54
588	J-412	582,422.40	5,929,556.63	716.72	0	67.70	764.38
593	J-424	581,660.97	5,929,623.62	713.50	0.03	72.20	764.33
594	J-425	581,665.24	5,929,366.79	715.00	0	70.00	764.33
596	J-429	584,050.71	5,934,639.34	683.04	0.18	72.30	733.96
600	J-435	584,997.94	5,934,344.14	690.00	0.26	62.40	733.96
601	J-436	585,098.32	5,934,735.10	689.76	0	62.70	733.96
602	J-437	584,749.37	5,934,767.29	686.86	0	66.90	733.96
603	J-438	584,571.05	5,934,804.08	690.00	0.03	62.40	733.96
604	J-439	580,563.59	5,929,433.52	710.00	1.71	77.10	764.32
614	J-449	581,421.38	5,932,595.83	704.53	0.21	57.40	745.00
615	J-450	579,529.68	5,930,833.39	710.00	0	77.10	764.31
616	J-451	582,718.01	5,933,794.15	686.82	0.08	82.60	744.99
617	J-452	584,568.62	5,934,437.45	692.38	0.07	59.00	733.96
618	J-453	584,709.29	5,934,821.05	685.00	0.06	69.50	733.96
619	J-454	578,967.63	5,931,180.10	705.00	0.09	84.20	764.31
620	J-463	579,109.34	5,929,955.19	715.00	1.85	70.00	764.31
621	J-481	579,912.34	5,929,983.06	710.05	0.12	77.00	764.31
623	J-495	581,742.29	5,930,634.26	710.00	0	77.10	764.33
624	J-514	581,024.45	5,930,758.71	710.00	0.04	77.10	764.33
625	J-509	582,414.25	5,929,796.24	715.00	2.47	70.10	764.39
1202	J-515	581,712.08	5,932,708.51	700.00	0.05	63.90	744.99
1205	J-516	581,669.94	5,929,192.84	715.00	0	70.00	764.33
1210	J-518	581,830.29	5,929,625.08	715.00	0	70.00	764.33
1212	J-519	581,835.07	5,929,999.06	715.66	0.34	69.10	764.33
1215	J-520	583,628.60	5,934,178.46	691.55	0	60.20	733.96
1217	J-521	579,709.90	5,934,475.78	661.19	0	78.10	716.19
1221	J-523	579,612.49	5,934,670.51	660.00	0	79.80	716.19
1223	J-524	579,458.36	5,934,392.85	660.00	0	79.80	716.19
1225	J-525	579,864.05	5,934,327.41	663.27	0	75.10	716.19
1247	J-529	581,722.82	5,930,546.21	711.81	0.18	74.50	764.33
1250	J-530	581,718.67	5,930,439.72	715.00	0	70.00	764.33

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1252	J-531	581,695.54	5,930,265.84	715.00	0.38	70.00	764.33
1254	J-532	581,651.35	5,930,158.96	715.00	0	70.00	764.33
1261	J-535	580,317.76	5,932,082.48	705.00	0	56.80	745.01
1266	J-536	579,735.35	5,931,890.66	705.76	2.48	83.00	764.26
1274	J-540	579,699.30	5,932,009.28	700.12	0	91.00	764.26
1276	J-541	579,799.44	5,931,732.09	706.82	0	81.50	764.26
1279	J-542	580,321.43	5,931,912.84	706.22	0	82.40	764.26
1293	J-547	580,088.01	5,932,060.24	705.55	0	83.30	764.26
1303	J-550	579,304.34	5,931,106.29	705.49	0.25	83.50	764.31
1308	J-552	581,774.56	5,934,875.22	660.36	0.19	79.30	716.20
1310	J-553	584,830.76	5,934,337.70	691.53	0	60.20	733.96
1313	J-554	581,603.99	5,933,308.60	689.95	0	78.10	744.99
1317	J-555	581,321.58	5,933,537.76	685.33	0	84.70	744.99
1320	J-556	581,323.99	5,933,415.23	687.59	0	81.50	744.99
1322	J-557	581,250.04	5,933,467.96	686.55	0	82.90	744.99
1323	J-558	581,327.56	5,933,467.96	686.59	0	82.90	744.99
1330	J-560	584,062.95	5,933,663.17	698.76	0.12	65.60	744.99
1333	J-561	582,080.53	5,931,638.76	710.00	0	77.40	764.52
1336	J-562	582,569.27	5,933,781.52	685.00	0.01	85.20	744.99
1339	J-563	583,023.88	5,933,806.52	689.56	0.27	78.70	744.99
1342	J-564	583,338.73	5,933,881.24	692.98	0	73.80	744.99
1345	J-565	582,744.06	5,932,889.49	701.99	0	61.00	744.99
1348	J-566	582,939.07	5,932,645.59	708.52	0.01	51.80	744.99
1351	J-567	583,002.33	5,932,556.57	709.00	0.01	51.10	744.99
1353	J-568	581,247.75	5,932,942.22	695.05	0.14	70.90	745.00
1356	J-569	580,577.37	5,932,096.86	705.31	0	56.30	745.01
1359	J-570	580,889.17	5,932,276.53	705.71	0	55.80	745.00
1362	J-571	580,880.65	5,932,177.12	706.82	0	54.20	745.00
1366	J-573	579,703.90	5,930,618.74	710.00	0.05	77.10	764.31
1369	J-574	579,904.79	5,930,431.14	710.00	0.5	77.10	764.31
1372	J-575	580,334.11	5,930,381.44	712.92	0	73.00	764.32
1375	J-576	581,433.82	5,929,694.07	715.00	0.45	70.00	764.33
1385	J-577	578,886.69	5,931,210.46	705.00	0	84.20	764.31
1387	J-578	580,835.80	5,932,122.19	707.37	0	53.40	745.00
1390	J-579	579,380.19	5,933,203.20	681.18	0	90.60	744.99
1395	J-582	579,207.27	5,933,179.51	680.57	1.11	91.5	744.99
1399	J-584	583,409.70	5,930,823.23	715	0	70.4	764.61
1405	J-586	581,295.24	5,929,939.38	715	0.03	70	764.32
1410	J-588	582,796.31	5,931,225.82	716.44	0.4	68.7	764.85
1425	J-591	583,549.35	5,932,202.80	710	0	77.5	764.61
1428	J-592	578,708.52	5,931,205.20	706.2	0.57	82.5	764.31
1449	J-601	579,260.41	5,934,216.98	664.6	0.73	73.2	716.19
1452	J-602	579,239.65	5,934,831.22	656.38	0	84.9	716.19
1459	J-604	580,481.32	5,934,271.82	664.6	0.74	73.2	716.2
1473	J-607	579,543.45	5,929,983.64	715	0	70	764.31
1475	J-608	580,203.48	5,929,958.96	713.28	0	72.4	764.31
1478	J-609	580,201.01	5,929,860.38	713.35	0	72.3	764.31
1480	J-610	580,552.48	5,929,989.36	715	0.19	70	764.32

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1483	J-611	580,325.86	5,930,727.51	710	0	77.1	764.32
1499	J-613	584,353.40	5,933,669.57	695.76	2.87	69.9	744.99
1504	J-614	582,934.11	5,932,889.06	702.94	0.52	59.7	744.99
1526	J-619	583,965.70	5,931,182.45	713.27	2.07	72.9	764.6
1548	J-624	580,979.44	5,929,436.53	710	0	77.1	764.32
1552	J-626	582,439.40	5,929,055.55	714.43	0	70.9	764.36
1556	J-628	580,375.92	5,929,164.92	717.44	0	66.5	764.32
1559	J-629	580,365.57	5,929,526.73	705	0	84.2	764.32
1604	J-632	580,288.92	5,933,147.51	687.49	0	81.6	745
1619	J-634	580,375.70	5,929,000.34	718.77	0	64.7	764.32
1623	J-635	582,786.29	5,930,481.33	720	4.05	63.3	764.62
1681	J-642	581,668.12	5,929,095.99	715	0	70	764.33
1711	J-644	583,046.25	5,935,496.03	657.92	0.77	82.7	716.21
1741	J-647	581,271.30	5,929,015.97	720	0	62.9	764.33
1744	48 (Dum	581,275.92	5,928,657.02	720	0.68	62.9	764.33
1746	J-649	581,116.31	5,928,684.12	720	0	62.9	764.32
1748	J-650	581,110.60	5,929,012.69	721.17	0	61.3	764.33
1857	J-662	581,970.85	5,935,022.33	659.84	0.04	80	716.2
1859	J-663	582,116.21	5,935,056.50	657.14	0.05	83.8	716.2
1930	J-668	579,102.84	5,931,112.30	705.76	0.25	83.1	764.31
1933	J-669	583,535.99	5,932,752.55	705	0	56.8	745.01
1936	J-670	583,961.86	5,933,365.46	702.7	0.94	60	744.99
1938	J-671	583,518.52	5,931,175.41	715	1.98	70.4	764.61
1941	J-672	584,343.63	5,931,657.91	705	0	84.6	764.59
1944	J-673	580,373.82	5,928,781.54	710.94	0.33	75.8	764.32
1947	J-674	584,337.86	5,932,018.97	706.68	3.86	82.2	764.6
1949	J-675	579,907.29	5,930,219.27	710	0.5	77.1	764.31
1952	J-676	580,043.39	5,929,961.76	711.5	0.15	75	764.31
1955	J-677	581,118.82	5,928,478.68	720	1.4	62.9	764.32
1956	J-678	580,803.49	5,928,525.59	713.58	0	72	764.32
1957	J-679	580,802.56	5,928,372.79	716.43	0	68	764.32
1959	J-681	580,378.87	5,928,367.84	710	0	77.1	764.32
1965	J-682	578,966.18	5,934,323.21	662.52	0.19	76.2	716.19
1969	J-683	580,796.56	5,933,569.23	687.51	0.96	81.6	744.99
1970	J-684	580,269.86	5,933,725.09	675.19	0.43	99.1	744.99
1974	J-685	580,448.50	5,933,230.44	686.51	1.12	83	744.99
1977	J-686	580,280.05	5,933,437.59	680.95	0.56	90.9	744.99
1980	J-687	580,334.63	5,930,185.02	714.34	0.11	70.9	764.32
1983	J-688	580,557.45	5,930,744.75	710	0.15	77.1	764.32
1986	J-689	581,209.13	5,929,990.60	715	0.4	70	764.32
1989	J-690	582,115.87	5,934,642.64	664.96	0.37	72.7	716.2
1995	J-692	580,367.90	5,935,411.75	655	0.19	86.9	716.19
1998	J-693	580,939.14	5,935,207.44	655	0.03	86.9	716.2
2001	J-694	581,593.23	5,933,015.33	699.23	0.42	65	744.99
2004	J-695	581,706.64	5,932,861.89	698.36	0.5	66.2	744.99
2007	J-696	585,110.51	5,930,733.81	710	0.43	77.5	764.61
2009	J-697	580,594.61	5,929,003.29	722.94	0.61	58.7	764.32
2012	J-698	579,772.86	5,930,616.65	710	0.11	77.1	764.31

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
2015	J-699	581,656.96	5,929,786.31	715	0.06	70	764.33
2024	J-701	579,705.90	5,933,212.88	682	0	89.4	744.99
2027	J-702	582,798.78	5,931,094.66	716	0	69.3	764.84
2048	J-709	584,218.05	5,933,682.14	696.07	0	69.4	744.99
2064	J-713	584,319.60	5,931,332.55	708.64	0	79.4	764.6
2071	J-715	583,984.76	5,930,837.44	713.33	0	72.8	764.61
2093	J-718	583,981.82	5,932,017.05	712	0	74.7	764.61
2142	J-719	582,112.92	5,929,042.77	714.67	0	70.5	764.35
2145	J-720	581,900.54	5,929,036.19	714.83	0	70.3	764.34
2148	J-721	585,115.48	5,935,430.98	672.05	0	63.8	717.01
2153	J-723	581,364.59	5,933,637.12	683.4	0	87.4	744.99
2155	J-724	581,503.77	5,933,636.39	683.4	0	87.4	744.99
2157	J-725	581,505.07	5,933,898.96	680	0	92.2	744.99

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
654	P-120	J-102	J-116	63.00	200	120.00	0.00	0	0	0	PVC
655	P-156	J-147	J-148	80.00	200	120.00	0.58	0.02	0	0.004	PVC
656	P-78	J-73	J-74	58.00	200	120.00	-0.68	0.02	0	0.005	PVC
657	P-95	J-90	J-91	95.00	200	120.00	-0.85	0.03	0.001	0.008	PVC
658	P-74	J-69	J-70	140.00	200	120.00	-0.62	0.02	0.001	0.004	PVC
659	P-201	J-191	J-192	96.00	300	120.00	-3.27	0.05	0.001	0.013	PVC
660	P-5	J-5	J-7	173.00	200	120.00	-1.62	0.05	0.004	0.026	PVC
661	P-119	J-115	J-109	130.00	200	120.00	0.28	0.01	0	0.001	PVC
662	P-307(2)	J-471	J-470	147.00	300	120.00	-1.59	0.02	0.001	0.004	PVC
663	P-216	J-205	J-206	353.00	300	120.00	-2.16	0.03	0.002	0.006	PVC
664	P-124	J-119	J-110	95.00	200	120.00	0.09	0	0	0	PVC
665	P-17	J-17	J-18	122.00	300	110.00	-3.81	0.05	0.002	0.02	Asbestos Cement
666	P-11	J-11	J-12	113.00	300	120.00	-0.18	0	0	0	PVC
667	P-73	J-68	J-69	169.00	200	120.00	-0.58	0.02	0.001	0.004	PVC
668	P-235	J-223	J-224	98.00	300	120.00	-1.48	0.02	0	0.003	PVC
669	P-46	J-44	J-45	77.00	300	110.00	4.22	0.06	0.002	0.025	Asbestos Cement
670	P-152	J-131	J-145	12.00	200	120.00	-0.81	0.03	0	0.006	PVC
671	P-141	J-134	J-135	126.00	150	120.00	0.05	0	0	0	PVC
672	P-30	J-28	J-29	73.00	300	110.00	-3.89	0.05	0.002	0.021	Asbestos Cement
673	P-195	J-185	J-186	131.00	300	120.00	0.47	0.01	0	0	PVC
674	P-306(2)	J-472	J-471	85.00	300	120.00	-1.59	0.02	0	0.003	PVC
675	P-215	J-204	J-205	197.00	300	120.00	-2.16	0.03	0.001	0.006	PVC
676	P-159	J-150	J-151	35.00	200	120.00	0.09	0	0	0	PVC
677	P-16	J-13	J-17	156.00	300	110.00	-3.81	0.05	0.003	0.021	Asbestos Cement
678	P-160	J-151	J-152	71.00	200	120.00	0.07	0	0	0	PVC
679	P-110	J-106	J-107	37.00	200	120.00	-0.03	0	0	0	PVC
680	P-10	J-10	J-11	167.00	300	120.00	-0.11	0	0	0	PVC
681	P-234	J-222	J-223	81.00	300	120.00	-1.47	0.02	0	0.004	PVC
682	P-72	J-67	J-58	158.00	300	110.00	9.70	0.14	0.019	0.116	Asbestos Cement
683	P-135	J-128	J-129	126.00	150	120.00	0.21	0.01	0	0.002	PVC
684	P-26	J-25 (Dummy)	J-26	119.00	300	110.00	0.24	0	0	0	Asbestos Cement
685	P-172	J-162	J-163	145.00	300	120.00	-1.97	0.03	0.001	0.005	PVC
686	P-140	J-133	J-134	114.00	200	120.00	0.08	0	0	0	PVC
687	P-158	J-149	J-150	30.00	200	120.00	0.09	0	0	0	PVC
688	P-52	J-49	J-50	146.00	300	110.00	1.27	0.02	0	0.003	Asbestos Cement
689	P-148	J-129	J-141	83.00	150	120.00	0.00	0	0	0	PVC
690	P-182	J-173	J-174	102.00	200	120.00	-0.21	0.01	0	0	PVC
691	P-282	J-252	J-253	357.00	300	120.00	0.42	0.01	0	0	HDPE
692	P-217	J-206	J-207	75.00	300	120.00	-4.84	0.07	0.005	0.027	PVC
693	P-15	J-15	J-16	51.00	300	110.00	-5.89	0.08	0.002	0.047	Asbestos Cement
694	P-109	J-99	J-106	76.00	200	120.00	0.00	0	0	0	PVC
695	P-142	J-135	J-136	88.00	200	120.00	0.43	0.01	0	0.003	PVC
696	P-181	J-172	J-173	65.00	200	120.00	0.45	0.01	0	0.002	PVC
697	P-71	J-66	J-67	156.00	300	110.00	9.71	0.14	0.017	0.117	Asbestos Cement
698	P-193	J-183	J-184	75.00	300	120.00	0.62	0.01	0	0	PVC
699	P-238	J-226	J-227	86.00	300	120.00	0.43	0.01	0	0	PVC
700	P-157	J-148	J-149	48.00	200	120.00	0.23	0.01	0	0	PVC
701	P-75	J-70	J-71	128.00	200	120.00	0.09	0	0	0	PVC
702	P-147	J-129	J-140	62.00	150	120.00	0.89	0.05	0.002	0.035	PVC
703	P-129	J-122	J-123	62.00	200	120.00	-0.07	0	0	0	PVC
704	P-92	J-87	J-88	83.00	200	120.00	-0.74	0.02	0.001	0.006	PVC
705	P-171	J-161	J-162	175.00	300	120.00	-1.97	0.03	0.001	0.005	PVC
706	P-206	J-196	J-197	78.00	300	120.00	-1.49	0.02	0	0.003	PVC
707	P-45	J-43	J-44	40.00	300	110.00	5.52	0.08	0.002	0.04	Asbestos Cement
708	P-258	PMP-101	J-234	2.00	150	120.00	0.00	0	0	0	PVC
709	P-276	J-248	J-211	11.00	300	120.00	6.98	0.1	0.001	0.054	PVC
710	P-189	J-179	J-180 (Dummy)	237.00	350	120.00	-1.07	0.01	0	0.001	PVC
711	P-33	J-31	J-32	76.00	300	110.00	-2.64	0.04	0.001	0.011	Asbestos Cement
712	P-84	J-79	J-80 (Dummy)	386.00	250	120.00	0.18	0	0	0	PVC
713	P-255	PMP-104	J-237	2.00	250	120.00	0.00	0	0	0	PVC
714	P-29	J-27	J-28	77.00	300	110.00	-3.89	0.05	0.002	0.022	Asbestos Cement
715	P-118	J-114	J-115	108.00	200	120.00	0.29	0.01	0	0.001	PVC
716	P-9	J-5	J-10	137.00	200	120.00	-0.05	0	0	0	PVC
718	P-229	J-217	J-218	31.00	300	120.00	-19.26	0.27	0.011	0.354	PVC
719	P-265	J-241	PMP-103	2.00	600	120.00	0.00	0	0	0	PVC
720	P-210	J-200	J-201	211.00	300	120.00	-1.89	0.03	0.001	0.005	PVC
721	P-232	J-220	J-221	94.00	300	120.00	-1.47	0.02	0	0.003	PVC
722	P-32	J-30	J-31	86.00	300	110.00	-3.91	0.06	0.002	0.021	Asbestos Cement
723	P-108	J-96	J-105	160.00	200	120.00	0.05	0	0	0	PVC
724	P-133	J-126	J-127	125.00	150	120.00	0.31	0.02	0.001	0.005	PVC
725	P-174	J-164	J-165	87.00	300	120.00	-2.96	0.04	0.001	0.011	PVC
726	P-134	J-127	J-128	116.00	150	120.00	0.28	0.02	0	0.004	PVC
727	P-190	J-180 (Dummy)	J-181	119.00	350	120.00	0.09	0	0	0	PVC
728	P-211	J-201	J-202	129.00	360	120.00	0.20	0	0	0	HDPE
729	P-300	OLD FIRE PUMP	J-265	145.00	300	120.00	0.00	0	0	0	PVC
730	P-144	J-122	J-137	191.00	200	120.00	-0.39	0.01	0	0.002	PVC
731	P-231	J-219	J-220	100.00	300	120.00	-1.39	0.02	0	0.002	PVC
732	P-70	J-65	J-66	106.00	300	110.00	-6.36	0.09	0.006	0.053	Asbestos Cement
733	P-35	J-33	J-34	60.00	300	110.00	-2.67	0.04	0.001	0.011	Asbestos Cement
734	P-117	J-113	J-114	51.00	200	120.00	-0.13	0	0	0	PVC
735	P-184	J-175	J-177	34.00	200	120.00	-0.26	0.01	0	0	PVC
736	P-112	J-108	J-109	88.00	200	120.00	-0.04	0	0	0	PVC
737	P-150	J-141	J-143	23.00	150	120.00	0.00	0	0	0	PVC
738	P-177	J-167	J-168	458.00	300	120.00	-2.09	0.03	0.002	0.006	PVC
739	P-115	J-97	Lakeshore	143.00	200	120.00	-0.08	0	0	0.001	PVC
740	P-192	J-182	J-183	257.00	350	120.00	-0.94	0.01	0	0.001	PVC
741	P-251	J-235	J-236	2.00	400	120.00	0.00	0	0	0	PVC
742	P-68	J-63	Acheson Zone 3	124.00	300	110.00	-6.28	0.09	0.007	0.053	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
743	P-309	J-469	J-468 (Dummy)	89.00	300	120.00	-1.59	0.02	0	0.003	PVC
744	P-146	J-128	J-139	63.00	150	120.00	0.03	0	0	0	PVC
745	P-97	J-93	J-94	73.00	200	120.00	-0.05	0	0	0	PVC
746	P-237	J-224	J-226	96.00	300	120.00	0.45	0.01	0	0	PVC
747	P-128	J-121	J-122	38.00	200	120.00	-0.44	0.01	0	0.003	PVC
748	P-22	J-21	J-22	200.00	300	110.00	-2.91	0.04	0.003	0.013	Asbestos Cement
749	P-122	J-117	J-118	130.00	200	120.00	-0.07	0	0	0	PVC
750	P-230	J-183	J-219	149.00	300	120.00	-1.37	0.02	0	0.003	PVC
751	P-104	J-100	J-101	111.00	200	120.00	0.10	0	0	0	PVC
753	P-61	J-57	J-58	116.00	300	110.00	-1.63	0.02	0.001	0.004	Asbestos Cement
754	P-126	J-114	J-120	75.00	200	120.00	-0.42	0.01	0	0.002	PVC
755	P-28	J-22	J-27	72.00	300	110.00	-3.86	0.05	0.001	0.02	Asbestos Cement
756	P-44	J-42	J-43	77.00	300	110.00	5.52	0.08	0.003	0.042	Asbestos Cement
757	P-197	J-187	J-188	74.00	300	120.00	0.45	0.01	0	0	PVC
758	P-20	J-19	J-20	49.00	300	110.00	-2.87	0.04	0.001	0.012	Asbestos Cement
759	P-80	J-75	J-76	179.00	200	120.00	-0.59	0.02	0.001	0.004	PVC
760	P-261	J-241	J-242	2.00	600	120.00	0.00	0	0	0	PVC
761	P-298	J-234	J-265	2.00	300	120.00	0.00	0	0	0	PVC
762	P-102	J-98	J-99	87.00	200	120.00	0.22	0.01	0	0.001	PVC
763	P-254	J-238	PMP-105	2.00	250	120.00	0.00	0	0	0	PVC
764	P-291	J-192	J-264	218.00	300	120.00	-1.87	0.03	0.001	0.005	PVC
765	P-281	J-14	J-259	44.00	300	120.00	9.46	0.13	0.006	0.094	PVC
766	P-64	J-60	J-40	31.00	300	110.00	7.45	0.11	0.002	0.072	Asbestos Cement
767	P-3	J-3	J-4	65.00	300	120.00	-1.68	0.02	0	0.003	PVC
768	P-83	J-78	J-79	214.00	250	120.00	0.18	0	0	0	PVC
769	P-14	J-14	J-15	120.00	300	110.00	-5.83	0.08	0.004	0.045	Asbestos Cement
770	P-58	J-54	J-55	167.00	300	110.00	-7.16	0.1	0.011	0.066	Asbestos Cement
771	P-55	J-51	J-52	57.00	300	110.00	-7.12	0.1	0.003	0.065	Asbestos Cement
772	P-167	J-157	J-158	22.00	250	120.00	-2.38	0.05	0	0.02	PVC
773	P-137	J-130	J-131	98.00	200	120.00	-0.77	0.02	0.001	0.006	PVC
774	P-105	J-101	J-102	98.00	200	120.00	0.06	0	0	0	PVC
775	P-101	J-97	J-98	173.00	200	120.00	0.25	0.01	0	0	PVC
776	P-188	J-178	J-179	247.00	350	120.00	-1.07	0.01	0	0.001	PVC
777	P-228	J-217	J-66	67.00	300	120.00	19.26	0.27	0.022	0.352	PVC
778	P-38	J-36	J-37	94.00	300	110.00	-3.51	0.05	0.002	0.018	Asbestos Cement
779	P-41	J-39	J-40	154.00	300	110.00	-3.52	0.05	0.003	0.018	Asbestos Cement
780	P-154	J-145	J-146	133.00	200	120.00	-0.97	0.03	0.001	0.01	PVC
781	P-63	J-59	J-60	123.00	300	110.00	7.45	0.11	0.008	0.071	Asbestos Cement
782	P-164	J-149	J-156	36.00	200	120.00	0.12	0	0	0	PVC
784	P-287	J-257	J-255	556.00	200	120.00	-0.26	0.01	0	0.001	HDPE
785	P-59	J-55	J-56 (Dummy)	74.00	300	110.00	-0.95	0.01	0	0.002	Asbestos Cement
786	P-243	J-231	J-73	144.00	200	120.00	0.12	0	0	0.001	PVC
787	P-264	J-242	PMP-102	2.00	600	120.00	0.00	0	0	0	PVC
788	P-7	J-7	J-8	371.00	300	120.00	-1.63	0.02	0.001	0.004	PVC
789	P-268	R-1	J-239	2.00	600	120.00	0.00	0	0	0	PVC
790	P-88	J-83	J-84	56.00	200	120.00	-0.25	0.01	0	0.001	PVC
791	P-121	J-116	J-117	92.00	200	120.00	-0.03	0	0	0	PVC
792	P-79	J-74	J-75	142.00	200	120.00	-0.68	0.02	0.001	0.005	PVC
793	P-24	J-23	J-24	158.00	300	110.00	0.92	0.01	0	0.001	Asbestos Cement
794	P-47	J-45	J-46	103.00	300	110.00	4.20	0.06	0.002	0.025	Asbestos Cement
795	P-31	J-29	J-30	83.00	300	110.00	-3.89	0.06	0.002	0.022	Asbestos Cement
796	P-196	J-186	J-187	92.00	300	120.00	0.47	0.01	0	0	PVC
797	P-107	J-94	J-104	107.00	200	120.00	-0.35	0.01	0	0.002	PVC
799	P-161	J-152	J-153	68.00	200	120.00	0.16	0	0	0.001	PVC
800	P-250	J-234	J-235	2.00	400	120.00	0.00	0	0	0	PVC
801	P-136	J-129	J-130	187.00	200	120.00	-0.74	0.02	0.001	0.006	PVC
802	P-27	J-26	J-16	95.00	300	110.00	5.89	0.08	0.005	0.046	Asbestos Cement
803	P-173	J-163	J-164	99.00	300	120.00	-2.48	0.04	0.001	0.007	PVC
804	P-66	J-61	J-62	112.00	300	110.00	-6.25	0.09	0.006	0.051	Asbestos Cement
805	P-284	J-68	J-255	311.00	200	120.00	0.54	0.02	0.001	0.003	HDPE
806	P-257	PMP-102	J-235	2.00	150	120.00	0.00	0	0	0	PVC
807	P-218	J-207	J-208	408.00	300	120.00	2.10	0.03	0.003	0.006	PVC
808	P-239	J-227	J-228	96.00	300	120.00	-0.11	0	0	0	PVC
809	P-18	J-18	J-8	31.00	300	110.00	-0.94	0.01	0	0.002	Asbestos Cement
811	P-130	J-123	J-124	65.00	200	120.00	-0.08	0	0	0	PVC
812	P-143	J-136	J-126	89.00	200	120.00	0.43	0.01	0	0.002	PVC
813	P-93	J-88	J-89	68.00	200	120.00	-0.78	0.02	0	0.008	PVC
814	P-207	J-197	J-198	121.00	300	120.00	0.23	0	0	0.001	PVC
815	P-149	J-141	J-142	40.00	150	120.00	0.00	0	0	0	PVC
816	P-259	J-239	J-240	2.00	600	120.00	0.00	0	0	0	PVC
817	P-34	J-32	J-33	60.00	300	110.00	-2.67	0.04	0.001	0.01	Asbestos Cement
818	P-85	J-80 (Dummy)	J-81	125.00	250	120.00	-0.50	0.01	0	0.001	PVC
819	P-256	PMP-103	J-236	2.00	200	120.00	0.00	0	0	0	PVC
820	P-183	J-174	J-175	119.00	200	120.00	-0.24	0.01	0	0.001	PVC
821	P-266	J-240	PMP-104	2.00	600	120.00	0.00	0	0	0	PVC
822	P-111	J-107	J-108	99.00	200	120.00	-0.03	0	0	0	PVC
823	P-308(2)	J-470	J-469	207.00	300	120.00	-1.59	0.02	0.001	0.004	PVC
824	P-233	J-221	J-222	79.00	300	120.00	-1.47	0.02	0	0.003	PVC
825	P-175	J-165	J-166	352.00	300	120.00	-6.21	0.09	0.013	0.043	PVC
826	P-53	J-50	J-31	149.00	300	110.00	1.27	0.02	0	0.003	Asbestos Cement
827	P-96	J-86	J-92	190.00	200	120.00	0.02	0	0	0	PVC
828	P-191	J-181	J-182	234.00	350	120.00	-0.55	0.01	0	0	PVC
831	P-145	J-138	J-128	73.00	150	120.00	0.00	0	0	0	PVC
832	P-273	J-218	J-246	35.00	300	120.00	-19.26	0.27	0.01	0.351	PVC
833	P-185	J-177	J-170	76.00	200	120.00	0.00	0	0	0	PVC
834	P-213	J-201	J-203	142.00	300	120.00	-2.09	0.03	0.001	0.006	PVC
835	P-114	J-110	J-111	107.00	200	120.00	0.05	0	0	0.001	PVC
836	P-178	J-168	J-169	64.00	300	120.00	-2.83	0.04	0.001	0.01	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
837	P-151	J-143	J-144	26.00	150	120.00	0.00	0	0	0	PVC
838	P-67	J-62	J-63	99.00	300	110.00	-6.25	0.09	0.005	0.051	Asbestos Cement
839	P-310(2)	J-468 (Dummy)	J-467	69.00	300	120.00	-2.28	0.03	0.001	0.007	PVC
840	P-42	J-40	J-41	91.00	300	110.00	5.55	0.08	0.004	0.041	Asbestos Cement
841	P-123	J-109	J-119	21.00	200	120.00	0.21	0.01	0	0	PVC
842	P-12	J-12	J-13	89.00	300	120.00	-0.18	0	0	0	PVC
843	P-127	J-120	J-121	205.00	200	120.00	-0.42	0.01	0	0.002	PVC
844	P-39	J-37	J-38	110.00	300	110.00	-3.51	0.05	0.002	0.018	Asbestos Cement
845	P-198	J-76	J-189	340.00	250	120.00	-0.77	0.02	0.001	0.002	PVC
846	P-21	J-20	J-21	62.00	300	110.00	-2.88	0.04	0.001	0.012	Asbestos Cement
847	P-252	J-236	J-237	2.00	400	120.00	0.00	0	0	0	PVC
848	P-81	J-76	J-77	87.00	250	120.00	0.18	0	0	0	PVC
849	P-293	J-264	J-261	179.00	300	120.00	-2.48	0.04	0.001	0.008	PVC
850	P-236	J-224	J-225	82.00	300	120.00	0.68	0.01	0	0.001	PVC
851	P-69	Acheson Zone 3	J-65	123.00	300	110.00	-6.36	0.09	0.007	0.053	Asbestos Cement
852	P-65	J-55	J-61	151.00	300	110.00	-6.24	0.09	0.008	0.052	Asbestos Cement
853	P-4	J-4	J-5	124.00	300	120.00	-1.68	0.02	0.001	0.004	PVC
854	P-168	J-158	J-159	265.00	300	120.00	-2.38	0.03	0.002	0.007	PVC
855	P-56	J-52	J-53	70.00	300	110.00	-7.12	0.1	0.005	0.066	Asbestos Cement
856	P-139	J-132	J-133	106.00	200	120.00	0.14	0	0	0.001	PVC
857	P-36	J-34	J-35	61.00	300	110.00	-2.67	0.04	0.001	0.011	Asbestos Cement
858	P-103	J-99	J-100	157.00	200	120.00	0.16	0	0	0	PVC
859	P-98	J-94	J-95	59.00	200	120.00	0.30	0.01	0	0.001	PVC
860	P-116	Lakeshore	J-113	107.00	200	120.00	-0.13	0	0	0	PVC
861	P-305(2)	J-262	J-472	275.00	300	120.00	-1.57	0.02	0.001	0.003	PVC
863	P-165	J-156	J-152	29.00	200	120.00	0.12	0	0	0	PVC
864	P-221	J-210	J-211	208.00	300	120.00	-6.98	0.1	0.011	0.054	PVC
865	P-60	J-56 (Dummy)	J-57	133.00	300	110.00	-1.63	0.02	0.001	0.004	Asbestos Cement
866	P-244	J-135	J-232	151.00	200	120.00	-0.44	0.01	0	0.002	PVC
867	P-106	J-102	J-103	82.00	200	120.00	0.03	0	0	0	PVC
868	P-269	J-35	J-244	73.00	350	120.00	7.89	0.08	0.001	0.031	PVC
869	P-89	J-84	J-85	64.00	200	120.00	-0.26	0.01	0	0.001	PVC
870	P-25	J-24	J-25 (Dummy)	124.00	300	110.00	0.92	0.01	0	0.002	Asbestos Cement
871	P-23	J-22	J-23	47.00	300	110.00	0.93	0.01	0	0.002	Asbestos Cement
872	P-37	J-35	J-36	106.00	300	110.00	-3.51	0.05	0.002	0.018	Asbestos Cement
873	P-43	J-41	J-42	45.00	300	110.00	5.54	0.08	0.002	0.041	Asbestos Cement
874	P-19	J-18	J-19	89.00	300	110.00	-2.87	0.04	0.001	0.013	Asbestos Cement
876	P-77	J-70	J-73	144.00	200	120.00	-0.74	0.02	0.001	0.006	PVC
877	P-94	J-89	J-90	141.00	200	120.00	-0.80	0.03	0.001	0.007	PVC
878	P-260	J-240	J-241	2.00	600	120.00	0.00	0	0	0	PVC
879	P-267	J-239	PMP-105	2.00	600	120.00	0.00	0	0	0	PVC
880	P-297	J-243	OLD FIRE PUMP	4.00	500	120.00	0.00	0	0	0	PVC
881	P-253	J-237	J-238	2.00	400	120.00	0.00	0	0	0	PVC
882	P-186	J-176	J-177	48.00	200	120.00	0.26	0.01	0	0.002	PVC
883	P-86	J-81	J-82	220.00	200	120.00	0.23	0.01	0	0.001	PVC
884	P-274	J-246	J-247	370.00	300	120.00	6.98	0.1	0.02	0.054	PVC
885	P-214	J-203	J-204	29.00	300	120.00	-2.16	0.03	0	0.005	PVC
886	P-311(2)	J-467	J-466	82.00	300	120.00	-2.40	0.03	0.001	0.007	PVC
887	P-194	J-184	J-185	66.00	300	120.00	0.59	0.01	0	0.001	PVC
888	P-40	J-38	J-39	44.00	300	110.00	-3.52	0.05	0.001	0.017	Asbestos Cement
889	P-199	J-189	J-190	318.00	300	120.00	-3.27	0.05	0.004	0.013	PVC
890	P-162	J-153	J-154	39.00	200	120.00	0.13	0	0	0	PVC
891	P-82	J-77	J-78	43.00	250	120.00	0.18	0	0	0.002	PVC
892	P-54	J-35	J-51	62.00	300	110.00	-7.06	0.1	0.004	0.064	Asbestos Cement
893	P-57	J-53	J-54	91.00	300	110.00	-7.15	0.1	0.006	0.066	Asbestos Cement
894	P-99	J-95	J-96	66.00	200	120.00	0.29	0.01	0	0	PVC
895	P-166	J-147	J-157	23.00	200	120.00	-2.37	0.08	0.001	0.053	PVC
896	P-222	J-211	J-212	47.00	300	120.00	0.00	0	0	0	PVC
897	P-245	J-133	J-233	76.00	200	120.00	0.04	0	0	0	PVC
898	P-1	J-1	J-2	158.00	300	120.00	-1.48	0.02	0.001	0.003	PVC
899	P-90	J-85	J-86	140.00	200	120.00	-0.69	0.02	0.001	0.005	PVC
900	P-13	J-13	J-14	30.00	300	110.00	3.63	0.05	0.001	0.02	Asbestos Cement
901	P-48	J-46	J-47	139.00	300	110.00	4.20	0.06	0.003	0.025	Asbestos Cement
903	P-155	J-146	J-147	23.00	200	120.00	-0.97	0.03	0	0.008	PVC
904	P-302(2)	J-259	J-461	628.00	300	120.00	9.34	0.13	0.031	0.093	PVC
905	P-240	J-208	J-230	357.00	300	120.00	-0.89	0.01	0	0.001	PVC
906	P-187	J-168	J-178	363.00	350	120.00	-1.00	0.01	0	0.001	PVC
907	P-262	J-242	J-243	2.00	600	120.00	0.00	0	0	0	PVC
908	P-275	J-247	J-248	75.00	300	120.00	6.98	0.1	0.004	0.054	PVC
909	P-312(2)	J-466	J-465	94.00	300	120.00	-2.40	0.03	0.001	0.007	PVC
910	P-153	J-145	J-132	114.00	200	120.00	0.17	0.01	0	0	PVC
911	P-62	J-58	J-59	127.00	300	110.00	8.06	0.11	0.011	0.083	Asbestos Cement
912	P-163	J-154	J-155	61.00	200	120.00	0.10	0	0	0	PVC
913	P-208	J-198	J-199	68.00	300	120.00	0.01	0	0	0	PVC
914	P-100	J-96	J-97	141.00	200	120.00	0.21	0.01	0	0.001	PVC
915	P-91	J-86	J-87	166.00	200	120.00	-0.74	0.02	0.001	0.006	PVC
916	P-49	J-47	J-26	98.00	300	110.00	4.19	0.06	0.002	0.024	Asbestos Cement
917	P-314(2)	J-464	J-230	207.00	300	120.00	0.90	0.01	0	0.001	PVC
918	P-242	J-229	J-230	45.00	250	120.00	-0.01	0	0	0	PVC
919	P-6	J-7	J-6	24.00	200	120.00	0.01	0	0	0	PVC
920	P-263	J-243	PMP-101	2.00	600	120.00	0.00	0	0	0	PVC
921	P-2	J-2	J-3	142.00	300	120.00	-1.59	0.02	0.001	0.004	PVC
922	P-180	J-171	J-172	67.00	200	120.00	0.48	0.02	0	0.002	PVC
923	P-50	J-44	J-48	97.00	300	110.00	1.30	0.02	0	0.003	Asbestos Cement
924	P-169	J-159	J-160	124.00	300	120.00	-2.38	0.03	0.001	0.007	PVC
925	P-315(2)	J-465	J-464	45.00	300	120.00	-2.40	0.03	0	0.009	PVC
926	P-87	J-82	J-83	149.00	200	120.00	-0.21	0.01	0	0.001	PVC
927	P-51	J-48	J-49	123.00	300	110.00	1.30	0.02	0	0.003	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
928	P-170	J-160	J-161	104.00	300	120.00	-1.97	0.03	0.001	0.006	PVC
929	P-179	J-163	J-171	113.00	200	120.00	0.51	0.02	0	0.003	PVC
930	P-113	J-231	J-125	185.00	200	120.00	-0.12	0	0	0	PVC
931	P-203	J-125	J-209	180.00	200	120.00	0.03	0	0	0	PVC
932	P-204	J-125	J-214	107.00	200	120.00	0.00	0	0	0	PVC
933	P-205	J-193	J-215	201.00	300	120.00	2.18	0.03	0.001	0.006	PVC
934	P-219	J-26	J-216	167.00	200	110.00	-1.46	0.05	0.004	0.025	Asbestos Cement
935	P-303	J-193	J-274	39.00	300	120.00	-2.43	0.03	0	0.006	PVC
936	P-305	J-274	J-194	198.00	200	120.00	0.03	0	0	0	PVC
937	P-306	J-189	J-274	249.00	300	120.00	2.46	0.03	0.002	0.008	PVC
938	P-307	J-228	J-275	314.00	300	120.00	-0.16	0	0	0	PVC
940	P-310	J-188	J-276	110.00	300	120.00	0.45	0.01	0	0.001	PVC
941	P-311	J-276	J-182	265.00	300	120.00	-0.36	0.01	0	0	PVC
942	P-312	J-276	J-277	170.00	300	120.00	0.80	0.01	0	0.001	PVC
944	P-314	J-278	J-279 (Dummy)	172.00	300	120.00	-26.24	0.37	0.111	0.626	PVC
945	P-315	J-279 (Dummy)	J-280	255.00	300	120.00	-26.93	0.38	0.15	0.656	PVC
946	P-413	J-369	J-9	217.00	300	120.00	-0.15	0	0	0	PVC
947	P-463	J-119	J-413	36.00	150	120.00	0.12	0.01	0	0.002	PVC
948	P-464	J-413	J-118	118.00	200	120.00	0.12	0	0	0	PVC
949	P-466	J-414	J-263	264.00	300	120.00	2.95	0.04	0.002	0.011	PVC
950	P-467	J-8	J-415	209.00	300	120.00	-2.61	0.04	0.002	0.009	PVC
952	P-469	J-262	J-416	50.00	300	120.00	2.96	0.04	0.001	0.011	PVC
953	P-470	J-416	J-414	71.00	300	120.00	2.96	0.04	0.001	0.011	PVC
954	P-471	J-244	J-417	188.00	600	120.00	7.89	0.03	0.001	0.002	HDPE
955	P-472	J-417	J-418	70.00	600	120.00	4.92	0.02	0	0.001	PVC
956	P-483	J-216	J-426	467.00	200	110.00	-1.46	0.05	0.012	0.025	Asbestos Cement
957	P-485	J-427	J-66	310.00	200	110.00	-3.19	0.1	0.033	0.107	Asbestos Cement
958	P-491	R-3	J-432	2.00	350	120.00	72.97	0.76	0.004	1.972	PVC
959	P-492	J-432	PMP-1	2.00	350	120.00	72.97	0.76	0.004	1.935	PVC
960	P-493	PMP-1	J-281	2.00	350	120.00	72.97	0.76	0.004	1.972	PVC
961	P-494	J-238	PRV-4	3.00	350	120.00	0.00	0	0	0	PVC
962	P-495	PRV-4	J-244	3.00	350	120.00	0.00	0	0	0	PVC
963	P-496	PRV-5	J-280	37.00	400	120.00	72.96	0.58	0.126	1.024	PVC
964	P-497	J-281	PRV-5	2.00	400	120.00	72.97	0.58	0.002	1.005	PVC
965	P-500	J-433	J-427	244.00	200	110.00	-3.10	0.1	0.025	0.101	Asbestos Cement
966	P-501	J-40	J-433	147.00	300	110.00	-1.62	0.02	0.001	0.004	Asbestos Cement
967	P-502	J-225	J-317	106.00	300	120.00	0.68	0.01	0	0.001	PVC
968	P-529	J-461	J-542	318.00	300	120.00	9.31	0.13	0.012	0.092	PVC
971	P-536	J-202	J-183	115.00	350	120.00	0.20	0	0	0	PVC
972	P-597	J-232	J-455	163.00	200	120.00	0.05	0	0	0	PVC
973	P-598	J-137	J-456	53.00	200	120.00	-0.43	0.01	0	0.003	PVC
974	P-599	J-456	J-457	147.00	200	120.00	0.44	0.01	0	0.003	PVC
975	P-600	J-457	J-458	105.00	200	120.00	0.01	0	0	0	PVC
976	P-601	J-458	J-459	75.00	200	120.00	0.00	0	0	0	PVC
977	P-602	J-457	J-460	112.00	200	120.00	0.01	0	0	0	PVC
978	P-603	J-457	J-462	99.00	200	120.00	0.40	0.01	0	0.002	PVC
979	P-604	J-462	J-473	83.00	200	120.00	0.40	0.01	0	0.002	PVC
982	P-607	J-263	J-261	199.00	300	120.00	1.99	0.03	0.001	0.005	PVC
983	P-608	J-263	J-474	104.00	300	120.00	0.96	0.01	0	0.001	PVC
984	P-609	J-155	J-475	48.00	200	120.00	0.07	0	0	0	PVC
985	P-610	J-475	J-476	99.00	200	120.00	0.07	0	0	0	PVC
986	P-611	J-476	J-477	118.00	200	120.00	0.07	0	0	0	PVC
987	P-612	J-477	J-478	106.00	200	120.00	0.04	0	0	0	PVC
988	P-613	J-478	J-479	100.00	200	120.00	0.02	0	0	0	PVC
989	P-614	J-479	J-480	106.00	200	120.00	0.02	0	0	0	PVC
990	P-615	J-478	Country Squire	134.00	200	120.00	0.00	0	0	0	PVC
991	P-616	Country Squire	J-482	51.00	200	120.00	0.00	0	0	0	PVC
992	P-617	J-483	J-88	77.00	200	120.00	0.00	0	0	0	PVC
993	P-618	J-255	J-484	74.00	300	120.00	-0.49	0.01	0	0.001	PVC
994	P-619	J-484	J-485	90.00	300	120.00	-0.52	0.01	0	0	PVC
995	P-620	J-485	Greenbriar	149.00	300	120.00	-0.53	0.01	0	0.001	PVC
996	P-621	Greenbriar	J-487	95.00	300	120.00	-0.56	0.01	0	0.001	PVC
997	P-622	J-487	J-488	146.00	300	120.00	-0.58	0.01	0	0.001	PVC
998	P-623	J-488	J-489	137.00	300	120.00	-0.58	0.01	0	0	PVC
999	P-624	J-489	J-490	161.00	300	120.00	0.86	0.01	0	0.001	PVC
1000	P-625	J-490	J-491	59.00	300	120.00	0.70	0.01	0	0.001	PVC
1001	P-626	J-472	J-492	200.00	300	120.00	0.03	0	0	0	PVC
1003	P-628	J-493	J-494	221.00	300	120.00	1.29	0.02	0.001	0.003	PVC
1004	P-631	J-496	J-701	290.00	300	120.00	1.29	0.02	0	0.003	PVC
1006	P-633	J-494	J-496	395.00	300	120.00	1.29	0.02	0	0.002	PVC
1007	P-634	J-256	J-499	159.00	200	120.00	0.03	0	0	0	HDPE
1008	P-635	J-125	J-500	208.00	200	120.00	-0.20	0.01	0	0	PVC
1009	P-636	J-500	J-193	123.00	200	120.00	-0.23	0.01	0	0.001	PVC
1012	P-639	J-75	J-502	104.00	200	120.00	-0.14	0	0	0	PVC
1013	P-640	J-502	J-503	95.00	200	120.00	-0.16	0.01	0	0.001	PVC
1014	P-641	J-503	J-504	118.00	200	120.00	-0.19	0.01	0	0.001	PVC
1015	P-642	J-504	J-505	103.00	200	120.00	-0.21	0.01	0	0	PVC
1016	P-643	J-75	J-506	84.00	200	120.00	0.06	0	0	0	PVC
1017	P-644	J-506	J-507	147.00	200	120.00	0.03	0	0	0	PVC
1018	P-533	J-426	J-433	198.00	200	110.00	-1.46	0.05	0.005	0.025	Asbestos Cement
1021	P-439	J-513	J-167	152.00	300	120.00	-6.22	0.09	0.005	0.043	HDPE
1023	P-441	J-148	J-338	252.00	200	120.00	0.34	0.01	0	0.001	PVC
1024	P-443	J-339	J-232	126.00	200	120.00	0.49	0.02	0	0.003	PVC
1025	P-445	J-340	J-341	74.00	200	120.00	0.03	0	0	0	PVC
1026	P-446	J-338	J-342	79.00	200	120.00	0.32	0.01	0	0.001	PVC
1027	P-447	J-342	J-340	138.00	200	120.00	-0.08	0	0	0	PVC
1028	P-448	J-342	J-343	127.00	200	120.00	0.40	0.01	0	0.002	PVC
1029	P-449	J-343	J-344	109.00	200	120.00	0.26	0.01	0	0.001	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1030	P-450	J-344	J-345	88.00	200	120.00	0.26	0.01	0	0.002	PVC
1031	P-451	J-345	J-346	107.00	200	120.00	0.00	0	0	0	PVC
1032	P-452	J-255	J-347	531.00	300	120.00	0.76	0.01	0	0.001	HDPE
1034	P-454	J-347	J-348	255.00	200	120.00	0.32	0.01	0	0.001	PVC
1036	P-456	J-349	J-350	241.00	250	120.00	0.21	0	0	0	PVC
1037	P-457	J-350	J-351	254.00	250	120.00	-0.30	0.01	0	0	PVC
1038	P-458	J-351	J-352	307.00	250	120.00	-0.70	0.01	0	0.002	PVC
1039	P-459	J-352	J-353	190.00	250	120.00	-0.70	0.01	0	0.002	PVC
1040	P-460	J-353	J-491	195.00	250	120.00	-0.70	0.01	0	0.002	PVC
1042	P-462	J-354	J-355	173.00	300	120.00	3.39	0.05	0.002	0.014	PVC
1057	P-499	J-511	J-372	586.00	250	120.00	-1.10	0.02	0.001	0.004	PVC
1058	P-504	J-176	J-373	101.00	200	120.00	-0.39	0.01	0	0.001	PVC
1059	P-505	J-373	J-374	144.00	200	120.00	-0.39	0.01	0	0.002	PVC
1060	P-506	J-374	J-375	147.00	200	120.00	-0.47	0.01	0	0.003	PVC
1061	P-507	J-375	J-164	158.00	200	120.00	-0.47	0.01	0	0.002	PVC
1062	P-508	J-165	J-376	357.00	200	120.00	1.62	0.05	0.009	0.026	PVC
1065	P-513	J-380	J-460	90.00	300	120.00	0.00	0	0	0	PVC
1066	P-514	J-91	J-381	67.00	200	120.00	-0.85	0.03	0.001	0.008	PVC
1067	P-515	J-381	J-382	353.00	200	120.00	-0.85	0.03	0.003	0.008	PVC
1069	P-517	J-473	J-104	80.00	200	120.00	0.40	0.01	0	0.002	PVC
1073	P-524	J-384	J-385	986.00	350	120.00	-5.30	0.06	0.012	0.015	PVC
1075	P-527	J-387	J-280	912.00	350	120.00	-26.05	0.27	0.264	0.291	PVC
1077	P-530	J-389	J-669	661.00	250	120.00	-3.06	0.06	0.012	0.028	PVC
1087	P-548	J-400	Supreme Steel	629.00	300	120.00	-2.22	0.03	0.003	0.006	PVC
1103	P-573	J-424	J-425	398.00	300	120.00	-1.85	0.03	0.001	0.005	PVC
1107	P-577	J-206	J-224	304.00	322	120.00	2.68	0.03	0.002	0.007	HDPE
1108	P-580	J-173	J-429	273.00	200	120.00	0.59	0.02	0.001	0.004	PVC
1109	P-581	J-429	J-160	203.00	200	120.00	0.41	0.01	0	0.002	PVC
1116	P-588	J-435	J-436	431.00	200	120.00	-0.04	0	0	0	PVC
1117	P-589	J-436	J-455	232.00	200	120.00	-0.04	0	0	0	PVC
1118	P-590	J-340	J-437	148.00	200	120.00	-0.21	0.01	0	0.001	PVC
1119	P-591	J-437	J-339	102.00	200	120.00	0.52	0.02	0	0.003	PVC
1120	P-593	J-438	J-147	134.00	300	120.00	-0.82	0.01	0	0.001	PVC
1124	P-630	J-505	J-82	489.00	200	120.00	-0.26	0.01	0	0.001	PVC
1137	P-664	J-385	PRV-16	32.00	350	120.00	-8.37	0.09	0.008	0.036	PVC
1138	P-665	PRV-16	J-386	969.00	350	120.00	-8.37	0.09	0.03	0.035	PVC
1143	P-678	J-511	J-510	93.00	250	120.00	1.10	0.02	0.001	0.004	PVC
1158	P-693	J-169	J-388	745.00	300	120.00	-3.39	0.05	0.007	0.014	PVC
1162	P-697	J-446	PMP-2	2.00	350	120.00	0.00	0	0	0	PVC
1163	P-698	PMP-2	J-447	2.00	350	120.00	0.00	0	0	0	PVC
1169	P-705	J-449	J-208	166.00	300	120.00	-2.98	0.04	0.001	0.011	PVC
1171	P-707	Supreme Steel	J-450	178.00	410	120.00	-0.14	0	0	0	HDPE
1172	P-708	J-450	J-1	334.00	400	120.00	-0.14	0	0	0	PVC
1174	P-710	J-343	J-452	68.00	200	120.00	0.07	0	0	0	PVC
1175	P-711	J-437	J-453	67.00	200	120.00	-0.73	0.02	0	0.007	PVC
1176	P-712	J-453	J-438	139.00	300	120.00	-0.79	0.01	0	0.001	PVC
1181	P-718	J-463	J-400	489.00	300	120.00	0.31	0	0	0	PVC
1185	P-722	J-607	J-463	437.00	300	120.00	2.16	0.03	0.003	0.006	PVC
1186	P-723	J-418	J-495	222.00	600	120.00	4.92	0.02	0	0.001	PVC
1190	P-727	J-514	J-417	673.00	300	120.00	-2.97	0.04	0.004	0.011	PVC
1191	P-728	J-402	J-509	260.00	300	120.00	15.33	0.22	0.15	0.231	PVC
1192	P-729	J-509	J-412	472.00	400	120.00	12.86	0.1	0.01	0.041	PVC
1203	P-735	J-449	J-515	810.00	250	120.00	1.24	0.03	0.002	0.005	PVC
1206	P-737	J-425	J-516	666.00	300	120.00	-1.85	0.03	0.001	0.005	PVC
1211	P-740	J-424	J-518	0.00	300	120.00	0.00	0	0	0	PVC
1213	P-741	J-390	J-519	897.00	400	120.00	0.34	0	0	0	PVC
1216	P-743	J-373	J-520	0.00	200	120.00	0.00	0	0	0	PVC
1218	P-744	J-348	J-521	448.00	200	120.00	0.24	0.01	0	0.001	PVC
1219	P-745	J-521	J-349	448.00	200	120.00	0.24	0.01	0	0.001	PVC
1222	P-746	J-521	J-523	0.00	200	120.00	0.00	0	0	0	PVC
1224	P-747	J-349	J-524	0.00	250	120.00	0.00	0	0	0	PVC
1226	P-748	J-351	J-525	0.00	200	120.00	0.00	0	0	0	PVC
1248	P-754	J-495	J-529	560.00	600	120.00	2.61	0.01	0	0.001	PVC
1251	P-756	J-529	J-530	0.00	600	120.00	2.43	0.01	0	0	PVC
1253	P-757	J-530	J-531	0.00	600	120.00	2.43	0.01	0	0	PVC
1255	P-758	J-531	J-532	0.00	600	120.00	2.05	0.01	0	0	PVC
1256	P-759	J-532	J-390	0.00	600	120.00	2.05	0.01	0	0	PVC
1257	P-760	J-390	J-495	0	600	120	-2.31	0.01	0	0	PVC
1262	P-762	PRV-A	J-535	185	300	120	6.83	0.1	0.004	0.052	PVC
1263	P-763	J-535	Panattoni	185	300	120	3.44	0.05	0.003	0.015	PVC
1275	P-770	J-536	J-540	0	300	120	0	0	0	0	PVC
1277	P-771	J-541	J-536	0	300	120	1.03	0.01	0	0.002	PVC
1280	P-773	J-542	PRV-A	0	300	120	6.83	0.1	0.005	0.052	PVC
1287	P-778	J-547	J-541	0	300	120	1.03	0.01	0.001	0.002	PVC
1294	P-782	J-536	J-547	0	300	120	-1.45	0.02	0.001	0.003	PVC
1295	P-783	J-547	J-542	0	350	120	-2.48	0.03	0.001	0.004	PVC
1304	P-789	J-1	J-550	0	350	120	1.16	0.01	0	0.001	PVC
1309	P-792	J-82	J-552	0	200	120	0.19	0.01	0	0.001	PVC
1311	P-793	J-345	J-553	288	200	120	0.22	0.01	0	0.001	PVC
1312	P-794	J-553	J-435	288	200	120	0.22	0.01	0	0	PVC
1314	P-795	J-197	J-554	247	300	120	-1.71	0.02	0.001	0.004	PVC
1315	P-796	J-554	J-200	247	300	120	-2.17	0.03	0.001	0.007	PVC
1316	P-797	J-261	J-554	0	200	120	-0.46	0.01	0.002	0.002	PVC
1318	P-798	J-261	J-555	401	300	120	-0.04	0	0	0	PVC
1319	P-799	J-555	J-196	401	300	120	-1.44	0.02	0.001	0.003	PVC
1324	P-801	J-555	J-558	0	200	120	0	0	0	0	PVC
1325	P-802	J-558	J-556	0	200	120	0	0	0	0	PVC
1326	P-803	J-557	J-558	0	200	120	0	0	0	0	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1331	P-806	J-168	J-560	1,219	350	120	-1.31	0.01	0.001	0.001	PVC
1334	P-808	J-246	J-561	359	322	120	-26.24	0.32	0.081	0.444	HDPE
1335	P-809	J-561	J-278	359	300	120	-26.24	0.37	0.107	0.625	PVC
1337	P-810	J-277	J-562	362	300	120	1.43	0.02	0.001	0.003	PVC
1338	P-811	J-562	J-451	362	300	120	1.41	0.02	0	0.003	PVC
1340	P-812	J-451	J-563	0	300	120	1.34	0.02	0.001	0.002	PVC
1343	P-814	J-563	J-564	0	300	120	1.07	0.02	0.001	0.002	PVC
1344	P-815	J-564	J-167	0	300	120	1.07	0.02	0	0.002	PVC
1346	P-816	J-275	J-565	618	300	120	0.54	0.01	0	0.001	PVC
1347	P-817	J-565	J-180 (Dummy)	618	300	120	1.84	0.03	0.002	0.004	PVC
1349	P-818	J-275	J-566	785	300	120	-0.71	0.01	0	0.001	PVC
1350	P-819	J-614	J-388	785	300	120	-2.56	0.04	0.005	0.008	PVC
1352	P-820	J-566	J-567	0	300	120	0.01	0	0	0	PVC
1354	P-821	J-262	J-568	797	300	120	-1.39	0.02	0.001	0.003	PVC
1355	P-822	J-568	J-449	797	300	120	-1.53	0.02	0.001	0.003	PVC
1357	P-823	Panattoni	J-569	726	300	120	3.3	0.05	0.001	0.013	PVC
1361	P-826	J-570	J-464	726	300	120	3.3	0.05	0.003	0.013	PVC
1364	P-828	J-571	J-570	726	300	120	3.3	0.05	0.001	0.014	PVC
1368	P-830	J-573	Supreme Steel	1,001	400	120	2.08	0.02	0	0.002	PVC
1374	P-834	J-575	J-369	589	300	120	-0.12	0	0	0	PVC
1376	P-835	J-424	J-576	899	400	120	5.7	0.05	0.002	0.009	PVC
1386	P-837	J-454	J-577	0	300	120	0.57	0.01	0	0	PVC
1388	P-838	J-569	J-578	726	300	120	3.3	0.05	0.003	0.013	PVC
1389	P-839	J-578	J-571	726	300	120	3.3	0.05	0.001	0.013	PVC
1391	P-840	J-497	J-579	41	300	120	1.11	0.02	0	0.002	PVC
1392	P-841	J-579	J-498	41	300	120	0	0	0	0	PVC
1396	P-842	J-579	J-582	959	300	120	1.11	0.02	0	0.002	PVC
1406	P-848	J-576	J-586	899	400	120	5.25	0.04	0.002	0.008	PVC
1411	P-851	J-280	J-588	1,451	400	120	19.78	0.16	0.044	0.091	PVC
1426	P-857	PRV-15	J-591	974	350	120	-9.34	0.1	0.015	0.043	PVC
1427	P-858	J-591	J-387	974	350	120	-9.05	0.09	0.022	0.041	PVC
1430	P-860	J-592	J-577	0	300	120	-0.57	0.01	0	0	PVC
1450	P-871	J-371	J-601	444	300	120	0.22	0	0	0	PVC
1451	P-872	J-601	J-350	444	300	120	-0.51	0.01	0	0	PVC
1453	P-873	J-347	J-602	818	300	120	0.43	0.01	0	0	HDPE
1454	P-874	J-602	J-252	818	300	120	0.43	0.01	0	0	HDPE
1460	P-878	J-489	J-604	428	300	120	-1.44	0.02	0.001	0.003	PVC
1461	P-879	J-604	J-215	428	300	120	-2.18	0.03	0.001	0.006	PVC
1474	P-884	J-481	J-607	0	300	120	2.16	0.03	0.002	0.006	PVC
1476	P-885	J-508	J-608	503	300	120	5.67	0.08	0.006	0.037	PVC
1479	P-887	J-608	J-609	0	300	120	0	0	0	0	PVC
1481	P-888	J-391 (Dummy)	J-610	624	400	120	3.09	0.02	0.001	0.003	PVC
1482	P-889	J-610	J-508	624	300	120	2.24	0.03	0.001	0.007	PVC
1484	P-890	J-415	J-611	176	300	120	-2.61	0.04	0.001	0.009	PVC
1485	P-891	J-611	J-9	176	300	120	-2.61	0.04	0	0.011	PVC
1491	P-895	J-432	J-447	0	350	120	0	0	0	0	PVC
1493	P-896	J-446	CV-2	1	350	120	0	0	0	0	PVC
1494	P-897	CV-2	J-281	1	350	120	0	0	0	0	PVC
1501	P-901	J-613	J-384	1,219	350	120	-4.3	0.04	0.004	0.01	PVC
1505	P-904	J-565	J-614	0	300	120	-1.31	0.02	0.001	0.003	PVC
1506	P-905	J-614	J-566	0	300	120	0.73	0.01	0	0.001	PVC
1528	P-914	J-619	J-671	1,187	350	120	-6.42	0.07	0.01	0.022	PVC
1549	P-927	J-610	J-439	356	300	120	0.65	0.01	0	0.001	PVC
1553	P-929	J-412	J-626	720	400	120	12.86	0.1	0.021	0.041	PVC
1560	P-933	J-508	J-629	1,206	400	120	-3.42	0.03	0.002	0.004	PVC
1561	P-934	J-629	J-628	1,206	400	120	-3.42	0.03	0.001	0.003	PVC
1574	P-941	J-354	J-535	0	300	120	-3.39	0.05	0.005	0.014	PVC
1580	P-944	J-439	J-624	0	300	120	-1.06	0.01	0.001	0.002	PVC
1605	P-946	J-493	J-632	0	300	120	-3.39	0.05	0.001	0.014	PVC
1606	P-947	J-632	J-355	0	300	120	-3.39	0.05	0.007	0.014	PVC
1613	P-949	J-382	PRV-24	465	200	120	-1.62	0.05	0.01	0.026	PVC
1614	P-950	PRV-24	J-377	465	200	120	-1.62	0.05	0.003	0.027	PVC
1615	P-951	J-376	J-377	0	200	120	1.62	0.05	0.009	0.026	PVC
1620	P-954	J-628	J-634	906	400	120	-3.42	0.03	0.001	0.004	PVC
1626	P-959	J-402	J-635	0	300	120	-15.33	0.22	0.072	0.231	PVC
1682	P-967	J-516	J-642	666	400	120	-1.85	0.01	0	0.001	PVC
1683	P-968	J-642	J-393	666	400	120	-1.85	0.01	0	0.001	PVC
1712	P-971	J-382	J-644	0	200	120	0.77	0.02	0.002	0.007	PVC
1743	P-540(2)	J-647	J-393	848	400	120	-6.46	0.05	0.004	0.011	PVC
1745	P-974	J-647	J-648 (Dummy)	0	300	120	1.7	0.02	0.001	0.004	PVC
1747	P-975	J-648 (Dummy)	J-649	0	300	120	1.02	0.01	0	0.002	PVC
1749	P-540(1)(1)	J-392	J-650	848	400	120	-3.63	0.03	0.001	0.004	PVC
1750	P-540(1)(2)	J-650	J-647	848	400	120	-4.76	0.04	0.001	0.007	PVC
1751	P-976	J-649	J-650	0	300	120	-1.13	0.02	0.001	0.002	PVC
1794	P-691(1)	J-166	J-651	105	350	120	-6.21	0.06	0.002	0.021	PVC
1795	P-691(2)	J-651	PRV-2i	1	76	120	-6.21	1.37	0.035	34.9	PVC
1797	P-438(1)	PRV-2i	J-652	1	76	120	-6.22	1.37	0.035	34.9	PVC
1798	P-438(2)	J-652	J-513	118	350	120	-6.22	0.06	0.002	0.02	PVC
1807	P-531(1)	J-207	J-653	39	300	120	-6.94	0.1	0.002	0.053	PVC
1808	P-531(2)	J-653	PRV-Bi	1	100	120	-6.94	0.88	0.011	11.237	PVC
1810	P-532(1)	PRV-Bi	J-654	1	100	120	-6.94	0.88	0.011	11.237	PVC
1811	P-532(2)	J-654	J-210	144	300	120	-6.94	0.1	0.008	0.053	PVC
1816	P-246(1)	J-190	J-655	43	300	120	-3.27	0.05	0.001	0.012	PVC
1817	P-246(2)	J-655	PRV-1i	1	76	120	-3.27	0.72	0.011	10.641	PVC
1819	P-247(1)	PRV-1i	J-656	1	76	120	-3.27	0.72	0.011	10.567	PVC
1820	P-247(2)	J-656	J-191	166	265	120	-3.27	0.06	0.004	0.025	HDPE
1825	P-605(1)	J-456	J-657	123	200	120	-0.87	0.03	0.001	0.008	PVC
1826	P-605(2)	J-657	PRV-21i	1	76	120	-0.87	0.19	0.001	0.967	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1828	P-606(1)	PRV-21i	J-658	1	76	120	-0.87	0.19	0.001	0.893	PVC
1829	P-606(2)	J-658	J-140	37	200	120	-0.87	0.03	0	0.008	PVC
1834	P-131(1)	J-124	J-659	15	200	120	-0.08	0	0	0	PVC
1835	P-131(2)	J-659	PRV-3i	1	50	120	-0.08	0.04	0	0.074	PVC
1837	P-132(1)	PRV-3i	J-660	1	50	120	-0.08	0.04	0	0.074	PVC
1838	P-132(2)	J-660	J-126	64	200	120	-0.08	0	0	0.001	PVC
1858	P-989	J-83	J-662	0	200	120	0.04	0	0	0	PVC
1860	P-990	J-85	J-663	0	200	120	0.05	0	0	0	PVC
1861	P-991	J-277	J-181	0	300	120	-0.63	0.01	0	0.001	PVC
1883	P-854(1)	J-589	J-666	120	250	120	-1.64	0.03	0.001	0.009	PVC
1884	P-854(2)	J-666	PRV-19i	1	76.2	120	-1.64	0.36	0.003	2.902	PVC
1886	P-680(1)	PRV-19i	J-667	1	76.2	120	-1.64	0.36	0.003	2.902	PVC
1887	P-680(2)	J-667	J-165	61	300	120	-1.64	0.02	0	0.004	PVC
1931	P-790(1)	J-550	J-668	0	350	120	0.9	0.01	0	0.001	PVC
1932	P-790(2)	J-668	J-454	0	350	120	0.65	0.01	0	0	PVC
1934	P-662(1)	J-388	J-669	44	300	120	-6.28	0.09	0.005	0.044	PVC
1935	P-662(2)	J-669	PRV-15	44	350	120	-9.34	0.1	0.009	0.044	PVC
1937	P-995	J-169	J-670	0	250	120	0.57	0.01	0.001	0.001	PVC
1939	P-844(1)	J-387	J-671	0	350	120	8.83	0.09	0.019	0.039	PVC
1940	P-844(2)	J-671	J-584	0	350	120	0.43	0	0	0	PVC
1942	P-913(1)	J-386	J-672	1,187	350	120	-8.37	0.09	0.015	0.036	PVC
1945	P-955(1)	J-634	J-673	906	350	120	-0.41	0	0	0	PVC
1948	P-996	J-674	J-672	0	350	120	4.02	0.04	0.003	0.009	PVC
1950	P-831(1)	J-481	J-675	1,001	400	120	3.25	0.03	0.001	0.003	PVC
1951	P-831(2)	J-675	J-574	1,001	400	120	2.74	0.02	0	0.002	PVC
1953	P-886(1)	J-608	J-676	503	400	120	5.67	0.05	0.001	0.009	PVC
1954	P-886(2)	J-676	J-481	503	400	120	5.52	0.04	0.001	0.009	PVC
1960	P-955(2)(1)	J-673	J-681	906	350	120	-0.75	0.01	0	0.001	PVC
1962	P-997	J-678	J-677	0	300	120	-0.75	0.01	0	0.001	PVC
1963	P-998	J-678	J-679	0	300	120	0.75	0.01	0	0.001	PVC
1964	P-999	J-681	J-679	0	350	120	-0.75	0.01	0	0	PVC
1966	P-490(1)	J-253	J-682	280	200	120	0.41	0.01	0	0.002	PVC
1967	P-490(2)	J-682	J-371	280	200	120	0.22	0.01	0	0.001	PVC
1973	P-1000	J-683	J-474	0	300	120	-0.96	0.01	0	0.001	PVC
1975	P-627(1)	J-492	J-685	233	300	120	0.01	0	0	0	PVC
1976	P-627(2)	J-685	J-493	233	300	120	-1.11	0.02	0	0.002	PVC
1978	P-734(2)(1)	J-684	J-686	669	300	120	-0.43	0.01	0	0	PVC
1979	P-734(2)(2)	J-686	J-493	669	300	120	-0.99	0.01	0	0.001	PVC
1981	P-833(1)	J-508	J-687	589	300	120	-0.02	0	0	0	PVC
1982	P-833(2)	J-687	J-575	589	300	120	-0.12	0	0	0	PVC
1984	P-725(1)	J-9	J-688	642	300	120	-2.77	0.04	0.002	0.01	PVC
1985	P-725(2)	J-688	J-514	642	300	120	-2.92	0.04	0.005	0.011	PVC
1987	P-849(1)	J-586	J-689	899	400	120	5.22	0.04	0.001	0.007	PVC
1988	P-849(2)	J-689	J-391 (Dummy)	899	400	120	4.82	0.04	0.002	0.007	PVC
1990	P-428(1)	J-81	J-690	1,571	250	120	-0.73	0.01	0.001	0.002	PVC
1991	P-428(2)	J-690	J-510	1,571	250	120	-1.1	0.02	0.001	0.004	PVC
1993	P-853(1)	J-372	J-691	581	250	120	-1.1	0.02	0.001	0.005	PVC
1994	P-853(2)	J-691	J-589	581	250	120	-1.64	0.03	0.002	0.009	PVC
1996	P-286(1)	J-256	J-692	219	200	120	-0.06	0	0	0	HDPE
1997	P-286(2)	J-692	J-257	219	200	120	-0.25	0.01	0	0.001	HDPE
1999	P-76(1)	J-71	J-693	166	200	120	0.06	0	0	0	PVC
2000	P-76(2)	J-693	J-72	166	200	120	0.03	0	0	0	PVC
2003	P-988(2)	J-694	J-200	0	200	120	0.28	0.01	0	0.001	PVC
2005	P-988(1)(1)	J-515	J-695	0	200	120	1.2	0.04	0.002	0.015	PVC
2006	P-988(1)(2)	J-695	J-694	0	200	120	0.7	0.02	0.001	0.005	PVC
2010	P-956(1)	J-392	J-697	0	400	120	3.62	0.03	0.001	0.004	PVC
2011	P-956(2)	J-697	J-634	0	400	120	3	0.02	0.001	0.003	PVC
2013	P-832(1)	J-574	J-698	1,001	400	120	2.24	0.02	0.001	0.002	PVC
2014	P-832(2)	J-698	J-573	1,001	400	120	2.13	0.02	0	0.001	PVC
2016	P-571(1)	J-390	J-699	201	400	120	3.93	0.03	0.001	0.005	PVC
2017	P-571(2)	J-699	J-424	201	400	120	3.87	0.03	0.001	0.005	PVC
2026	P-948(2)	J-701	J-497	0	300	120	1.29	0.02	0	0.002	PVC
2028	P-957(1)	J-588	J-702	1,451	400	120	19.38	0.15	0.012	0.088	PVC
2029	P-957(2)	J-702	J-635	1,451	300	120	19.38	0.27	0.221	0.357	PVC
2049	P-900(1)	J-560	J-709	1,219	350	120	-1.43	0.01	0	0.001	PVC
2050	P-900(2)	J-709	J-613	1,219	350	120	-1.43	0.01	0	0.001	PVC
2056	P-1007	J-670	J-389	0	250	120	-0.37	0.01	0	0.001	PVC
2057	P-1008	J-624	J-391 (Dummy)	0	300	120	-1.06	0.01	0.001	0.002	PVC
2058	P-1009	J-677	J-649	0	300	120	-2.15	0.03	0.001	0.006	PVC
2065	P-913(2)(1)	J-672	J-713	1,187	350	120	-4.35	0.05	0.003	0.011	PVC
2066	P-913(2)(2)	J-713	J-619	1,187	350	120	-4.35	0.05	0.004	0.011	PVC
2072	P-1016(1)	J-584	J-715	0	300	120	0.43	0.01	0	0	PVC
2073	P-1016(2)	J-715	J-696	0	300	120	0.43	0.01	0	0	PVC
2094	P-1018	J-387	J-718	0	350	120	8.17	0.08	0.022	0.034	PVC
2095	P-1019	J-718	J-591	0	350	120	0.29	0	0	0	PVC
2096	P-1020	J-718	J-674	0	350	120	7.88	0.08	0.011	0.032	PVC
2144	P-687(2)	J-719	J-626	807	400	120	-12.86	0.1	0.013	0.041	PVC
2146	P-687(1)(1)	J-393	J-720	807	400	120	-12.86	0.1	0.01	0.041	PVC
2147	P-687(1)(2)	J-720	J-719	807	400	120	-12.86	0.1	0.009	0.041	PVC
2149	P-1029	J-111	J-721	0	200	120	0	0	0	0	PVC
2150	P-1030	J-168	J-167	0	350	120	3.06	0.03	0.002	0.006	PVC
2154	P-1032	J-555	J-723	0	300	120	1.4	0.02	0	0.003	PVC
2156	P-1033	J-723	J-724	0	300	120	1.4	0.02	0	0.003	PVC
2158	P-1034	J-724	J-725	0	300	120	1.4	0.02	0.001	0.003	PVC
2159	P-1035	J-725	J-192	0	300	120	1.4	0.02	0.001	0.003	PVC

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
185	J-160	TRUE	60	201.79	60	201.79	45.9	21.8	J-480
186	J-222	TRUE	230	350	230	350	36	30.6	J-317
187	J-162	TRUE	60	222.44	60	222.44	35.7	21.8	J-480
188	J-138	TRUE	60	93.1	60	93.1	21.8	39.6	J-346
189	J-192	TRUE	230	350	230	350	44.4	35.4	J-584
190	J-119	TRUE	60	115.36	60	115.36	28.8	21.8	J-111
191	J-134	TRUE	60	137.94	60.06	138	21.8	23.9	J-346
192	J-67	TRUE	230	350	230.01	350.01	42.5	37.5	J-697
193	J-38	TRUE	230	350	230.01	350.01	43.9	36.5	J-697
194	J-41	TRUE	230	350	230.03	350.03	45.1	36.2	J-697
195	J-144	TRUE	60	89.76	60	89.76	21.8	28.3	J-143
196	J-37	TRUE	230	350	230.01	350.01	44.8	36.5	J-697
197	J-472	TRUE	230	350	230	350	50.4	35.1	J-229
198	J-201	TRUE	230	350	230	350	56.7	33.1	J-584
199	J-91	TRUE	60	152.31	60	152.31	21.8	25.8	J-90
200	J-103	TRUE	60	109.11	60.07	109.17	21.8	30.1	J-111
201	J-53	TRUE	230	350	230.06	350.06	44.7	36.9	J-697
202	J-40	TRUE	230	350	230	350	48	36.5	J-697
203	J-107	TRUE	60	118.25	60	118.25	28.6	21.8	J-111
204	J-212	TRUE	230	278.83	230	278.83	21.8	25.3	J-211
205	J-197	TRUE	230	350	230	350	49.7	34.8	J-584
206	J-159	TRUE	60	186.38	60	186.38	44.3	21.8	J-480
207	J-163	TRUE	60	237	60	237	36	21.8	J-480
208	J-92	TRUE	60	128.42	60.05	128.47	21.8	39.5	J-372
209	J-90	TRUE	60	153.08	60.1	153.18	21.8	25.8	J-483
210	J-111	TRUE	60	99.75	60.09	99.84	21.8	21.8	J-721
211	J-177	TRUE	60	155.06	60	155.06	23.1	21.8	J-170
212	J-471	TRUE	230	350	230	350	48.7	34.8	J-229
213	J-233	TRUE	60	125.36	60.08	125.44	21.8	28.8	J-346
214	8 (Dun	TRUE	230	350	231.36	351.36	32.8	31.8	J-229
215	J-1	TRUE	230	350	230.36	350.36	35	28.6	J-463
216	J-174	TRUE	60	180.84	60.07	180.91	22.3	21.8	J-170
218	J-131	TRUE	60	145.05	60.08	145.12	31.5	21.8	J-346
219	J-100	TRUE	60	118.43	60.11	118.54	22.5	21.8	J-111
220	J-75	TRUE	60	250.89	60	250.89	37.7	21.8	J-372
221	J-60	TRUE	230	350	230	350	46.7	36.7	J-697
222	J-217	TRUE	230	350	230	350	43.1	37.7	J-697
223	J-146	TRUE	60	147.67	60	147.67	30.8	21.8	J-480
224	J-6	TRUE	230	318.9	230.02	318.92	21.8	38.8	J-7
225	J-169	TRUE	230	350	230	350	33.5	28.6	J-584
226	J-4	TRUE	230	350	230	350	34.2	32.5	J-697
227	J-27	TRUE	230	350	230.05	350.05	41	35.2	J-697
228	J-158	TRUE	60	162.15	60	162.15	35	21.8	J-480
229	J-14	TRUE	230	350	230	350	39.4	34.5	J-697
230	J-105	TRUE	60	116.83	60.1	116.93	21.8	31.7	J-346
231	J-261	TRUE	230	350	230	350	49.4	35.5	J-584
232	J-51	TRUE	230	350	230.13	350.13	49.5	36.6	J-697
233	J-183	TRUE	230	350	230	350	56.6	32	J-584
234	J-106	TRUE	60	118.6	60.05	118.65	30.3	21.8	J-111
235	J-244	TRUE	230	350	230	350	50.8	36.4	J-697
236	J-185	TRUE	230	350	230.23	350.23	51.9	31.7	J-584
237	J-205	TRUE	230	350	230	350	40.7	33.3	J-584
238	J-88	TRUE	60	149.73	60.09	149.82	24.9	21.8	J-483
239	J-87	TRUE	60	156	60	156	21.8	22.7	J-483
240	J-104	TRUE	60	134.78	60.09	134.88	22	21.8	J-111
241	J-246	TRUE	230	350	230	350	41.8	37.9	J-697
242	J-232	TRUE	60	135.59	60	135.59	30.2	21.8	J-346
243	J-30	TRUE	230	350	230.04	350.04	42.5	35.5	J-697

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244	J-9	TRUE	230	350	230.03	350.03	41.7	33.1	J-697
245	J-182	TRUE	230	350	230.08	350.08	52.8	31.4	J-584
246	J-203	TRUE	230	350	230.14	350.14	46.2	33.2	J-584
247	J-65	TRUE	230	350	230	350	39.6	37.5	J-697
248	J-113	TRUE	60	125.98	60	125.98	27.1	21.8	J-111
249	J-126	TRUE	60	139.57	60.09	139.66	21.8	22.1	J-346
251	J-175	TRUE	60	159.92	60.04	159.96	22.4	21.8	J-170
252	J-108	TRUE	60	117.73	60.03	117.75	27.9	21.8	J-111
253	J-152	TRUE	60	115.18	60.08	115.26	32.6	21.8	J-480
254	J-200	TRUE	230	350	230	350	50.2	34.2	J-584
255	J-36	TRUE	230	350	230	350	47.3	36.5	J-697
256	J-143	TRUE	60	95.43	60	95.43	21.8	22	J-144
257	J-81	TRUE	60	151.81	60	151.81	41.5	21.8	J-372
258	J-12	TRUE	230	350	230	350	35.4	34.2	J-697
259	J-226	TRUE	230	350	230.04	350.04	29.2	29.5	J-317
260	J-45	TRUE	230	350	230.04	350.04	41.8	35.7	J-697
261	J-17	TRUE	230	350	230	350	39.9	34.1	J-697
262	J-206	TRUE	230	350	230	350	37.6	33.8	J-584
263	J-115	TRUE	60	121.01	60.03	121.05	27.8	21.8	J-111
264	J-150	TRUE	60	119.02	60	119.02	31.4	21.8	J-480
265	J-77	TRUE	60	219.55	60	219.55	44.5	21.8	J-372
266	J-18	TRUE	230	350	230	350	45.2	34	J-697
267	J-141	TRUE	60	101.58	60	101.58	22	21.8	J-143
268	J-8	TRUE	230	350	230.07	350.07	46.2	33.9	J-697
270	J-118	TRUE	60	113.88	60.11	113.99	21.8	24.9	J-111
271	J-34	TRUE	230	350	230	350	44.5	36.2	J-697
272	J-263	TRUE	230	350	230	350	48	35.9	J-584
273	J-135	TRUE	60	138.99	60.12	139.11	30.7	21.8	J-346
274	J-121	TRUE	60	135.06	60.03	135.09	21.8	24.7	J-346
275	J-181	TRUE	230	350	230.01	350.01	51.1	31	J-584
276	J-264	TRUE	230	350	231.22	351.22	44.9	35.4	J-584
277	J-220	TRUE	230	350	230.16	350.16	41.9	32.1	J-584
278	J-252	TRUE	60	189.36	60.03	189.39	21.8	23.5	J-253
279	J-142	TRUE	60	91.8	60	91.8	21.8	32.1	J-143
280	J-109	TRUE	60	116.65	60.05	116.7	29.2	21.8	J-111
281	J-129	TRUE	60	137.2	60.11	137.31	21.8	23.2	J-140
282	J-39	TRUE	230	350	230	350	44.1	36.5	J-697
283	J-164	TRUE	60	257.86	60	257.86	34.9	21.8	J-480
285	J-219	TRUE	230	350	230.05	350.05	46.7	32	J-584
286	J-469	TRUE	230	350	230	350	36.5	32.4	J-229
287	J-256	TRUE	60	96.17	60.06	96.23	21.8	21.8	J-499
288	J-120	TRUE	60	129.45	60	129.45	22.7	21.8	J-111
289	J-230	TRUE	230	350	230	350	25.7	23.7	J-229
290	J-130	TRUE	60	144.38	60.05	144.43	26	21.8	J-346
291	J-117	TRUE	60	115.21	60.07	115.28	21.8	22.8	J-118
292	J-223	TRUE	230	350	230.01	350.01	33.5	29.7	J-317
293	J-218	TRUE	230	350	230	350	42.4	37.8	J-697
294	J-46	TRUE	230	350	230	350	40.6	35.6	J-697
295	J-2	TRUE	230	350	230.22	350.22	33.4	31.4	J-463
296	J-26	TRUE	230	350	230.01	350.01	43.3	35.1	J-697
297	J-189	TRUE	60	295.92	60.08	296	39.4	21.8	J-372
298	J-211	TRUE	230	286.94	230	286.94	21.8	21.9	J-212
299	J-23	TRUE	230	350	230.02	350.02	40.7	35	J-697
301	J-59	TRUE	230	350	231.22	351.22	44.1	37	J-697
302	J-156	TRUE	60	117.15	60	117.15	31.2	21.8	J-480
303	J-199	TRUE	230	350	230.01	350.01	30.9	34.8	J-584
305	J-148	TRUE	60	132.37	60.01	132.39	29.7	21.8	J-480
306	J-132	TRUE	60	143.95	60.05	144	24	21.8	J-346

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307	J-19	TRUE	230	350	230	350	43.5	34.3	J-697
308	J-83	TRUE	60	191.88	60	191.88	22.6	21.8	J-372
309	J-139	TRUE	60	97.63	60.07	97.69	21.8	38.2	J-346
310	J-133	TRUE	60	138.95	60.05	139	24.2	21.8	J-233
311	J-96	TRUE	60	129.28	60.06	129.34	31.3	21.8	J-111
312	J-204	TRUE	230	350	230	350	45.4	33.2	J-584
313	J-52	TRUE	230	350	230	350	47.1	36.7	J-697
314	J-55	TRUE	230	350	230.06	350.06	43.7	37.3	J-697
315	J-74	TRUE	60	272.7	60	272.7	21.8	22.2	J-372
316	J-253	TRUE	60	184.83	60.01	184.84	21.8	24.7	J-682
317	J-225	TRUE	230	340.54	230	340.54	24.4	21.8	J-317
318	J-186	TRUE	230	350	230	350	56.1	31.6	J-584
319	J-66	TRUE	230	350	230	350	44.8	37.6	J-697
320	J-227	TRUE	230	350	231.08	351.08	24.7	24.9	J-228
321	J-54	TRUE	230	350	230.01	350.01	43.2	37	J-697
322	J-470	TRUE	230	350	230	350	42.5	33.8	J-229
323	J-165	TRUE	60	293.24	60	293.24	32.6	21.8	J-480
324	J-32	TRUE	230	350	230.06	350.06	46.1	35.9	J-697
325	J-42	TRUE	230	350	230.03	350.03	44.4	36.1	J-697
326	J-178	TRUE	230	350	230.13	350.13	42.4	29.6	J-584
327	J-93	TRUE	60	130.11	60.11	130.21	21.8	23.6	J-111
328	J-97	TRUE	60	125.88	60.06	125.94	35.9	21.8	J-111
329	J-122	TRUE	60	140.14	60.04	140.17	21.8	21.9	J-121
330	J-84	TRUE	60	183.56	60.02	183.58	21.8	23.9	J-85
331	J-62	TRUE	230	350	230	350	35.8	37.4	J-697
332	J-29	TRUE	230	350	230.01	350.01	40.8	35.4	J-697
333	J-94	TRUE	60	132.21	60	132.21	28.7	21.8	J-111
334	J-72	TRUE	60	135.14	60.06	135.2	21.8	31.6	J-693
335	J-188	TRUE	230	350	230	350	55.1	31.5	J-584
336	J-231	TRUE	60	233.7	60	233.7	21.8	31.4	J-209
337	J-229	TRUE	230	320.76	230.02	320.78	21.8	35.6	J-230
338	J-466	TRUE	230	350	230	350	31.8	30.3	J-465
339	J-10	TRUE	230	350	230.11	350.11	33.4	33.8	J-697
340	J-95	TRUE	60	130.84	60.02	130.86	29.8	21.8	J-111
341	5 (Dum	TRUE	230	350	231.36	351.36	39.3	35	J-697
342	J-78	TRUE	60	212.73	60	212.73	45.5	21.8	J-372
343	J-99	TRUE	60	119.52	60.13	119.65	32.1	21.8	J-111
345	J-7	TRUE	230	350	230	350	29.2	28.8	J-6
346	J-196	TRUE	230	350	230.1	350.1	50.6	34.9	J-584
347	J-208	TRUE	230	350	230.01	350.01	31.7	33.3	J-229
348	J-68	TRUE	60	198.59	60.08	198.66	21.8	37.3	J-372
349	J-73	TRUE	60	273.81	60.12	273.93	21.8	23.7	J-372
350	J-79	TRUE	60	187.39	60	187.39	44.8	21.8	J-372
351	J-464	TRUE	230	350	230	350	30	29.1	J-229
352	J-221	TRUE	230	350	230	350	37.7	31.4	J-317
353	J-63	TRUE	230	350	230.07	350.07	35.5	37.5	J-697
354	J-48	TRUE	230	350	230	350	41.2	35.7	J-697
355	J-173	TRUE	60	208.7	60.12	208.82	24.6	21.8	J-170
356	J-136	TRUE	60	139.75	60	139.75	24.1	21.8	J-346
357	J-255	TRUE	60	230.97	60.04	231.01	31.7	21.8	J-350
358	J-137	TRUE	60	136.12	60.09	136.21	21.8	24.3	J-346
359	J-44	TRUE	230	350	230	350	44.6	35.8	J-697
363	J-69	TRUE	60	209.68	60.08	209.77	21.8	28.7	J-68
364	J-461	TRUE	230	293.31	230.05	293.36	21.8	25.8	J-541
365	J-50	TRUE	230	350	230	350	40.7	35.7	J-697
366	J-58	TRUE	230	350	230.02	350.02	44.9	37.2	J-697
367	J-61	TRUE	230	350	230.02	350.02	37.7	37.4	J-697
368	6 (Dum	TRUE	230	350	231.36	351.36	42	37.3	J-697

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369	J-47	TRUE	230	350	230.01	350.01	41.1	35.3	J-697
370	J-176	TRUE	60	154.1	60.26	154.36	21.8	24.1	J-170
371	J-128	TRUE	60	118.24	60.08	118.31	22.9	21.8	J-138
372	J-151	TRUE	60	117.79	60.04	117.82	32.5	21.8	J-480
373	J-13	TRUE	230	350	230.01	350.01	40.2	34.4	J-697
374	J-33	TRUE	230	350	230.01	350.01	45.1	36.1	J-697
376	J-123	TRUE	60	142.17	60.01	142.18	21.9	21.8	J-346
378	J-21	TRUE	230	350	230.08	350.08	40.3	34.6	J-697
379	30 (Dum	TRUE	230	350	231.36	351.36	48.5	30.5	J-584
380	J-202	TRUE	230	350	230	350	55.2	32.7	J-584
381	J-168	TRUE	230	350	230	350	44.2	28.9	J-584
382	J-49	TRUE	230	350	230.07	350.07	39.5	35.7	J-697
383	J-110	TRUE	60	107.39	60.09	107.47	24.8	21.8	J-111
384	J-102	TRUE	60	115.51	60.05	115.56	23.4	21.8	J-103
385	J-31	TRUE	230	350	230	350	45.8	35.7	J-697
386	J-147	TRUE	60	147.81	60	147.81	31.8	21.8	J-480
387	J-28	TRUE	230	350	230	350	40.5	35.4	J-697
388	J-24	TRUE	230	350	230.01	350.01	38.2	35	J-697
389	J-465	TRUE	230	350	230	350	28.6	29.6	J-229
390	J-154	TRUE	60	98.63	60.06	98.69	30.5	21.8	J-480
391	J-89	TRUE	60	152.33	60.03	152.36	23	21.8	J-483
392	J-153	TRUE	60	103.86	60.05	103.91	31.8	21.8	J-480
394	J-98	TRUE	60	121.43	60.06	121.49	34.2	21.8	J-111
395	J-259	TRUE	230	350	230.23	350.23	32	32.5	J-461
396	J-3	TRUE	230	350	230.18	350.18	33	32.4	J-697
397	J-85	TRUE	60	177.24	60.76	178	21.8	25.9	J-86
398	J-71	TRUE	60	171.71	60.06	171.76	21.8	21.8	J-72
399	J-116	TRUE	60	115.15	60.07	115.22	21.8	23.7	J-103
400	J-167	TRUE	230	350	230	350	42.8	29.2	J-584
401	J-70	TRUE	60	232.82	60.06	232.88	21.8	21.8	J-72
402	J-43	TRUE	230	350	230	350	44.2	35.9	J-697
403	J-179	TRUE	230	350	230	350	45	30.1	J-584
406	J-224	TRUE	230	350	230.16	350.16	33.9	28.2	J-317
407	J-35	TRUE	230	350	230	350	50.8	36.4	J-697
408	J-145	TRUE	60	145.16	60	145.16	32.4	21.8	J-346
409	J-170	TRUE	60	129.91	60	129.91	21.8	32.4	J-177
410	J-228	TRUE	230	349.86	230.1	349.96	21.8	27.6	J-227
411	J-15	TRUE	230	350	230.12	350.12	39.5	34.7	J-697
412	eson Zo	TRUE	230	350	230.16	350.16	36.6	37.5	J-697
413	J-262	TRUE	230	350	230	350	49.4	35.7	J-229
414	J-76	TRUE	60	236.11	60	236.11	46.6	21.8	J-372
415	J-82	TRUE	60	182.42	60	182.42	36.8	21.8	J-372
416	J-187	TRUE	230	350	230.04	350.04	55.5	31.6	J-584
417	J-124	TRUE	60	142.02	60	142.02	24.8	21.8	J-346
418	J-86	TRUE	60	166.42	60.05	166.47	21.8	22.6	J-92
419	J-101	TRUE	60	116.62	60.09	116.7	21.8	23.1	J-111
420	J-140	TRUE	60	108	60.04	108.04	21.8	35.1	J-346
422	J-198	TRUE	230	350	230.44	350.44	37.8	34.8	J-584
423	J-248	TRUE	230	289.33	230	289.33	21.8	22.8	J-211
424	J-247	TRUE	230	303.31	230	303.31	22.1	21.8	J-248
426	J-5	TRUE	230	350	230	350	34.8	32.7	J-697
427	J-171	TRUE	60	222.87	60.07	222.93	21.8	23.1	J-170
428	J-22	TRUE	230	350	230.03	350.03	42.3	35	J-697
429	J-16	TRUE	230	350	230	350	40.2	34.8	J-697
430	J-184	TRUE	230	350	230.07	350.07	53.5	31.8	J-584
431	J-57	TRUE	230	350	230	350	41.9	37.3	J-697
432	J-11	TRUE	230	350	230.14	350.14	31.3	34	J-697
433	J-467	TRUE	230	350	230.25	350.25	33.5	31.2	J-229

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434	J-127	TRUE	60	119.47	60.06	119.53	21.8	30.7	J-346
435	J-20	TRUE	230	350	230.01	350.01	39.7	34.5	J-697
436	J-172	TRUE	60	214.25	60.07	214.32	21.8	23.2	J-170
437	J-157	TRUE	60	158.79	60.03	158.82	33.5	21.8	J-480
438	J-161	TRUE	60	209.88	60	209.88	39.9	21.8	J-480
439	J-114	TRUE	60	125.95	60.01	125.95	25.5	21.8	J-111
440	J-149	TRUE	60	120.38	60.03	120.41	31.6	21.8	J-480
441	akesho	TRUE	60	125.99	60.1	126.09	30.6	21.8	J-111
442	J-257	TRUE	60	112.57	60.02	112.59	21.8	21.8	J-499
443	J-155	TRUE	60	91.84	60.05	91.88	29.1	21.8	J-480
444	0 (Dum	TRUE	60	158.62	61.36	159.98	41.1	21.8	J-372
445	J-125	TRUE	60	224.81	60.08	224.89	21.8	21.8	J-209
446	J-193	TRUE	60	289.94	60.06	290	27.5	21.8	J-194
447	J-194	TRUE	60	145.18	60.06	145.24	21.8	43.6	J-372
448	J-209	TRUE	60	151.22	60.07	151.29	21.8	42.2	J-372
449	J-214	TRUE	60	170.56	60	170.56	21.8	40.3	J-372
450	J-215	TRUE	60	273.14	60	273.14	23.2	21.8	J-491
451	J-216	TRUE	230	262.88	230	262.88	21.8	50.4	J-372
452	J-274	TRUE	60	289.06	60	289.06	29.4	21.8	J-194
453	J-275	TRUE	230	350	230.01	350.01	24.5	25.3	J-566
454	J-276	TRUE	230	350	230.02	350.02	56.3	31.3	J-584
455	J-277	TRUE	230	350	230.01	350.01	53.4	31	J-584
456	J-278	TRUE	230	350	230	350	39.3	38.9	J-635
457	9 (Dum	TRUE	230	350	231.36	351.36	37.1	38.1	J-635
458	J-280	TRUE	230	350	230.42	350.42	39.1	36.2	J-635
460	J-317	TRUE	230	300.29	231.36	301.65	21.8	35.3	J-225
461	reme S	TRUE	230	350	230	350	29.8	26.1	J-463
462	J-369	TRUE	230	350	230.05	350.05	35.1	32.4	J-697
463	J-413	TRUE	60	115.43	60	115.43	21.8	22.9	J-111
464	J-414	TRUE	230	350	230.01	350.01	46.2	36.2	J-229
465	J-415	TRUE	230	350	230	350	41.4	33.5	J-697
466	J-416	TRUE	230	350	230	350	48.3	36	J-229
467	J-417	TRUE	230	350	230	350	53.8	35.6	J-697
468	J-418	TRUE	230	350	230	350	53.7	35.5	J-697
469	J-426	TRUE	230	251.44	230	251.44	21.8	50.4	J-372
470	J-427	TRUE	230	267.16	230.19	267.35	21.8	50.4	J-372
472	J-433	TRUE	230	350	230.02	350.02	38.2	36.6	J-697
473	J-455	TRUE	60	127.19	60.02	127.2	29.1	21.8	J-436
474	J-456	TRUE	60	138.95	60	138.95	21.8	21.8	J-137
475	J-457	TRUE	60	134.74	60.03	134.77	23.3	21.8	J-459
476	J-458	TRUE	60	121.69	60.01	121.7	24	21.8	J-459
477	J-459	TRUE	60	114.01	60	114.01	21.8	31.6	J-458
478	J-460	TRUE	60	121.15	60.03	121.18	21.8	24.6	J-380
479	J-462	TRUE	60	135.56	60.01	135.57	21.8	22.9	J-459
480	J-473	TRUE	60	135.15	60	135.15	21.8	23.2	J-111
481	J-474	TRUE	230	350	230	350	34.7	35.3	J-683
482	J-475	TRUE	60	89.91	60	89.91	29.9	21.8	J-480
483	J-476	TRUE	60	87.26	60	87.26	30.5	21.8	J-480
484	J-477	TRUE	60	77.38	60.08	77.45	27.2	21.8	J-480
485	J-478	TRUE	60	71.42	60.03	71.45	21.8	21.8	J-480
486	J-479	TRUE	60	65.65	60	65.65	21.8	21.8	J-480
487	J-480	TRUE	60	61.8	60.03	61.83	21.8	25.2	J-479
488	ntry Sq	TRUE	60	70.03	60.01	70.04	22.6	21.8	J-482
489	J-482	TRUE	60	67.98	60	67.98	21.8	24.5	Country Squire
490	J-483	TRUE	60	134.43	60	134.43	21.8	35.5	J-88
491	J-484	TRUE	60	233.37	60.05	233.42	31	21.8	J-350
492	J-485	TRUE	60	233.27	60.02	233.29	31.5	21.8	J-491
493	reenbri	TRUE	60	232.51	60.08	232.59	32.1	21.8	J-491

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494	J-487	TRUE	60	231.41	60.03	231.44	29.3	21.8	J-491
495	J-488	TRUE	60	230.53	60	230.53	29.3	21.8	J-491
496	J-489	TRUE	60	229.36	60.02	229.38	29.3	21.8	J-491
497	J-490	TRUE	60	219.21	60.32	219.53	26.2	21.8	J-491
498	J-491	TRUE	60	210.41	60	210.41	21.8	25.1	J-353
499	J-492	TRUE	230	350	230.03	350.03	46.2	35.7	J-229
500	J-493	TRUE	230	350	230	350	42.5	36	J-355
501	J-494	TRUE	230	340.02	230	340.02	23.8	21.8	J-496
502	J-496	TRUE	230	309.24	230	309.24	21.8	23.7	J-701
503	J-497	TRUE	230	270.89	230.35	271.24	22.3	21.8	J-579
504	J-498	TRUE	230	244.26	230	244.26	21.8	23.7	J-579
505	J-499	TRUE	60	87.82	60.06	87.88	21.8	31.3	J-256
506	J-500	TRUE	60	237.39	60.05	237.45	21.8	33.4	J-372
507	Panattor	TRUE	230	350	230.28	350.28	27.5	28.4	J-569
508	J-502	TRUE	60	240.41	60.04	240.45	22.9	21.8	J-372
509	J-503	TRUE	60	220.13	60.05	220.19	21.8	24.4	J-372
510	J-504	TRUE	60	207.73	60.06	207.79	21.8	25.2	J-372
511	J-505	TRUE	60	199.83	60.08	199.91	21.8	25.5	J-372
512	J-506	TRUE	60	218.29	60.05	218.34	21.8	21.8	J-507
513	J-507	TRUE	60	160.47	60.06	160.54	21.8	37.6	J-372
514	J-508	TRUE	230	350	230	350	37.6	29.1	J-697
515	J-510	TRUE	60	100.6	60	100.6	34.8	21.8	J-372
516	J-511	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
518	J-338	TRUE	60	131.49	60.05	131.53	24.1	21.8	J-346
519	J-339	TRUE	60	137.25	60.08	137.33	29.8	21.8	J-346
520	J-340	TRUE	60	133.25	60.2	133.44	23.8	21.8	J-346
521	J-341	TRUE	60	121.06	60.06	121.12	21.8	27	J-346
522	J-342	TRUE	60	127.76	60	127.76	28	21.8	J-346
523	J-343	TRUE	60	115.36	60.13	115.49	25.2	21.8	J-346
524	J-344	TRUE	60	107.91	60	107.91	23.9	21.8	J-346
525	J-345	TRUE	60	103	60.09	103.09	23.3	21.8	J-346
526	J-346	TRUE	60	92.49	60	92.49	21.8	29.3	J-345
527	J-347	TRUE	60	214.38	60	214.38	29.7	21.8	J-350
528	J-348	TRUE	60	174.72	60.17	174.9	21.8	29.7	J-521
529	J-349	TRUE	60	184.62	60.06	184.68	21.8	22.7	J-524
530	J-350	TRUE	60	184.56	60	184.56	21.8	23.3	J-601
531	J-351	TRUE	60	185.42	60.79	186.21	21.8	24.2	J-525
532	J-352	TRUE	60	197.07	60	197.07	21.8	23.1	J-351
533	J-353	TRUE	60	195.87	60	195.87	21.8	27.2	J-352
534	J-354	TRUE	230	350	230	350	26.2	29.7	J-355
535	J-355	TRUE	60	350	60	350	23.4	29.8	J-354
549	J-371	TRUE	60	178.01	60	178.01	21.8	23.6	J-601
550	J-372	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
551	J-373	TRUE	60	157.6	60	157.6	21.8	23.6	J-520
552	J-374	TRUE	60	169.99	60.16	170.15	21.8	24.6	J-373
553	J-375	TRUE	60	195.56	60	195.56	21.8	24.2	J-374
554	J-376	TRUE	60	146.54	60	146.54	21.8	34.6	J-377
555	J-377	TRUE	60	116.07	60	116.07	21.8	42.9	J-376
558	J-380	TRUE	60	121.15	60	121.15	23.3	21.8	J-460
559	J-381	TRUE	60	153.8	60	153.8	21.8	23	J-91
560	J-382	TRUE	60	147.73	60	147.73	21.8	30.7	J-644
561	J-384	TRUE	230	350	232	352	25	25.9	J-584
562	J-385	TRUE	230	341.27	236.13	347.41	21.8	27.1	J-584
563	J-386	TRUE	230	257.58	230	257.58	21.8	25.7	J-619
564	J-387	TRUE	230	276.81	230	276.81	23.3	21.8	J-584
565	J-388	TRUE	230	350	230.66	350.66	31.8	27.9	J-584
566	J-389	TRUE	230	266.48	235.37	271.85	21.8	41.3	J-670
567	J-390	TRUE	230	350	230.17	350.17	45.4	34.9	J-697

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568	)1 (Dun	TRUE	230	350	231.36	351.36	34.7	30.9	J-697
569	J-392	TRUE	230	348.62	230.03	348.64	24.5	21.8	J-697
570	J-393	TRUE	230	350	239.08	359.08	34.1	26.4	J-697
577	J-400	TRUE	230	322.29	235.06	327.35	21.8	23.4	J-463
579	J-402	TRUE	230	312.62	230	312.62	21.8	25.9	J-635
588	J-412	TRUE	230	341.77	230	341.77	21.8	25	J-509
593	J-424	TRUE	230	350	230.05	350.05	43.7	32.1	J-697
594	J-425	TRUE	230	350	230	350	33.5	29	J-697
596	J-429	TRUE	60	210.3	60.35	210.66	21.8	24.8	J-480
600	J-435	TRUE	60	108.02	60.52	108.54	21.8	23.2	J-346
601	J-436	TRUE	60	112.41	60	112.41	21.8	26.5	J-346
602	J-437	TRUE	60	139.27	60	139.27	30.9	21.8	J-346
603	J-438	TRUE	60	146.61	60.05	146.66	27.3	21.8	J-346
604	J-439	TRUE	230	347.08	233.42	350.5	21.8	31	J-624
614	J-449	TRUE	230	350	230.42	350.42	31.3	33.8	J-208
615	J-450	TRUE	230	350	230	350	28.9	27	J-463
616	J-451	TRUE	230	350	230.16	350.16	44	30.4	J-584
617	J-452	TRUE	60	107.13	60.14	107.27	21.8	25.9	J-346
618	J-453	TRUE	60	144.66	60.13	144.79	33.8	21.8	J-346
619	J-454	TRUE	230	310.28	230.17	310.45	23.5	21.8	J-592
620	J-463	TRUE	230	294.35	233.71	298.05	21.8	33	J-607
621	J-481	TRUE	230	350	230.23	350.23	33.6	26.8	J-607
623	J-495	TRUE	230	350	230	350	52.9	35.1	J-697
624	J-514	TRUE	230	350	230.09	350.09	37.2	34.8	J-697
625	J-509	TRUE	230	344.34	234.94	349.28	21.8	22.2	J-412
1202	J-515	TRUE	230	296.48	230.09	296.57	21.8	33.8	J-695
1205	J-516	TRUE	230	350	230	350	33.5	27	J-697
1210	J-518	TRUE	230	350	230	350	23.4	32.1	J-697
1212	J-519	TRUE	230	350	230.68	350.68	39.7	34.9	J-697
1215	J-520	TRUE	60	133.2	60	133.2	21.8	31.2	J-373
1217	J-521	TRUE	60	169.07	60	169.07	21.8	23.4	J-523
1221	J-523	TRUE	60	123.22	60	123.22	21.8	45.1	J-372
1223	J-524	TRUE	60	173.52	60	173.52	21.8	27.5	J-349
1225	J-525	TRUE	60	135.92	60	135.92	21.8	42.5	J-351
1247	J-529	TRUE	230	350	230.36	350.36	50.1	35.1	J-697
1250	J-530	TRUE	230	350	230	350	45.5	35.1	J-697
1252	J-531	TRUE	230	350	230.76	350.76	45.4	35	J-697
1254	J-532	TRUE	230	350	230	350	45.4	35	J-697
1261	J-535	TRUE	230	350	230	350	33.3	34.9	J-578
1266	J-536	TRUE	230	243.47	234.96	248.44	21.8	22.2	J-541
1274	J-540	TRUE	230	243.52	230	243.52	22.9	21.8	J-536
1276	J-541	TRUE	230	239.92	230	239.92	21.8	25.7	J-536
1279	J-542	TRUE	230	280.82	230	280.82	22.6	21.8	J-541
1293	J-547	TRUE	230	256.53	230	256.53	23.6	21.8	J-541
1303	J-550	TRUE	230	350	230.51	350.51	23	22	J-592
1308	J-552	TRUE	60	179.5	60.37	179.87	21.8	22.6	J-372
1310	J-553	TRUE	60	106.36	60	106.36	22.2	21.8	J-346
1313	J-554	TRUE	230	350	230	350	49	34.5	J-584
1317	J-555	TRUE	230	350	230	350	48	35.3	J-584
1320	J-556	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1322	J-557	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1323	J-558	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1330	J-560	TRUE	230	350	230.24	350.24	29.1	27.2	J-584
1333	J-561	TRUE	230	350	230	350	40	38.6	J-697
1336	J-562	TRUE	230	350	230.03	350.03	49.8	30.6	J-584
1339	J-563	TRUE	230	350	230.53	350.53	38.2	30.1	J-584
1342	J-564	TRUE	230	350	230	350	38.3	29.6	J-584
1345	J-565	TRUE	230	350	230	350	34	27.2	J-566

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
1348	J-566	TRUE	230	343.87	230.01	343.88	21.8	28.7	J-275
1351	J-567	TRUE	230	300	230.03	300.03	23.9	23.9	J-567
1353	J-568	TRUE	230	350	230.28	350.28	36.8	34.5	J-229
1356	J-569	TRUE	230	350	230	350	25.4	27.5	J-578
1359	J-570	TRUE	230	350	230	350	23.9	24.5	J-571
1362	J-571	TRUE	230	348.7	230	348.7	21.8	22.8	J-578
1366	J-573	TRUE	230	350	230.1	350.1	29.6	26.3	J-463
1369	J-574	TRUE	230	350	231	351	30.3	26.8	J-463
1372	J-575	TRUE	230	350	230	350	32	31.9	J-697
1375	J-576	TRUE	230	350	230.9	350.9	38.5	31.5	J-697
1385	J-577	TRUE	230	294.42	230	294.42	23.5	21.8	J-592
1387	J-578	TRUE	230	345.96	230	345.96	21.8	24.7	J-571
1390	J-579	TRUE	230	248.08	230	248.08	21.8	22.4	J-498
1395	J-582	TRUE	230	231.73	232.23	233.96	21.8	29.8	J-579
1399	J-584	TRUE	230	235.67	230	235.67	21.8	24.1	J-715
1405	J-586	TRUE	230	350	230.05	350.05	36.2	31.1	J-697
1410	J-588	TRUE	230	350	230.8	350.8	31.1	31.2	J-635
1425	J-591	TRUE	230	275.2	230	275.2	23.3	21.8	J-584
1428	J-592	TRUE	230	267.96	231.14	269.1	21.8	35.3	J-577
1449	J-601	TRUE	60	179.36	61.46	180.82	21.8	23.5	J-371
1452	J-602	TRUE	60	197.68	60	197.68	25.8	21.8	J-252
1459	J-604	TRUE	60	248.79	61.47	250.27	26.2	21.8	J-491
1473	J-607	TRUE	230	311.76	230	311.76	21.8	26.1	J-463
1475	J-608	TRUE	230	350	230	350	32	30.2	J-697
1478	J-609	TRUE	230	348.46	230	348.46	21.8	30.5	J-697
1480	J-610	TRUE	230	350	230.38	350.38	34.4	30.6	J-697
1483	J-611	TRUE	230	350	230	350	41.4	33.2	J-697
1499	J-613	TRUE	230	350	235.74	355.74	29.2	26.6	J-584
1504	J-614	TRUE	230	350	231.04	351.04	31.5	25.8	J-566
1526	J-619	TRUE	230	256.52	234.14	260.65	21.8	24.1	J-584
1548	J-624	TRUE	230	347.41	230	347.41	21.8	30.7	J-439
1552	J-626	TRUE	230	350	230	350	26.5	24.6	J-412
1556	J-628	TRUE	230	350	230	350	29.5	23.3	J-697
1559	J-629	TRUE	230	350	230	350	48.6	25.9	J-697
1604	J-632	TRUE	230	350	230	350	38.2	34.4	J-355
1619	J-634	TRUE	230	350	230	350	27.2	22.1	J-697
1623	J-635	TRUE	250	306.69	258.1	314.79	21.8	30.9	J-402
1681	J-642	TRUE	230	350	230	350	33.8	26.7	J-697
1711	J-644	TRUE	60	116.77	61.55	118.32	21.8	43.5	J-382
1741	J-647	TRUE	230	350	230	350	25.6	23.9	J-697
1744	8 (Dum	TRUE	230	332.59	231.36	333.95	21.8	26.6	J-649
1746	J-649	TRUE	230	340.55	230	340.55	21.8	23.2	J-677
1748	J-650	TRUE	230	350	230	350	23.5	23.1	J-697
1857	J-662	TRUE	60	148.6	60.08	148.68	21.8	32.6	J-372
1859	J-663	TRUE	60	140.03	60.1	140.13	21.8	36.3	J-372
1930	J-668	TRUE	230	325.4	230.5	325.9	22.4	21.8	J-592
1933	J-669	TRUE	230	350	230	350	31.9	35.2	J-713
1936	J-670	TRUE	230	276.12	231.87	277.99	21.8	36.9	J-389
1938	J-671	TRUE	230	257.41	233.97	261.38	21.8	21.8	J-584
1941	J-672	TRUE	230	275.33	230	275.33	24.8	21.8	J-713
1944	J-673	TRUE	230	350	230.67	350.67	32.1	22.4	J-697
1947	J-674	TRUE	230	270.63	237.73	278.36	26.8	21.8	J-584
1949	J-675	TRUE	230	350	231	351	31.4	27.1	J-463
1952	J-676	TRUE	230	350	230.31	350.31	32.9	28.5	J-607
1955	J-677	TRUE	230	318.71	232.81	321.52	21.8	30.1	J-649
1956	J-678	TRUE	230	335.24	230	335.24	22	21.8	J-677
1957	J-679	TRUE	230	326.19	230	326.19	21.8	26.3	J-677
1959	J-681	TRUE	230	345.11	230	345.11	27.9	21.8	J-679

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
1965	J-682	TRUE	60	174.78	60.38	175.16	21.8	28.2	J-371
1969	J-683	TRUE	230	350	231.93	351.93	23.2	34.7	J-474
1970	J-684	TRUE	230	322.49	230.85	323.35	21.8	40.3	J-686
1974	J-685	TRUE	230	350	232.25	352.25	43.6	36	J-229
1977	J-686	TRUE	230	350	231.12	351.12	25.8	34	J-684
1980	J-687	TRUE	230	350	230.22	350.22	31.6	30.9	J-697
1983	J-688	TRUE	230	350	230.3	350.3	35.9	33.8	J-697
1986	J-689	TRUE	230	350	230.8	350.8	35.6	31	J-697
1989	J-690	TRUE	60	120.92	60.74	121.66	41.6	21.8	J-372
1995	J-692	TRUE	60	102.43	60.38	102.81	21.8	21.8	J-499
1998	J-693	TRUE	60	148.41	60.06	148.47	21.8	21.8	J-72
2001	J-694	TRUE	230	258.62	230.83	259.46	21.8	39.2	J-695
2004	J-695	TRUE	230	254.27	231	255.27	21.8	39.2	J-694
2007	J-696	FALSE	230	134.08	230.86	134.94	21.8	39.7	J-715
2009	J-697	TRUE	230	344.14	231.23	345.37	21.8	26.9	J-650
2012	J-698	TRUE	230	350	230.22	350.22	29.6	26.4	J-463
2015	J-699	TRUE	230	350	230.12	350.12	42.9	33.2	J-697
2024	J-701	TRUE	230	289.71	230	289.71	21.8	22.9	J-579
2027	J-702	TRUE	230	350	230	350	30.3	49.9	J-719
2048	J-709	TRUE	230	350	230	350	30.6	26.8	J-584
2064	J-713	TRUE	230	269.29	230	269.29	21.8	29.9	J-672
2071	J-715	FALSE	230	172.76	230	172.76	21.8	26.5	J-696
2093	J-718	TRUE	230	273.74	230	273.74	22.3	21.8	J-584
2142	J-719	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2145	J-720	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2148	J-721	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2153	J-723	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2155	J-724	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2157	J-725	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
185	J-160	584,027.01	5,934,838.88	678.02	0	78.90	733.59
186	J-222	582,145.56	5,932,813.74	700.26	0	63.30	744.85
187	J-162	583,810.38	5,934,670.57	685.00	0	69.00	733.60
188	J-138	584,613.67	5,935,181.42	678.38	0	78.30	733.53
189	J-192	581,191.96	5,933,912.97	677.56	0	95.50	744.80
190	J-119	584,936.53	5,935,869.14	667.10	0	70.80	717.00
191	J-134	584,764.89	5,935,072.26	680.51	0.08	75.30	733.54
192	J-67	581,650.04	5,931,561.40	710.00	0.01	77.50	764.59
193	J-38	581,243.76	5,931,279.09	710.00	0.02	77.50	764.63
194	J-41	581,141.03	5,931,480.63	710.00	0.04	77.50	764.58
195	J-144	584,396.66	5,935,219.39	675.00	0	83.10	733.53
196	J-37	581,243.76	5,931,168.95	710.00	0.01	77.60	764.65
197	J-472	580,740.47	5,933,183.14	689.91	0	78.00	744.86
198	J-201	581,815.00	5,933,229.15	690.13	0	77.70	744.84
199	J-91	582,694.12	5,935,128.13	660.00	0	79.70	716.13
200	J-103	585,091.20	5,936,277.99	665.00	0.1	73.80	717.00
201	J-53	581,438.28	5,930,980.15	710.00	0.09	77.60	764.66
202	J-40	581,233.98	5,931,482.32	710.00	0.01	77.50	764.59
203	J-107	584,778.23	5,935,996.97	664.16	0	75.00	717.00
204	J-212	581,825.45	5,932,053.99	710.00	0	77.20	764.38
205	J-197	581,603.91	5,933,472.82	685.44	0	84.30	744.83
206	J-159	584,150.38	5,934,848.85	679.15	0	77.30	733.58
207	J-163	583,696.80	5,934,580.94	685.00	0	69.00	733.61
208	J-92	582,355.13	5,935,027.71	660.00	0.07	79.60	716.11
209	J-90	582,616.55	5,935,084.61	660.00	0.15	79.70	716.13
210	J-111	585,098.38	5,935,794.30	672.05	0.14	63.80	717.00
211	J-177	583,865.02	5,934,178.46	693.29	0	57.20	733.60
212	J-471	580,745.35	5,933,130.74	690.00	0	77.90	744.87
213	J-233	584,681.75	5,934,979.21	681.75	0.11	73.50	733.54
214	68 (Dum	580,952.95	5,932,747.92	698.59	2.05	65.70	744.88
215	J-1	579,511.27	5,931,168.86	705.00	0.55	84.20	764.34
216	J-174	583,865.88	5,934,330.48	690.60	0.11	61.00	733.60
218	J-131	584,433.28	5,934,995.60	679.54	0.11	76.70	733.54
219	J-100	584,835.40	5,936,162.83	665.00	0.16	73.80	717.00
220	J-75	581,067.83	5,934,963.64	655.66	0	85.80	716.10
221	J-60	581,268.02	5,931,483.28	710.00	0	77.50	764.59
222	J-217	581,836.74	5,931,627.98	710.00	0	77.50	764.58
223	J-146	584,443.42	5,934,865.47	686.39	0	67.00	733.55
224	J-6	579,945.01	5,931,013.88	708.42	0.02	79.50	764.41
225	J-169	583,532.49	5,933,358.14	702.50	0	60.10	744.85
226	J-4	579,847.42	5,931,278.15	705.69	0	83.30	764.36
227	J-27	580,669.54	5,930,951.45	710.00	0.08	77.40	764.50
228	J-158	584,415.79	5,934,856.33	685.70	0	67.90	733.57
229	J-14	580,335.90	5,931,383.96	710.00	0	77.20	764.37
230	J-105	584,480.67	5,935,747.97	663.83	0.14	75.50	717.00
231	J-261	581,205.35	5,933,531.77	685.10	0	84.80	744.82
232	J-51	581,311.65	5,930,974.43	710.00	0.2	77.60	764.68

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
233	J-183	582,114.01	5,933,238.15	690.57	0	77.00	744.84
234	J-106	584,742.82	5,936,007.34	663.04	0.08	76.60	717.00
235	J-244	581,247.28	5,930,944.87	712.82	0	73.70	764.71
236	J-185	582,109.89	5,933,372.58	689.49	0.35	78.60	744.84
237	J-205	581,855.89	5,932,883.46	697.62	0	67.10	744.86
238	J-88	582,477.45	5,934,962.82	661.52	0.14	77.50	716.12
239	J-87	582,416.94	5,934,900.96	661.92	0	76.90	716.11
240	J-104	584,294.78	5,935,708.60	663.84	0.14	75.50	717.00
241	J-246	581,897.49	5,931,628.85	710.00	0	77.50	764.58
242	J-232	584,892.94	5,934,920.80	684.28	0	69.90	733.54
243	J-30	580,902.68	5,930,954.31	710.00	0.05	77.40	764.56
244	J-9	580,323.88	5,930,706.90	710.00	0.04	77.30	764.44
245	J-182	582,375.00	5,933,263.31	692.23	0.11	74.70	744.84
246	J-203	581,820.84	5,933,082.06	694.39	0.22	71.60	744.85
247	J-65	581,778.70	5,931,509.37	710.00	0	77.50	764.59
248	J-113	584,707.09	5,935,813.70	666.13	0	72.20	717.00
249	J-126	584,863.23	5,935,234.31	677.59	0.14	79.40	733.54
251	J-175	583,860.04	5,934,212.11	692.89	0.06	57.80	733.60
252	J-108	584,859.07	5,935,946.29	665.31	0.04	73.40	717.00
253	J-152	584,376.31	5,934,716.20	687.39	0.13	65.50	733.55
254	J-200	581,603.76	5,933,231.65	690.97	0	76.50	744.84
255	J-36	581,245.19	5,931,074.55	710.09	0	77.50	764.67
256	J-143	584,418.36	5,935,234.31	675.12	0	82.90	733.53
257	J-81	581,858.80	5,934,643.74	665.00	0	72.50	716.10
258	J-12	580,220.70	5,931,351.93	710.00	0	77.20	764.38
259	J-226	582,264.78	5,932,630.99	705.95	0.06	55.20	744.86
260	J-45	580,893.42	5,931,477.97	710.00	0.06	77.40	764.55
261	J-17	580,311.95	5,931,197.47	710.00	0	77.20	764.40
262	J-206	581,857.12	5,932,625.05	705.00	0	56.60	744.87
263	J-115	584,825.79	5,935,796.19	666.72	0.05	71.40	717.00
264	J-150	584,403.44	5,934,788.09	687.49	0	65.40	733.55
265	J-77	581,167.95	5,934,784.85	659.73	0	80.00	716.10
266	J-18	580,314.80	5,931,075.86	708.85	0	78.90	764.42
267	J-141	584,418.36	5,935,257.37	675.00	0	83.10	733.53
268	J-8	580,315.10	5,931,044.42	708.00	0.11	80.10	764.42
270	J-118	585,014.92	5,935,991.35	667.08	0.16	70.90	717.00
271	J-34	581,184.46	5,930,958.60	713.60	0	72.50	764.67
272	J-263	580,990.65	5,933,540.47	686.38	0	83.00	744.83
273	J-135	584,890.35	5,935,064.77	680.00	0.19	76.00	733.54
274	J-121	584,820.49	5,935,506.24	675.00	0.04	59.60	717.01
275	J-181	582,540.59	5,933,275.94	693.31	0.02	73.20	744.84
276	J-264	581,189.28	5,933,693.30	681.63	1.83	89.70	744.81
277	J-220	582,117.40	5,932,983.49	695.93	0.24	69.40	744.85
278	J-252	578,937.82	5,934,828.30	660.00	0.04	79.60	716.06
279	J-142	584,423.78	5,935,296.70	675.00	0	83.10	733.53
280	J-109	584,921.74	5,935,884.21	666.76	0.08	71.30	717.00
281	J-129	584,501.09	5,935,261.44	676.15	0.16	81.50	733.53

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
282	J-39	581,239.51	5,931,322.53	710.00	0	77.50	764.62
283	J-164	583,606.03	5,934,540.88	685.74	0	68.00	733.61
285	J-219	582,113.42	5,933,083.07	693.64	0.08	72.70	744.85
286	J-469	580,912.58	5,932,829.94	695.69	0	69.80	744.87
287	J-256	580,441.19	5,935,464.19	655.00	0.08	86.70	716.06
288	J-120	584,734.38	5,935,692.75	670.15	0	66.50	717.00
289	J-230	581,106.83	5,932,460.94	706.93	0	53.90	744.89
290	J-130	584,431.22	5,935,093.29	677.58	0.08	79.40	733.54
291	J-117	585,014.92	5,936,121.64	665.00	0.11	73.80	717.00
292	J-223	582,152.61	5,932,731.90	702.98	0.01	59.40	744.85
293	J-218	581,867.74	5,931,628.35	710.00	0	77.50	764.58
294	J-46	580,798.60	5,931,476.05	710.00	0	77.40	764.52
295	J-2	579,680.28	5,931,170.16	705.50	0.33	83.50	764.35
296	J-26	580,564.63	5,931,456.51	710.00	0.02	77.30	764.47
297	J-189	581,084.12	5,934,453.39	665.00	0.11	72.50	716.11
298	J-211	581,876.01	5,932,068.33	710.09	0	77.10	764.38
299	J-23	580,668.11	5,931,070.17	710.00	0.03	77.30	764.48
301	J-59	581,386.82	5,931,485.18	710.00	1.83	77.50	764.59
302	J-156	584,404.53	5,934,722.07	688.13	0	64.50	733.55
303	J-199	581,769.17	5,933,510.82	685.00	0.02	84.90	744.83
305	J-148	584,454.98	5,934,760.96	689.42	0.02	62.60	733.55
306	J-132	584,558.06	5,935,001.03	680.87	0.07	74.80	733.54
307	J-19	580,403.49	5,931,080.18	707.98	0	80.10	764.43
308	J-83	581,967.59	5,934,879.14	661.00	0	78.20	716.10
309	J-139	584,644.86	5,935,312.98	676.87	0.1	80.40	733.53
310	J-133	584,653.03	5,935,049.18	680.00	0.07	76.00	733.54
311	J-96	584,368.02	5,935,856.50	660.02	0.09	80.90	717.00
312	J-204	581,850.05	5,933,080.11	694.67	0	71.20	744.85
313	J-52	581,362.87	5,930,976.72	710.00	0	77.60	764.67
314	J-55	581,524.10	5,931,157.51	710.00	0.1	77.50	764.61
315	J-74	580,931.94	5,934,929.32	656.10	0	85.20	716.09
316	J-253	578,957.63	5,934,474.88	660.00	0.02	79.60	716.06
317	J-225	582,168.53	5,932,538.56	707.11	0	53.60	744.86
318	J-186	582,113.31	5,933,524.29	685.00	0	84.90	744.84
319	J-66	581,776.04	5,931,621.09	710.00	0	77.50	764.59
320	J-227	582,440.48	5,932,638.63	706.71	1.63	54.10	744.86
321	J-54	581,528.40	5,930,990.16	710.00	0.01	77.60	764.64
322	J-470	580,815.61	5,933,005.16	692.36	0	74.50	744.87
323	J-165	583,521.11	5,934,524.87	687.40	0	65.60	733.62
324	J-32	581,064.31	5,930,954.31	710.00	0.08	77.50	764.61
325	J-42	581,092.22	5,931,480.07	710.00	0.05	77.50	764.58
326	J-178	583,196.31	5,933,356.52	696.11	0.19	69.20	744.84
327	J-93	584,191.17	5,935,768.07	660.00	0.16	80.90	717.00
328	J-97	584,487.83	5,935,930.76	660.00	0.09	80.90	717.00
329	J-122	584,821.83	5,935,460.16	675.00	0.06	59.60	717.01
330	J-84	582,052.57	5,934,877.70	660.32	0.02	79.20	716.10
331	J-62	581,787.29	5,931,163.23	710.00	0	77.50	764.60

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
332	J-29	580,819.72	5,930,954.31	710.00	0.01	77.40	764.54
333	J-94	584,255.00	5,935,803.19	660.00	0	80.90	717.00
334	J-72	580,939.25	5,935,281.52	655.00	0.09	86.70	716.08
335	J-188	582,266.79	5,933,527.86	686.55	0	82.70	744.84
336	J-231	580,791.64	5,934,829.71	658.98	0	81.10	716.09
337	J-229	581,106.36	5,932,407.45	708.32	0.03	51.90	744.89
338	J-466	580,911.13	5,932,595.87	700.92	0	62.40	744.89
339	J-10	579,940.63	5,931,347.65	705.00	0.17	84.30	764.37
340	J-95	584,308.01	5,935,828.08	660.00	0.03	80.90	717.00
341	5 (Dumr	580,618.70	5,931,343.45	710.00	2.05	77.30	764.47
342	J-78	581,169.38	5,934,827.76	658.78	0	81.40	716.10
343	J-99	584,705.73	5,936,073.73	662.40	0.2	77.50	717.00
345	J-7	579,949.27	5,931,039.18	708.18	0	79.80	764.41
346	J-196	581,597.38	5,933,587.35	683.44	0.15	87.10	744.83
347	J-208	581,439.10	5,932,459.61	706.90	0.02	53.90	744.89
348	J-68	580,592.95	5,934,845.60	659.96	0.12	79.60	716.07
349	J-73	580,877.59	5,934,935.04	656.37	0.19	84.80	716.09
350	J-79	581,379.39	5,934,807.01	659.35	0	80.60	716.10
351	J-464	580,909.59	5,932,458.81	705.00	0	56.60	744.89
352	J-221	582,125.37	5,932,889.89	698.69	0	65.50	744.85
353	J-63	581,781.57	5,931,261.93	710.00	0.11	77.50	764.60
354	J-48	580,984.87	5,931,374.92	710.00	0	77.50	764.57
355	J-173	583,884.96	5,934,430.17	688.11	0.19	64.60	733.60
356	J-136	584,891.71	5,935,152.93	679.69	0	76.40	733.54
357	J-255	580,263.72	5,934,844.03	655.00	0.06	86.70	716.06
358	J-137	584,631.30	5,935,458.11	675.00	0.13	59.60	717.01
359	J-44	580,980.30	5,931,477.21	710.00	0	77.50	764.57
363	J-69	580,683.06	5,934,980.81	657.45	0.12	83.20	716.08
364	J-461	580,324.91	5,931,786.10	709.66	0.08	77.30	764.09
365	J-50	580,982.78	5,931,104.50	710.00	0	77.50	764.58
366	J-58	581,515.23	5,931,487.78	710.00	0.03	77.50	764.59
367	J-61	581,675.72	5,931,158.94	710.00	0.02	77.50	764.61
368	6 (Dumr	581,521.24	5,931,231.89	710.00	2.05	77.50	764.60
369	J-47	580,657.25	5,931,474.23	710.00	0.01	77.40	764.49
370	J-176	583,816.43	5,934,177.51	694.01	0.39	56.20	733.60
371	J-128	584,625.87	5,935,253.30	677.60	0.11	79.40	733.53
372	J-151	584,368.17	5,934,786.73	686.46	0.05	66.80	733.55
373	J-13	580,314.34	5,931,355.17	710.00	0.01	77.20	764.38
374	J-33	581,129.33	5,930,960.12	711.70	0.01	75.10	764.64
376	J-123	584,823.26	5,935,405.93	675.00	0.01	59.60	717.01
378	J-21	580,469.94	5,931,023.06	709.21	0.11	78.40	764.45
379	30 (Dum	582,732.45	5,933,277.32	694.69	2.05	71.20	744.84
380	J-202	581,938.04	5,933,230.80	691.08	0	76.30	744.84
381	J-168	583,530.88	5,933,486.18	696.64	0	68.40	744.84
382	J-49	580,979.92	5,931,250.39	710.00	0.11	77.50	764.57
383	J-110	584,991.94	5,935,799.82	669.94	0.13	66.80	717.00
384	J-102	585,009.28	5,936,277.18	663.86	0.08	75.40	717.00

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
385	J-31	580,988.50	5,930,955.74	710.00	0	77.50	764.58
386	J-147	584,453.45	5,934,840.49	687.96	0	64.70	733.56
387	J-28	580,746.77	5,930,951.45	710.00	0	77.40	764.52
388	J-24	580,662.38	5,931,227.51	710.00	0.01	77.30	764.48
389	J-465	580,908.44	5,932,502.26	705.00	0	56.60	744.89
390	J-154	584,411.58	5,934,645.67	688.86	0.1	63.40	733.55
391	J-89	582,495.94	5,935,018.15	660.81	0.05	78.50	716.12
392	J-153	584,372.24	5,934,648.39	687.96	0.08	64.70	733.55
394	J-98	584,633.48	5,936,025.02	660.29	0.09	80.50	717.00
395	J-259	580,335.37	5,931,450.69	710.00	0.35	77.10	764.32
396	J-3	579,802.82	5,931,225.65	706.10	0.27	82.70	764.35
397	J-85	582,115.29	5,934,881.39	660.25	1.14	79.30	716.10
398	J-71	580,907.63	5,935,126.70	655.00	0.08	86.70	716.08
399	J-116	585,011.03	5,936,214.00	665.00	0.1	73.80	717.00
400	J-167	583,523.26	5,933,883.17	694.49	0	71.40	744.82
401	J-70	580,800.35	5,935,056.62	655.00	0.08	86.70	716.08
402	J-43	581,021.33	5,931,478.00	710.00	0	77.50	764.57
403	J-179	582,955.94	5,933,296.73	695.00	0	70.70	744.84
406	J-224	582,174.13	5,932,629.80	705.00	0.24	56.60	744.86
407	J-35	581,249.48	5,930,968.71	712.31	0	74.40	764.69
408	J-145	584,444.72	5,934,995.00	679.73	0	76.40	733.54
409	J-170	583,875.75	5,934,103.79	694.22	0	55.90	733.60
410	J-228	582,556.63	5,932,642.20	708.46	0.16	51.70	744.86
411	J-15	580,429.24	5,931,386.27	710.00	0.18	77.20	764.41
412	eson Zo	581,783.00	5,931,386.36	710.00	0.23	77.50	764.60
413	J-262	580,997.23	5,933,183.46	691.01	0	76.40	744.86
414	J-76	581,080.70	5,934,784.85	659.39	0	80.50	716.10
415	J-82	581,851.29	5,934,868.21	661.29	0	77.80	716.10
416	J-187	582,195.09	5,933,525.99	685.61	0.06	84.10	744.84
417	J-124	584,883.57	5,935,380.79	675.00	0	59.60	717.01
418	J-86	582,250.40	5,934,884.38	660.62	0.07	78.80	716.11
419	J-101	584,926.98	5,936,225.99	665.00	0.13	73.80	717.00
420	J-140	584,498.38	5,935,323.83	675.17	0.06	82.80	733.52
422	J-198	581,719.60	5,933,471.45	685.00	0.66	84.90	744.83
423	J-248	581,903.32	5,932,070.50	710.80	0	76.10	764.39
424	J-247	581,891.92	5,931,996.23	710.54	0	76.50	764.43
426	J-5	579,945.61	5,931,212.07	706.57	0	82.00	764.37
427	J-171	583,770.32	5,934,494.96	687.57	0.1	65.30	733.60
428	J-22	580,670.19	5,931,024.49	710.00	0.05	77.30	764.48
429	J-16	580,476.44	5,931,406.30	710.00	0	77.30	764.43
430	J-184	582,112.89	5,933,307.91	690.00	0.1	77.80	744.84
431	J-57	581,518.38	5,931,364.91	710.00	0.01	77.50	764.60
432	J-11	580,115.27	5,931,356.66	710.00	0.21	77.20	764.37
433	J-467	580,945.04	5,932,670.20	698.68	0.37	65.60	744.88
434	J-127	584,738.45	5,935,230.24	678.28	0.09	78.40	733.54
435	J-20	580,457.07	5,931,080.27	710.00	0.01	77.30	764.44
436	J-172	583,827.64	5,934,460.07	688.49	0.1	64.00	733.60

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437	J-157	584,429.91	5,934,843.88	686.75	0.05	66.50	733.57
438	J-161	583,932.31	5,934,795.27	682.13	0	73.00	733.59
439	J-114	584,722.31	5,935,766.42	668.89	0.01	68.30	717.00
440	J-149	584,407.51	5,934,758.25	688.05	0.05	64.60	733.55
441	akeshor	584,613.31	5,935,863.83	662.35	0.15	77.60	717.00
442	J-257	580,273.72	5,935,345.33	655.00	0.03	86.70	716.06
443	J-155	584,414.29	5,934,584.64	689.82	0.07	62.10	733.55
444	0 (Dumr	581,734.36	5,934,653.26	664.25	2.05	73.60	716.10
445	J-125	580,796.41	5,934,677.05	660.00	0.12	79.60	716.09
446	J-193	580,848.07	5,934,368.52	665.00	0.09	72.50	716.09
447	J-194	580,976.24	5,934,190.14	670.34	0.09	64.90	716.09
448	J-209	580,970.10	5,934,678.48	660.00	0.1	79.60	716.09
449	J-214	580,690.97	5,934,694.14	660.00	0	79.60	716.09
450	J-215	580,690.08	5,934,275.57	666.57	0	70.30	716.08
451	J-216	580,551.33	5,931,612.96	710.00	0	77.40	764.49
452	J-274	580,878.67	5,934,350.62	665.00	0	72.50	716.09
453	J-275	582,747.60	5,932,645.50	707.89	0.02	52.50	744.86
454	J-276	582,369.34	5,933,528.13	687.83	0.03	80.90	744.84
455	J-277	582,535.87	5,933,574.49	689.17	0.02	79.00	744.84
456	J-278	582,252.25	5,931,642.45	710.00	0	77.60	764.64
457	79 (Dum	582,429.55	5,931,644.90	712.34	2.05	74.30	764.67
458	J-280	582,657.75	5,931,650.26	715.00	0.63	70.60	764.73
460	J-317	582,199.34	5,932,409.79	709.00	2.04	50.90	744.86
461	preme S	579,529.45	5,930,618.12	710.00	0	77.10	764.33
462	J-369	580,329.98	5,930,530.83	711.57	0.07	75.00	764.43
463	J-413	584,962.80	5,935,893.67	667.76	0	69.90	717.00
464	J-414	580,992.55	5,933,333.24	690.00	0.01	77.90	744.85
465	J-415	580,322.26	5,930,836.93	709.65	0	77.80	764.43
466	J-416	580,996.56	5,933,257.52	690.00	0	77.90	744.85
467	J-417	581,409.37	5,930,749.49	710.00	0	77.60	764.68
468	J-418	581,473.62	5,930,748.31	710.00	0	77.60	764.68
469	J-426	581,027.60	5,931,617.03	710.00	0	77.40	764.56
470	J-427	581,474.51	5,931,632.42	711.07	0.29	76.00	764.59
472	J-433	581,230.40	5,931,623.34	710.40	0.04	76.90	764.59
473	J-455	585,032.66	5,934,913.17	682.73	0.02	72.10	733.54
474	J-456	584,578.32	5,935,458.14	674.14	0	60.90	717.01
475	J-457	584,473.57	5,935,561.72	668.91	0.05	68.30	717.01
476	J-458	584,552.88	5,935,630.17	668.40	0.02	69.00	717.01
477	J-459	584,630.33	5,935,622.09	670.00	0	66.70	717.01
478	J-460	584,399.04	5,935,479.51	669.91	0.04	66.80	717.01
479	J-462	584,407.26	5,935,625.71	666.69	0.02	71.40	717.00
480	J-473	584,318.20	5,935,632.34	665.00	0	73.80	717.00
481	J-474	580,907.43	5,933,564.98	687.95	0	80.70	744.83
482	J-475	584,394.68	5,934,582.93	689.24	0	62.90	733.55
483	J-476	584,378.97	5,934,558.28	688.81	0	63.50	733.55
484	J-477	584,385.26	5,934,422.76	691.17	0.11	60.20	733.55
485	J-478	584,452.79	5,934,337.14	695.00	0.05	54.70	733.55

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486	J-479	584,456.37	5,934,203.11	695.00	0	54.70	733.55
487	J-480	584,346.35	5,934,199.50	695.00	0.05	54.70	733.55
488	untry Sq	584,451.06	5,934,432.27	692.57	0.01	58.20	733.55
489	J-482	584,501.53	5,934,435.28	693.17	0	57.30	733.55
490	J-483	582,554.17	5,934,938.61	663.74	0	74.30	716.12
491	J-484	580,257.71	5,934,709.77	655.00	0.08	86.70	716.06
492	J-485	580,164.03	5,934,700.83	655.00	0.03	86.70	716.06
493	Greenbria	580,160.09	5,934,602.78	655.28	0.11	86.30	716.06
494	J-487	580,157.19	5,934,461.58	658.62	0.04	81.50	716.06
495	J-488	580,264.39	5,934,426.70	660.00	0	79.60	716.06
496	J-489	580,262.15	5,934,273.16	662.79	0.02	75.60	716.07
497	J-490	580,263.09	5,934,169.52	664.93	0.47	72.60	716.06
498	J-491	580,263.09	5,934,052.82	668.12	0	68.10	716.06
499	J-492	580,603.96	5,933,233.91	687.77	0.05	81.00	744.86
500	J-493	580,285.22	5,933,229.98	685.12	0	84.80	744.87
501	J-494	580,019.98	5,933,222.44	681.92	0	89.30	744.86
502	J-496	579,846.07	5,933,216.09	683.33	0	87.30	744.86
503	J-497	579,558.48	5,933,207.86	680.78	0.53	91.00	744.85
504	J-498	579,384.04	5,933,248.61	680.76	0	91.00	744.85
505	J-499	580,585.32	5,935,532.59	655.00	0.09	86.70	716.06
506	J-500	580,800.29	5,934,469.04	664.91	0.08	72.60	716.09
507	Panatton	580,493.51	5,932,097.85	705.00	0.42	56.70	744.97
508	J-502	581,171.70	5,934,953.60	655.96	0.06	85.40	716.10
509	J-503	581,266.41	5,934,961.33	656.39	0.08	84.80	716.10
510	J-504	581,381.72	5,934,985.17	655.83	0.08	85.50	716.10
511	J-505	581,484.80	5,934,976.15	656.63	0.13	84.40	716.10
512	J-506	581,091.17	5,935,043.79	655.00	0.08	86.70	716.10
513	J-507	581,089.89	5,935,190.68	655.00	0.1	86.70	716.10
514	J-508	580,357.88	5,929,962.29	715.00	0	70.10	764.39
515	J-510	582,422.00	5,934,645.84	669.74	0	65.80	716.12
516	J-511	582,750.31	5,934,542.81	677.72	0	54.50	716.14
518	J-338	584,547.50	5,934,594.73	690.00	0.07	61.80	733.55
519	J-339	584,844.68	5,934,804.41	685.00	0.12	68.90	733.55
520	J-340	584,755.52	5,934,642.61	690.00	0.3	61.80	733.55
521	J-341	584,801.75	5,934,584.83	690.00	0.08	61.80	733.55
522	J-342	584,626.74	5,934,593.08	689.17	0	63.00	733.55
523	J-343	584,630.05	5,934,465.96	690.99	0.19	60.40	733.55
524	J-344	584,677.93	5,934,368.55	692.43	0	58.40	733.55
525	J-345	584,719.20	5,934,290.95	693.49	0.13	56.90	733.55
526	J-346	584,743.41	5,934,208.42	694.61	0	55.30	733.55
527	J-347	579,821.81	5,934,839.28	655.41	0	86.10	716.06
528	J-348	579,906.54	5,934,628.04	660.00	0.26	79.60	716.06
529	J-349	579,552.52	5,934,390.76	660.66	0.1	78.60	716.05
530	J-350	579,560.18	5,934,186.05	665.00	0	72.50	716.05
531	J-351	579,798.46	5,934,185.19	665.00	1.19	72.50	716.06
532	J-352	580,053.20	5,934,194.89	663.47	0	74.60	716.06
533	J-353	580,058.17	5,934,050.10	666.33	0	70.60	716.06

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
534	J-354	580,312.61	5,932,449.20	700.00	0	63.80	744.95
535	J-355	580,307.45	5,932,622.04	699.36	0	64.70	744.93
549	J-371	579,058.45	5,934,237.94	663.97	0	73.90	716.05
550	J-372	582,913.82	5,934,492.65	678.92	0	52.80	716.15
551	J-373	583,715.84	5,934,179.49	692.83	0	57.90	733.60
552	J-374	583,711.11	5,934,323.53	691.08	0.24	60.40	733.61
553	J-375	583,617.79	5,934,384.39	690.00	0	61.90	733.61
554	J-376	583,516.06	5,934,862.86	676.07	0	81.60	733.56
555	J-377	583,509.18	5,935,200.72	667.03	0	94.30	733.50
558	J-380	584,314.82	5,935,494.87	667.94	0	69.60	717.01
559	J-381	582,697.16	5,935,191.31	659.04	0	81.00	716.13
560	J-382	583,041.84	5,935,201.63	664.23	0	73.70	716.15
561	J-384	584,690.83	5,933,525.77	696.39	3	68.80	744.87
562	J-385	584,716.16	5,932,759.41	700.00	9.2	63.80	744.96
563	J-386	584,750.39	5,931,678.72	704.69	0	81.80	762.32
564	J-387	583,563.61	5,931,658.08	713.93	0	69.20	762.71
565	J-388	583,543.54	5,932,874.51	705.00	1	56.60	744.90
566	J-389	583,975.37	5,932,756.68	704.50	8.06	57.30	744.84
567	J-390	581,655.30	5,929,996.66	715.00	0.26	70.50	764.65
568	91 (Dum	580,970.38	5,929,997.16	715.00	2.05	70.20	764.44
569	J-392	580,813.36	5,929,007.00	720.00	0.04	63.00	764.38
570	J-393	581,663.98	5,929,028.48	715.00	13.62	70.10	764.38
577	J-400	579,105.90	5,930,558.91	710.00	7.59	77.10	764.31
579	J-402	582,479.98	5,930,426.58	717.66	0	66.40	764.42
588	J-412	582,422.40	5,929,556.63	716.72	0	67.70	764.38
593	J-424	581,660.97	5,929,623.62	713.50	0.08	72.40	764.53
594	J-425	581,665.24	5,929,366.79	715.00	0	70.20	764.45
596	J-429	584,050.71	5,934,639.34	683.04	0.53	71.80	733.59
600	J-435	584,997.94	5,934,344.14	690.00	0.78	61.80	733.54
601	J-436	585,098.32	5,934,735.10	689.76	0	62.20	733.54
602	J-437	584,749.37	5,934,767.29	686.86	0	66.30	733.55
603	J-438	584,571.05	5,934,804.08	690.00	0.08	61.80	733.55
604	J-439	580,563.59	5,929,433.52	710.00	5.13	77.20	764.42
614	J-449	581,421.38	5,932,595.83	704.53	0.64	57.30	744.88
615	J-450	579,529.68	5,930,833.39	710.00	0	77.10	764.33
616	J-451	582,718.01	5,933,794.15	686.82	0.24	82.30	744.83
617	J-452	584,568.62	5,934,437.45	692.38	0.21	58.40	733.55
618	J-453	584,709.29	5,934,821.05	685.00	0.19	68.90	733.55
619	J-454	578,967.63	5,931,180.10	705.00	0.26	84.20	764.33
620	J-463	579,109.34	5,929,955.19	715.00	5.56	70.00	764.31
621	J-481	579,912.34	5,929,983.06	710.05	0.34	77.10	764.34
623	J-495	581,742.29	5,930,634.26	710.00	0	77.60	764.66
624	J-514	581,024.45	5,930,758.71	710.00	0.13	77.50	764.59
625	J-509	582,414.25	5,929,796.24	715.00	7.41	70.10	764.38
1202	J-515	581,712.08	5,932,708.51	700.00	0.13	63.70	744.86
1205	J-516	581,669.94	5,929,192.84	715.00	0	70.10	764.40
1210	J-518	581,830.29	5,929,625.08	715.00	0	70.30	764.53

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1212	J-519	581,835.07	5,929,999.06	715.66	1.03	69.50	764.65
1215	J-520	583,628.60	5,934,178.46	691.55	0	59.70	733.60
1217	J-521	579,709.90	5,934,475.78	661.19	0	77.90	716.06
1221	J-523	579,612.49	5,934,670.51	660.00	0	79.60	716.06
1223	J-524	579,458.36	5,934,392.85	660.00	0	79.60	716.05
1225	J-525	579,864.05	5,934,327.41	663.27	0	74.90	716.06
1247	J-529	581,722.82	5,930,546.21	711.81	0.54	75.00	764.66
1250	J-530	581,718.67	5,930,439.72	715.00	0	70.50	764.66
1252	J-531	581,695.54	5,930,265.84	715.00	1.14	70.50	764.66
1254	J-532	581,651.35	5,930,158.96	715.00	0	70.50	764.65
1261	J-535	580,317.76	5,932,082.48	705.00	0	56.80	744.99
1266	J-536	579,735.35	5,931,890.66	705.76	7.45	82.60	763.98
1274	J-540	579,699.30	5,932,009.28	700.12	0	90.70	763.98
1276	J-541	579,799.44	5,931,732.09	706.82	0	81.10	763.98
1279	J-542	580,321.43	5,931,912.84	706.22	0	82.00	764.00
1293	J-547	580,088.01	5,932,060.24	705.55	0	82.90	763.99
1303	J-550	579,304.34	5,931,106.29	705.49	0.76	83.50	764.33
1308	J-552	581,774.56	5,934,875.22	660.36	0.56	79.10	716.10
1310	J-553	584,830.76	5,934,337.70	691.53	0	59.60	733.55
1313	J-554	581,603.99	5,933,308.60	689.95	0	77.90	744.83
1317	J-555	581,321.58	5,933,537.76	685.33	0	84.40	744.82
1320	J-556	581,323.99	5,933,415.23	687.59	0	81.20	744.82
1322	J-557	581,250.04	5,933,467.96	686.55	0	82.70	744.82
1323	J-558	581,327.56	5,933,467.96	686.59	0	82.70	744.82
1330	J-560	584,062.95	5,933,663.17	698.76	0.35	65.40	744.84
1333	J-561	582,080.53	5,931,638.76	710.00	0	77.50	764.61
1336	J-562	582,569.27	5,933,781.52	685.00	0.04	84.90	744.83
1339	J-563	583,023.88	5,933,806.52	689.56	0.8	78.40	744.82
1342	J-564	583,338.73	5,933,881.24	692.98	0	73.60	744.82
1345	J-565	582,744.06	5,932,889.49	701.99	0	60.80	744.86
1348	J-566	582,939.07	5,932,645.59	708.52	0.01	51.60	744.86
1351	J-567	583,002.33	5,932,556.57	709.00	0.04	50.90	744.86
1353	J-568	581,247.75	5,932,942.22	695.05	0.43	70.70	744.87
1356	J-569	580,577.37	5,932,096.86	705.31	0	56.30	744.96
1359	J-570	580,889.17	5,932,276.53	705.71	0	55.70	744.92
1362	J-571	580,880.65	5,932,177.12	706.82	0	54.10	744.93
1366	J-573	579,703.90	5,930,618.74	710.00	0.15	77.10	764.33
1369	J-574	579,904.79	5,930,431.14	710.00	1.5	77.10	764.34
1372	J-575	580,334.11	5,930,381.44	712.92	0	73.10	764.42
1375	J-576	581,433.82	5,929,694.07	715.00	1.34	70.30	764.50
1385	J-577	578,886.69	5,931,210.46	705.00	0	84.20	764.33
1387	J-578	580,835.80	5,932,122.19	707.37	0	53.30	744.93
1390	J-579	579,380.19	5,933,203.20	681.18	0	90.40	744.85
1395	J-582	579,207.27	5,933,179.51	680.57	3.34	91.2	744.85
1399	J-584	583,409.70	5,930,823.23	715	0	67.5	762.56
1405	J-586	581,295.24	5,929,939.38	715	0.08	70.2	764.47
1410	J-588	582,796.31	5,931,225.82	716.44	1.2	68.5	764.68

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1425	J-591	583,549.35	5,932,202.80	710	0	74.6	762.54
1428	J-592	578,708.52	5,931,205.20	706.2	1.71	82.5	764.33
1449	J-601	579,260.41	5,934,216.98	664.6	2.2	73	716.05
1452	J-602	579,239.65	5,934,831.22	656.38	0	84.7	716.06
1459	J-604	580,481.32	5,934,271.82	664.6	2.21	73.1	716.07
1473	J-607	579,543.45	5,929,983.64	715	0	70	764.33
1475	J-608	580,203.48	5,929,958.96	713.28	0	72.5	764.36
1478	J-609	580,201.01	5,929,860.38	713.35	0	72.4	764.36
1480	J-610	580,552.48	5,929,989.36	715	0.58	70.1	764.42
1483	J-611	580,325.86	5,930,727.51	710	0	77.3	764.44
1499	J-613	584,353.40	5,933,669.57	695.76	8.61	69.7	744.84
1504	J-614	582,934.11	5,932,889.06	702.94	1.57	59.5	744.86
1526	J-619	583,965.70	5,931,182.45	713.27	6.21	69.9	762.49
1548	J-624	580,979.44	5,929,436.53	710	0	77.3	764.43
1552	J-626	582,439.40	5,929,055.55	714.43	0	70.9	764.38
1556	J-628	580,375.92	5,929,164.92	717.44	0	66.6	764.38
1559	J-629	580,365.57	5,929,526.73	705	0	84.3	764.39
1604	J-632	580,288.92	5,933,147.51	687.49	0	81.5	744.87
1619	J-634	580,375.70	5,929,000.34	718.77	0	64.7	764.38
1623	J-635	582,786.29	5,930,481.33	720	12.15	63.1	764.44
1681	J-642	581,668.12	5,929,095.99	715	0	70.1	764.39
1711	J-644	583,046.25	5,935,496.03	657.92	2.32	82.6	716.14
1741	J-647	581,271.30	5,929,015.97	720	0	63	764.38
1744	48 (Dum	581,275.92	5,928,657.02	720	2.05	63	764.38
1746	J-649	581,116.31	5,928,684.12	720	0	63	764.38
1748	J-650	581,110.60	5,929,012.69	721.17	0	61.3	764.38
1857	J-662	581,970.85	5,935,022.33	659.84	0.12	79.9	716.1
1859	J-663	582,116.21	5,935,056.50	657.14	0.15	83.7	716.1
1930	J-668	579,102.84	5,931,112.30	705.76	0.75	83.1	764.33
1933	J-669	583,535.99	5,932,752.55	705	0	56.7	744.94
1936	J-670	583,961.86	5,933,365.46	702.7	2.81	59.8	744.84
1938	J-671	583,518.52	5,931,175.41	715	5.95	67.5	762.56
1941	J-672	584,343.63	5,931,657.91	705	0	81.5	762.43
1944	J-673	580,373.82	5,928,781.54	710.94	1	75.9	764.38
1947	J-674	584,337.86	5,932,018.97	706.68	11.59	79.2	762.46
1949	J-675	579,907.29	5,930,219.27	710	1.5	77.1	764.34
1952	J-676	580,043.39	5,929,961.76	711.5	0.46	75	764.35
1955	J-677	581,118.82	5,928,478.68	720	4.21	63	764.38
1956	J-678	580,803.49	5,928,525.59	713.58	0	72.1	764.38
1957	J-679	580,802.56	5,928,372.79	716.43	0	68.1	764.38
1959	J-681	580,378.87	5,928,367.84	710	0	77.2	764.38
1965	J-682	578,966.18	5,934,323.21	662.52	0.57	76	716.05
1969	J-683	580,796.56	5,933,569.23	687.51	2.89	81.4	744.83
1970	J-684	580,269.86	5,933,725.09	675.19	1.28	98.9	744.86
1974	J-685	580,448.50	5,933,230.44	686.51	3.37	82.8	744.86
1977	J-686	580,280.05	5,933,437.59	680.95	1.69	90.7	744.86
1980	J-687	580,334.63	5,930,185.02	714.34	0.32	71.1	764.4

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1983	J-688	580,557.45	5,930,744.75	710	0.46	77.3	764.49
1986	J-689	581,209.13	5,929,990.60	715	1.2	70.2	764.46
1989	J-690	582,115.87	5,934,642.64	664.96	1.11	72.6	716.11
1995	J-692	580,367.90	5,935,411.75	655	0.57	86.7	716.06
1998	J-693	580,939.14	5,935,207.44	655	0.09	86.7	716.08
2001	J-694	581,593.23	5,933,015.33	699.23	1.25	64.7	744.84
2004	J-695	581,706.64	5,932,861.89	698.36	1.5	66	744.85
2007	J-696	585,110.51	5,930,733.81	710	1.29	74.6	762.56
2009	J-697	580,594.61	5,929,003.29	722.94	1.84	58.8	764.38
2012	J-698	579,772.86	5,930,616.65	710	0.33	77.1	764.34
2015	J-699	581,656.96	5,929,786.31	715	0.18	70.4	764.58
2024	J-701	579,705.90	5,933,212.88	682	0	89.2	744.86
2027	J-702	582,798.78	5,931,094.66	716	0	69.1	764.67
2048	J-709	584,218.05	5,933,682.14	696.07	0	69.2	744.84
2064	J-713	584,319.60	5,931,332.55	708.64	0	76.4	762.46
2071	J-715	583,984.76	5,930,837.44	713.33	0	69.9	762.56
2093	J-718	583,981.82	5,932,017.05	712	0	71.7	762.54
2142	J-719	582,112.92	5,929,042.77	714.67	0	70.6	764.38
2145	J-720	581,900.54	5,929,036.19	714.83	0	70.3	764.38
2148	J-721	585,115.48	5,935,430.98	672.05	0	63.8	717
2153	J-723	581,364.59	5,933,637.12	683.4	0	87.2	744.82
2155	J-724	581,503.77	5,933,636.39	683.4	0	87.2	744.81
2157	J-725	581,505.07	5,933,898.96	680	0	92	744.81

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
654	P-120	J-102	J-116	63.00	200	120.00	0.00	0	0	0	PVC
655	P-156	J-147	J-148	80.00	200	120.00	1.76	0.06	0.002	0.03	PVC
656	P-78	J-73	J-74	58.00	200	120.00	-2.09	0.07	0.002	0.043	PVC
657	P-95	J-90	J-91	95.00	200	120.00	-2.33	0.07	0.005	0.05	PVC
658	P-74	J-69	J-70	140.00	200	120.00	-1.88	0.06	0.005	0.034	PVC
659	P-201	J-191	J-192	96.00	300	120.00	-9.44	0.13	0.009	0.094	PVC
660	P-5	J-5	J-7	173.00	200	120.00	-5.50	0.17	0.043	0.249	PVC
661	P-119	J-115	J-109	130.00	200	120.00	0.85	0.03	0.001	0.008	PVC
662	P-307(2)	J-471	J-470	147.00	300	120.00	-4.77	0.07	0.004	0.026	PVC
663	P-216	J-205	J-206	353.00	300	120.00	-6.56	0.09	0.012	0.048	PVC
664	P-124	J-119	J-110	95.00	200	120.00	0.27	0.01	0	0.001	PVC
665	P-17	J-17	J-18	122.00	300	110.00	-11.71	0.17	0.02	0.165	Asbestos Cement
666	P-11	J-11	J-12	113.00	300	120.00	-2.65	0.04	0.001	0.008	PVC
667	P-73	J-68	J-69	169.00	200	120.00	-1.76	0.06	0.005	0.03	PVC
668	P-235	J-223	J-224	98.00	300	120.00	-4.48	0.06	0.002	0.024	PVC
669	P-46	J-44	J-45	77.00	300	110.00	13.84	0.2	0.02	0.225	Asbestos Cement
670	P-152	J-131	J-145	12.00	200	120.00	-2.11	0.07	0.001	0.045	PVC
671	P-141	J-134	J-135	126.00	150	120.00	0.38	0.02	0.001	0.007	PVC
672	P-30	J-28	J-29	73.00	300	110.00	-14.90	0.21	0.019	0.258	Asbestos Cement
673	P-195	J-185	J-186	131.00	300	120.00	1.53	0.02	0	0.003	PVC
674	P-306(2)	J-472	J-471	85.00	300	120.00	-4.77	0.07	0.001	0.027	PVC
675	P-215	J-204	J-205	197.00	300	120.00	-6.56	0.09	0.009	0.048	PVC
676	P-159	J-150	J-151	35.00	200	120.00	0.28	0.01	0	0	PVC
677	P-16	J-13	J-17	156.00	300	110.00	-11.71	0.17	0.026	0.165	Asbestos Cement
678	P-160	J-151	J-152	71.00	200	120.00	0.22	0.01	0	0.001	PVC
679	P-110	J-106	J-107	37.00	200	120.00	-0.10	0	0	0	PVC
680	P-10	J-10	J-11	167.00	300	120.00	-2.44	0.03	0.001	0.008	PVC
681	P-234	J-222	J-223	81.00	300	120.00	-4.47	0.06	0.002	0.024	PVC
682	P-72	J-67	J-58	158.00	300	110.00	-3.23	0.05	0.002	0.015	Asbestos Cement
683	P-135	J-128	J-129	126.00	150	120.00	0.30	0.02	0.001	0.004	PVC
684	P-26	J-25 (Dummy)	J-26	119.00	300	110.00	1.83	0.03	0.001	0.005	Asbestos Cement
685	P-172	J-162	J-163	145.00	300	120.00	-5.91	0.08	0.006	0.04	PVC
686	P-140	J-133	J-134	114.00	200	120.00	0.47	0.01	0	0.003	PVC
687	P-158	J-149	J-150	30.00	200	120.00	0.28	0.01	0	0.002	PVC
688	P-52	J-49	J-50	146.00	300	110.00	-4.68	0.07	0.004	0.03	Asbestos Cement
689	P-148	J-129	J-141	83.00	150	120.00	0.00	0	0	0	PVC
690	P-182	J-173	J-174	102.00	200	120.00	-0.62	0.02	0	0.004	PVC
691	P-282	J-252	J-253	357.00	300	120.00	1.26	0.02	0.001	0.002	HDPE
692	P-217	J-206	J-207	75.00	300	120.00	-14.74	0.21	0.036	0.215	PVC
693	P-15	J-15	J-16	51.00	300	110.00	-19.26	0.27	0.021	0.414	Asbestos Cement
694	P-109	J-99	J-106	76.00	200	120.00	-0.02	0	0	0	PVC
695	P-142	J-135	J-136	88.00	200	120.00	1.59	0.05	0.002	0.024	PVC
696	P-181	J-172	J-173	65.00	200	120.00	1.34	0.04	0.001	0.018	PVC
697	P-71	J-66	J-67	156.00	300	110.00	-3.22	0.05	0.002	0.015	Asbestos Cement
698	P-193	J-183	J-184	75.00	300	120.00	1.98	0.03	0	0.005	PVC
699	P-238	J-226	J-227	86.00	300	120.00	1.37	0.02	0	0.003	PVC
700	P-157	J-148	J-149	48.00	200	120.00	0.70	0.02	0	0.005	PVC
701	P-75	J-70	J-71	128.00	200	120.00	0.26	0.01	0	0.001	PVC
702	P-147	J-129	J-140	62.00	150	120.00	2.05	0.12	0.01	0.163	PVC
703	P-129	J-122	J-123	62.00	200	120.00	-0.84	0.03	0	0.007	PVC
704	P-92	J-87	J-88	83.00	200	120.00	-1.99	0.06	0.003	0.038	PVC
705	P-171	J-161	J-162	175.00	300	120.00	-5.91	0.08	0.007	0.04	PVC
706	P-206	J-196	J-197	78.00	300	120.00	-4.26	0.06	0.003	0.022	PVC
707	P-45	J-43	J-44	40.00	300	110.00	9.27	0.13	0.004	0.107	Asbestos Cement
708	P-258	PMP-101	J-234	2.00	150	120.00	27.62	1.56	0.04	20.129	PVC
709	P-276	J-248	J-211	11.00	300	120.00	21.29	0.3	0.012	0.423	PVC
710	P-189	J-179	J-180 (Dummy)	237.00	350	120.00	-3.56	0.04	0.002	0.007	PVC
711	P-33	J-31	J-32	76.00	300	110.00	-19.65	0.28	0.033	0.43	Asbestos Cement
712	P-84	J-79	J-80 (Dummy)	386.00	250	120.00	0.18	0	0	0	PVC
713	P-255	PMP-104	J-237	2.00	250	120.00	0.00	0	0	0	PVC
714	P-29	J-27	J-28	77.00	300	110.00	-14.90	0.21	0.02	0.258	Asbestos Cement
715	P-118	J-114	J-115	108.00	200	120.00	0.90	0.03	0.001	0.008	PVC
716	P-9	J-5	J-10	137.00	200	120.00	-2.27	0.07	0.007	0.049	PVC
718	P-229	J-217	J-218	31.00	300	120.00	7.63	0.11	0.002	0.062	PVC
719	P-265	J-241	PMP-103	2.00	600	120.00	48.52	0.17	0	0.074	PVC
720	P-210	J-200	J-201	211.00	300	120.00	-5.40	0.08	0.007	0.033	PVC
721	P-232	J-220	J-221	94.00	300	120.00	-4.47	0.06	0.002	0.023	PVC
722	P-32	J-30	J-31	86.00	300	110.00	-14.97	0.21	0.022	0.26	Asbestos Cement
723	P-108	J-96	J-105	160.00	200	120.00	0.14	0	0	0	PVC
724	P-133	J-126	J-127	125.00	150	120.00	0.60	0.03	0.002	0.017	PVC
725	P-174	J-164	J-165	87.00	300	120.00	-8.87	0.13	0.007	0.083	PVC
726	P-134	J-127	J-128	116.00	150	120.00	0.51	0.03	0.001	0.013	PVC
727	P-190	J-180 (Dummy)	J-181	119.00	350	120.00	0.03	0	0	0	PVC
728	P-211	J-201	J-202	129.00	360	120.00	0.94	0.01	0	0	HDPE
729	P-300	OLD FIRE PUMP	J-265	145.00	300	120.00	0.00	0	0	0	PVC
730	P-144	J-122	J-137	191.00	200	120.00	-0.63	0.02	0.001	0.004	PVC
731	P-231	J-219	J-220	100.00	300	120.00	-4.23	0.06	0.002	0.022	PVC
732	P-70	J-65	J-66	106.00	300	110.00	4.38	0.06	0.003	0.027	Asbestos Cement
733	P-35	J-33	J-34	60.00	300	110.00	-19.74	0.28	0.024	0.433	Asbestos Cement
734	P-117	J-113	J-114	51.00	200	120.00	-0.45	0.01	0	0.001	PVC
735	P-184	J-175	J-177	34.00	200	120.00	-0.79	0.03	0	0.007	PVC
736	P-112	J-108	J-109	88.00	200	120.00	-0.14	0	0	0.001	PVC
737	P-150	J-141	J-143	23.00	150	120.00	0.00	0	0	0	PVC
738	P-177	J-167	J-168	458.00	300	120.00	-6.35	0.09	0.018	0.045	PVC
739	P-115	J-97	Lakeshore	143.00	200	120.00	-0.30	0.01	0	0.001	PVC
740	P-192	J-182	J-183	257.00	350	120.00	-3.12	0.03	0.001	0.006	PVC
741	P-251	J-235	J-236	2.00	400	120.00	55.25	0.44	0.001	0.595	PVC
742	P-68	J-63	Acheson Zone 3	124.00	300	110.00	4.61	0.07	0.004	0.029	Asbestos Cement
743	P-309	J-469	J-468 (Dummy)	89.00	300	120.00	-4.77	0.07	0.002	0.027	PVC
744	P-146	J-128	J-139	63.00	150	120.00	0.10	0.01	0	0	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
745	P-97	J-93	J-94	73.00	200	120.00	-0.16	0.01	0	0	PVC
746	P-237	J-224	J-226	96.00	300	120.00	1.42	0.02	0	0.002	PVC
747	P-128	J-121	J-122	38.00	200	120.00	-1.41	0.04	0.001	0.021	PVC
748	P-22	J-21	J-22	200.00	300	110.00	-10.86	0.15	0.029	0.143	Asbestos Cement
749	P-122	J-117	J-118	130.00	200	120.00	-0.21	0.01	0	0.001	PVC
750	P-230	J-183	J-219	149.00	300	120.00	-4.16	0.06	0.003	0.021	PVC
751	P-104	J-100	J-101	111.00	200	120.00	0.31	0.01	0	0.001	PVC
753	P-61	J-57	J-58	116.00	300	110.00	5.59	0.08	0.005	0.042	Asbestos Cement
754	P-126	J-114	J-120	75.00	200	120.00	-1.37	0.04	0.001	0.019	PVC
755	P-28	J-22	J-27	72.00	300	110.00	-14.82	0.21	0.019	0.255	Asbestos Cement
756	P-44	J-42	J-43	77.00	300	110.00	9.27	0.13	0.008	0.107	Asbestos Cement
757	P-197	J-187	J-188	74.00	300	120.00	1.47	0.02	0	0.003	PVC
758	P-20	J-19	J-20	49.00	300	110.00	-10.73	0.15	0.008	0.14	Asbestos Cement
759	P-80	J-75	J-76	179.00	200	120.00	-1.82	0.06	0.006	0.032	PVC
760	P-261	J-241	J-242	2.00	600	120.00	55.25	0.2	0	0.074	PVC
761	P-298	J-234	J-265	2.00	300	120.00	0.00	0	0	0	PVC
762	P-102	J-98	J-99	87.00	200	120.00	0.65	0.02	0	0.005	PVC
763	P-254	J-238	PMP-105	2.00	250	120.00	0.00	0	0	0	PVC
764	P-291	J-192	J-264	218.00	300	120.00	-5.39	0.08	0.007	0.033	PVC
765	P-281	J-14	J-259	44.00	300	120.00	28.13	0.4	0.047	0.711	PVC
766	P-64	J-60	J-40	31.00	300	110.00	0.51	0.01	0	0	Asbestos Cement
767	P-3	J-3	J-4	65.00	300	120.00	-7.76	0.11	0.004	0.065	PVC
768	P-83	J-78	J-79	214.00	250	120.00	0.18	0	0	0	PVC
769	P-14	J-14	J-15	120.00	300	110.00	-19.07	0.27	0.038	0.407	Asbestos Cement
770	P-58	J-54	J-55	167.00	300	110.00	12.49	0.18	0.031	0.185	Asbestos Cement
771	P-55	J-51	J-52	57.00	300	110.00	12.59	0.18	0.01	0.187	Asbestos Cement
772	P-167	J-157	J-158	22.00	250	120.00	-7.15	0.15	0.003	0.138	PVC
773	P-137	J-130	J-131	98.00	200	120.00	-2.00	0.06	0.004	0.038	PVC
774	P-105	J-101	J-102	98.00	200	120.00	0.18	0.01	0	0.001	PVC
775	P-101	J-97	J-98	173.00	200	120.00	0.74	0.02	0.001	0.006	PVC
776	P-188	J-178	J-179	247.00	350	120.00	-3.56	0.04	0.002	0.007	PVC
777	P-228	J-217	J-66	67.00	300	120.00	-7.63	0.11	0.004	0.064	PVC
778	P-38	J-36	J-37	94.00	300	110.00	12.91	0.18	0.019	0.198	Asbestos Cement
779	P-41	J-39	J-40	154.00	300	110.00	12.89	0.18	0.031	0.197	Asbestos Cement
780	P-154	J-145	J-146	133.00	200	120.00	-2.83	0.09	0.009	0.073	PVC
781	P-63	J-59	J-60	123.00	300	110.00	0.51	0.01	0	0.001	Asbestos Cement
782	P-164	J-149	J-156	36.00	200	120.00	0.37	0.01	0	0.002	PVC
784	P-287	J-257	J-255	556.00	200	120.00	-0.77	0.02	0.003	0.007	HDPE
785	P-59	J-55	J-56 (Dummy)	74.00	300	110.00	7.65	0.11	0.006	0.075	Asbestos Cement
786	P-243	J-231	J-73	144.00	200	120.00	0.32	0.01	0	0.002	PVC
787	P-264	J-242	PMP-102	2.00	600	120.00	27.62	0.1	0	0.037	PVC
788	P-7	J-7	J-8	371.00	300	120.00	-5.52	0.08	0.013	0.035	PVC
789	P-268	R-1	J-239	2.00	600	120.00	103.76	0.37	0.001	0.26	PVC
790	P-88	J-83	J-84	56.00	200	120.00	-0.53	0.02	0	0.004	PVC
791	P-121	J-116	J-117	92.00	200	120.00	-0.10	0	0	0.001	PVC
792	P-79	J-74	J-75	142.00	200	120.00	-2.09	0.07	0.006	0.042	PVC
793	P-24	J-23	J-24	158.00	300	110.00	3.89	0.05	0.003	0.021	Asbestos Cement
794	P-47	J-45	J-46	103.00	300	110.00	13.78	0.19	0.021	0.223	Asbestos Cement
795	P-31	J-29	J-30	83.00	300	110.00	-14.91	0.21	0.021	0.258	Asbestos Cement
796	P-196	J-186	J-187	92.00	300	120.00	1.53	0.02	0	0.004	PVC
797	P-107	J-94	J-104	107.00	200	120.00	-0.96	0.03	0.001	0.01	PVC
799	P-161	J-152	J-153	68.00	200	120.00	0.47	0.01	0	0.002	PVC
800	P-250	J-234	J-235	2.00	400	120.00	27.62	0.22	0	0.186	PVC
801	P-136	J-129	J-130	187.00	200	120.00	-1.92	0.06	0.007	0.035	PVC
802	P-27	J-26	J-16	95.00	300	110.00	19.26	0.27	0.042	0.414	Asbestos Cement
803	P-173	J-163	J-164	99.00	300	120.00	-7.45	0.11	0.006	0.061	PVC
804	P-66	J-61	J-62	112.00	300	110.00	4.72	0.07	0.003	0.031	Asbestos Cement
805	P-284	J-68	J-255	311.00	200	120.00	1.64	0.05	0.009	0.027	HDPE
806	P-257	PMP-102	J-235	2.00	150	120.00	27.62	1.56	0.04	20.129	PVC
807	P-218	J-207	J-208	408.00	300	120.00	6.43	0.09	0.02	0.046	PVC
808	P-239	J-227	J-228	96.00	300	120.00	-0.26	0	0	0	PVC
809	P-18	J-18	J-8	31.00	300	110.00	-0.98	0.01	0	0	Asbestos Cement
811	P-130	J-123	J-124	65.00	200	120.00	-0.85	0.03	0.001	0.008	PVC
812	P-143	J-136	J-126	89.00	200	120.00	1.59	0.05	0.002	0.025	PVC
813	P-93	J-88	J-89	68.00	200	120.00	-2.13	0.07	0.002	0.042	PVC
814	P-207	J-197	J-198	121.00	300	120.00	0.67	0.01	0	0.001	PVC
815	P-149	J-141	J-142	40.00	150	120.00	0.00	0	0	0	PVC
816	P-259	J-239	J-240	2.00	600	120.00	103.76	0.37	0.001	0.298	PVC
817	P-34	J-32	J-33	60.00	300	110.00	-19.73	0.28	0.028	0.434	Asbestos Cement
818	P-85	J-80 (Dummy)	J-81	125.00	250	120.00	-1.86	0.04	0.001	0.011	PVC
819	P-256	PMP-103	J-236	2.00	200	120.00	48.52	1.54	0.028	14.064	PVC
820	P-183	J-174	J-175	119.00	200	120.00	-0.72	0.02	0.001	0.006	PVC
821	P-266	J-240	PMP-104	2.00	600	120.00	0.00	0	0	0	PVC
822	P-111	J-107	J-108	99.00	200	120.00	-0.10	0	0	0	PVC
823	P-308(2)	J-470	J-469	207.00	300	120.00	-4.77	0.07	0.005	0.027	PVC
824	P-233	J-221	J-222	79.00	300	120.00	-4.47	0.06	0.002	0.024	PVC
825	P-175	J-165	J-166	352.00	300	120.00	-19.02	0.27	0.102	0.345	PVC
826	P-53	J-50	J-31	149.00	300	110.00	-4.68	0.07	0.004	0.03	Asbestos Cement
827	P-96	J-86	J-92	190.00	200	120.00	0.07	0	0	0	PVC
828	P-191	J-181	J-182	234.00	350	120.00	-1.92	0.02	0	0.002	PVC
831	P-145	J-138	J-128	73.00	150	120.00	0.00	0	0	0	PVC
832	P-273	J-218	J-246	35.00	300	120.00	7.63	0.11	0.002	0.065	PVC
833	P-185	J-177	J-170	76.00	200	120.00	0.00	0	0	0	PVC
834	P-213	J-201	J-203	142.00	300	120.00	-6.34	0.09	0.007	0.045	PVC
835	P-114	J-110	J-111	107.00	200	120.00	0.14	0	0	0	PVC
836	P-178	J-168	J-169	64.00	300	120.00	-8.71	0.12	0.01	0.081	PVC
837	P-151	J-143	J-144	26.00	150	120.00	0.00	0	0	0	PVC
838	P-67	J-62	J-63	99.00	300	110.00	4.72	0.07	0.003	0.031	Asbestos Cement
839	P-310(2)	J-468 (Dummy)	J-467	69.00	300	120.00	-6.82	0.1	0.004	0.051	PVC
840	P-42	J-40	J-41	91.00	300	110.00	9.36	0.13	0.01	0.109	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
841	P-123	J-109	J-119	21.00	200	120.00	0.64	0.02	0	0.007	PVC
842	P-12	J-12	J-13	89.00	300	120.00	-2.65	0.04	0.001	0.01	PVC
843	P-127	J-120	J-121	205.00	200	120.00	-1.37	0.04	0.004	0.019	PVC
844	P-39	J-37	J-38	110.00	300	110.00	12.90	0.18	0.022	0.197	Asbestos Cement
845	P-198	J-76	J-189	340.00	250	120.00	-2.00	0.04	0.004	0.013	PVC
846	P-21	J-20	J-21	62.00	300	110.00	-10.75	0.15	0.009	0.141	Asbestos Cement
847	P-252	J-236	J-237	2.00	400	120.00	103.76	0.83	0.004	1.972	PVC
848	P-81	J-76	J-77	87.00	250	120.00	0.18	0	0	0	PVC
849	P-293	J-264	J-261	179.00	300	120.00	-7.21	0.1	0.009	0.057	PVC
850	P-236	J-224	J-225	82.00	300	120.00	2.04	0.03	0	0.005	PVC
851	P-69	Acheson Zone 3	J-65	123.00	300	110.00	4.38	0.06	0.003	0.027	Asbestos Cement
852	P-65	J-55	J-61	151.00	300	110.00	4.75	0.07	0.005	0.031	Asbestos Cement
853	P-4	J-4	J-5	124.00	300	120.00	-7.76	0.11	0.008	0.066	PVC
854	P-168	J-158	J-159	265.00	300	120.00	-7.15	0.1	0.015	0.056	PVC
855	P-56	J-52	J-53	70.00	300	110.00	12.59	0.18	0.014	0.189	Asbestos Cement
856	P-139	J-132	J-133	106.00	200	120.00	0.65	0.02	0.001	0.005	PVC
857	P-36	J-34	J-35	61.00	300	110.00	-19.74	0.28	0.029	0.434	Asbestos Cement
858	P-103	J-99	J-100	157.00	200	120.00	0.47	0.01	0	0.002	PVC
859	P-98	J-94	J-95	59.00	200	120.00	0.79	0.03	0	0.006	PVC
860	P-116	Lakeshore	J-113	107.00	200	120.00	-0.45	0.01	0	0.003	PVC
861	P-305(2)	J-262	J-472	275.00	300	120.00	-4.59	0.06	0.006	0.025	PVC
863	P-165	J-156	J-152	29.00	200	120.00	0.37	0.01	0	0.003	PVC
864	P-221	J-210	J-211	208.00	300	120.00	-21.29	0.3	0.088	0.425	PVC
865	P-60	J-56 (Dummy)	J-57	133.00	300	110.00	5.60	0.08	0.006	0.042	Asbestos Cement
866	P-244	J-135	J-232	151.00	200	120.00	-1.39	0.04	0.003	0.02	PVC
867	P-106	J-102	J-103	82.00	200	120.00	0.10	0	0	0	PVC
868	P-269	J-35	J-244	73.00	350	120.00	-45.45	0.47	0.02	0.819	PVC
869	P-89	J-84	J-85	64.00	200	120.00	-0.55	0.02	0	0.004	PVC
870	P-25	J-24	J-25 (Dummy)	124.00	300	110.00	3.88	0.05	0.003	0.022	Asbestos Cement
871	P-23	J-22	J-23	47.00	300	110.00	3.92	0.06	0.001	0.021	Asbestos Cement
872	P-37	J-35	J-36	106.00	300	110.00	12.91	0.18	0.021	0.197	Asbestos Cement
873	P-43	J-41	J-42	45.00	300	110.00	9.32	0.13	0.005	0.108	Asbestos Cement
874	P-19	J-18	J-19	89.00	300	110.00	-10.73	0.15	0.012	0.14	Asbestos Cement
876	P-77	J-70	J-73	144.00	200	120.00	-2.23	0.07	0.007	0.046	PVC
877	P-94	J-89	J-90	141.00	200	120.00	-2.18	0.07	0.007	0.045	PVC
878	P-260	J-240	J-241	2.00	600	120.00	103.76	0.37	0.001	0.26	PVC
879	P-267	J-239	PMP-105	2.00	600	120.00	0.00	0	0	0	PVC
880	P-297	J-243	OLD FIRE PUMP	4.00	500	120.00	0.00	0	0	0	PVC
881	P-253	J-237	J-238	2.00	400	120.00	103.76	0.83	0.004	1.972	PVC
882	P-186	J-176	J-177	48.00	200	120.00	0.79	0.03	0	0.008	PVC
883	P-86	J-81	J-82	220.00	200	120.00	0.94	0.03	0.002	0.009	PVC
884	P-274	J-246	J-247	370.00	300	120.00	21.29	0.3	0.156	0.424	PVC
885	P-214	J-203	J-204	29.00	300	120.00	-6.56	0.09	0.001	0.046	PVC
886	P-311(2)	J-467	J-466	82.00	300	120.00	-7.19	0.1	0.005	0.056	PVC
887	P-194	J-184	J-185	66.00	300	120.00	1.88	0.03	0	0.005	PVC
888	P-40	J-38	J-39	44.00	300	110.00	12.89	0.18	0.009	0.198	Asbestos Cement
889	P-199	J-189	J-190	318.00	300	120.00	-9.44	0.13	0.031	0.094	PVC
890	P-162	J-153	J-154	39.00	200	120.00	0.39	0.01	0	0.002	PVC
891	P-82	J-77	J-78	43.00	250	120.00	0.18	0	0	0	PVC
892	P-54	J-35	J-51	62.00	300	110.00	12.79	0.18	0.012	0.194	Asbestos Cement
893	P-57	J-53	J-54	91.00	300	110.00	12.50	0.18	0.017	0.187	Asbestos Cement
894	P-99	J-95	J-96	66.00	200	120.00	0.76	0.02	0	0.007	PVC
895	P-166	J-147	J-157	23.00	200	120.00	-7.10	0.23	0.01	0.401	PVC
896	P-222	J-211	J-212	47.00	300	120.00	0.00	0	0	0	PVC
897	P-245	J-133	J-233	76.00	200	120.00	0.11	0	0	0	PVC
898	P-1	J-1	J-2	158.00	300	120.00	-7.16	0.1	0.01	0.056	PVC
899	P-90	J-85	J-86	140.00	200	120.00	-1.85	0.06	0.004	0.033	PVC
900	P-13	J-13	J-14	30.00	300	110.00	9.05	0.13	0.005	0.103	Asbestos Cement
901	P-48	J-46	J-47	139.00	300	110.00	13.78	0.19	0.032	0.223	Asbestos Cement
903	P-155	J-146	J-147	23.00	200	120.00	-2.83	0.09	0.002	0.072	PVC
904	P-302(2)	J-259	J-461	628.00	300	120.00	27.78	0.39	0.235	0.695	PVC
905	P-240	J-208	J-230	357.00	300	120.00	-2.54	0.04	0.003	0.008	PVC
906	P-187	J-168	J-178	363.00	350	120.00	-3.37	0.04	0.002	0.007	PVC
907	P-262	J-242	J-243	2.00	600	120.00	27.62	0.1	0	0.037	PVC
908	P-275	J-247	J-248	75.00	300	120.00	21.29	0.3	0.032	0.425	PVC
909	P-312(2)	J-466	J-465	94.00	300	120.00	-7.19	0.1	0.005	0.057	PVC
910	P-153	J-145	J-132	114.00	200	120.00	0.72	0.02	0.001	0.006	PVC
911	P-62	J-58	J-59	127.00	300	110.00	2.34	0.03	0.001	0.008	Asbestos Cement
912	P-163	J-154	J-155	61.00	200	120.00	0.29	0.01	0	0.001	PVC
913	P-208	J-198	J-199	68.00	300	120.00	0.02	0	0	0	PVC
914	P-100	J-96	J-97	141.00	200	120.00	0.53	0.02	0	0.003	PVC
915	P-91	J-86	J-87	166.00	200	120.00	-1.99	0.06	0.006	0.038	PVC
916	P-49	J-47	J-26	98.00	300	110.00	13.77	0.19	0.021	0.223	Asbestos Cement
917	P-314(2)	J-464	J-230	207.00	300	120.00	2.57	0.04	0.002	0.009	PVC
918	P-242	J-229	J-230	45.00	250	120.00	-0.03	0	0	0	PVC
919	P-6	J-7	J-6	24.00	200	120.00	0.02	0	0	0	PVC
920	P-263	J-243	PMP-101	2.00	600	120.00	27.62	0.1	0	0.037	PVC
921	P-2	J-2	J-3	142.00	300	120.00	-7.50	0.11	0.008	0.062	PVC
922	P-180	J-171	J-172	67.00	200	120.00	1.44	0.05	0.001	0.021	PVC
923	P-50	J-44	J-48	97.00	300	110.00	-4.57	0.06	0.003	0.028	Asbestos Cement
924	P-169	J-159	J-160	124.00	300	120.00	-7.15	0.1	0.007	0.056	PVC
925	P-315(2)	J-465	J-464	45.00	300	120.00	-7.19	0.1	0.002	0.056	PVC
926	P-87	J-82	J-83	149.00	200	120.00	-0.41	0.01	0	0.002	PVC
927	P-51	J-48	J-49	123.00	300	110.00	-4.57	0.06	0.004	0.029	Asbestos Cement
928	P-170	J-160	J-161	104.00	300	120.00	-5.91	0.08	0.004	0.039	PVC
929	P-179	J-163	J-171	113.00	200	120.00	1.54	0.05	0.003	0.024	PVC
930	P-113	J-231	J-125	185.00	200	120.00	-0.32	0.01	0	0.001	PVC
931	P-203	J-125	J-209	180.00	200	120.00	0.10	0	0	0	PVC
932	P-204	J-125	J-214	107.00	200	120.00	0.00	0	0	0	PVC
933	P-205	J-193	J-215	201.00	300	120.00	6.53	0.09	0.01	0.048	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
934	P-219	J-26	J-216	167.00	200	110.00	-3.67	0.12	0.023	0.139	Asbestos Cement
935	P-303	J-193	J-274	39.00	300	120.00	-7.24	0.1	0.002	0.057	PVC
936	P-305	J-274	J-194	198.00	200	120.00	0.09	0	0	0	PVC
937	P-306	J-189	J-274	249.00	300	120.00	7.32	0.1	0.015	0.059	PVC
938	P-307	J-228	J-275	314.00	300	120.00	-0.42	0.01	0	0	PVC
940	P-310	J-188	J-276	110.00	300	120.00	1.47	0.02	0	0.003	PVC
941	P-311	J-276	J-182	265.00	300	120.00	-1.09	0.02	0	0.002	PVC
942	P-312	J-276	J-277	170.00	300	120.00	2.52	0.04	0.001	0.008	PVC
944	P-314	J-278	J-279 (Dummy)	172.00	300	120.00	-13.66	0.19	0.033	0.187	PVC
945	P-315	J-279 (Dummy)	J-280	255.00	300	120.00	-15.71	0.22	0.055	0.242	PVC
946	P-413	J-369	J-9	217.00	300	120.00	-7.94	0.11	0.012	0.068	PVC
947	P-463	J-119	J-413	36.00	150	120.00	0.37	0.02	0	0.006	PVC
948	P-464	J-413	J-118	118.00	200	120.00	0.37	0.01	0	0.001	PVC
949	P-466	J-414	J-263	264.00	300	120.00	8.74	0.12	0.017	0.081	PVC
950	P-467	J-8	J-415	209.00	300	120.00	-6.61	0.09	0.01	0.049	PVC
952	P-469	J-262	J-416	50.00	300	120.00	8.75	0.12	0.006	0.081	PVC
953	P-470	J-416	J-414	71.00	300	120.00	8.75	0.12	0.006	0.082	PVC
954	P-471	J-244	J-417	188.00	600	120.00	58.32	0.21	0.033	0.094	HDPE
955	P-472	J-417	J-418	70.00	600	120.00	43.15	0.15	0.003	0.053	PVC
956	P-483	J-216	J-426	467.00	200	110.00	-3.67	0.12	0.066	0.139	Asbestos Cement
957	P-485	J-427	J-66	310.00	200	110.00	0.03	0	0	0	Asbestos Cement
958	P-491	R-3	J-432	2.00	350	120.00	115.12	1.2	0.009	4.576	PVC
959	P-492	J-432	PMP-1	2.00	350	120.00	115.13	1.2	0.009	4.539	PVC
960	P-493	PMP-1	J-281	2.00	350	120.00	115.13	1.2	0.009	4.539	PVC
961	P-494	J-238	PRV-4	3.00	350	120.00	103.76	1.08	0.011	3.76	PVC
962	P-495	PRV-4	J-244	3.00	350	120.00	103.76	1.08	0.011	3.76	PVC
963	P-496	PRV-5	J-280	37.00	400	120.00	115.12	0.92	0.293	2.383	PVC
964	P-497	J-281	PRV-5	2.00	400	120.00	115.13	0.92	0.005	2.381	PVC
965	P-500	J-433	J-427	244.00	200	110.00	0.32	0.01	0	0.002	Asbestos Cement
966	P-501	J-40	J-433	147.00	300	110.00	4.03	0.06	0.003	0.023	Asbestos Cement
967	P-502	J-225	J-317	106.00	300	120.00	2.04	0.03	0.001	0.006	PVC
968	P-529	J-461	J-542	318.00	300	120.00	27.70	0.39	0.088	0.691	PVC
971	P-536	J-202	J-183	115.00	350	120.00	0.94	0.01	0	0.001	PVC
972	P-597	J-232	J-455	163.00	200	120.00	0.12	0	0	0.001	PVC
973	P-598	J-137	J-456	53.00	200	120.00	-0.76	0.02	0	0.007	PVC
974	P-599	J-456	J-457	147.00	200	120.00	1.23	0.04	0.002	0.016	PVC
975	P-600	J-457	J-458	105.00	200	120.00	0.02	0	0	0	PVC
976	P-601	J-458	J-459	75.00	200	120.00	0.00	0	0	0	PVC
977	P-602	J-457	J-460	112.00	200	120.00	0.04	0	0	0	PVC
978	P-603	J-457	J-462	99.00	200	120.00	1.12	0.04	0.001	0.013	PVC
979	P-604	J-462	J-473	83.00	200	120.00	1.10	0.03	0.001	0.012	PVC
982	P-607	J-263	J-261	199.00	300	120.00	5.84	0.08	0.008	0.039	PVC
983	P-608	J-263	J-474	104.00	300	120.00	2.89	0.04	0.001	0.01	PVC
984	P-609	J-155	J-475	48.00	200	120.00	0.22	0.01	0	0	PVC
985	P-610	J-475	J-476	99.00	200	120.00	0.22	0.01	0	0.003	PVC
986	P-611	J-476	J-477	118.00	200	120.00	0.22	0.01	0	0.001	PVC
987	P-612	J-477	J-478	106.00	200	120.00	0.11	0	0	0	PVC
988	P-613	J-478	J-479	100.00	200	120.00	0.05	0	0	0	PVC
989	P-614	J-479	J-480	106.00	200	120.00	0.05	0	0	0	PVC
990	P-615	J-478	Country Squire	134.00	200	120.00	0.01	0	0	0	PVC
991	P-616	Country Squire	J-482	51.00	200	120.00	0.00	0	0	0	PVC
992	P-617	J-483	J-88	77.00	200	120.00	0.00	0	0	0	PVC
993	P-618	J-255	J-484	74.00	300	120.00	-1.47	0.02	0	0.003	PVC
994	P-619	J-484	J-485	90.00	300	120.00	-1.54	0.02	0	0.003	PVC
995	P-620	J-485	Greenbriar	149.00	300	120.00	-1.57	0.02	0	0.004	PVC
996	P-621	Greenbriar	J-487	95.00	300	120.00	-1.68	0.02	0.001	0.004	PVC
997	P-622	J-487	J-488	146.00	300	120.00	-1.73	0.02	0	0.004	PVC
998	P-623	J-488	J-489	137.00	300	120.00	-1.73	0.02	0.001	0.004	PVC
999	P-624	J-489	J-490	161.00	300	120.00	2.57	0.04	0.001	0.009	PVC
1000	P-625	J-490	J-491	59.00	300	120.00	2.09	0.03	0.001	0.006	PVC
1001	P-626	J-472	J-492	200.00	300	120.00	0.18	0	0	0	PVC
1003	P-628	J-493	J-494	221.00	300	120.00	3.87	0.05	0.005	0.018	PVC
1004	P-631	J-496	J-701	290.00	300	120.00	3.87	0.05	0.003	0.018	PVC
1006	P-633	J-494	J-496	395.00	300	120.00	3.87	0.05	0.003	0.018	PVC
1007	P-634	J-256	J-499	159.00	200	120.00	0.09	0	0	0	HDPE
1008	P-635	J-125	J-500	208.00	200	120.00	-0.54	0.02	0.001	0.004	PVC
1009	P-636	J-500	J-193	123.00	200	120.00	-0.62	0.02	0.001	0.004	PVC
1012	P-639	J-75	J-502	104.00	200	120.00	-0.45	0.01	0	0.002	PVC
1013	P-640	J-502	J-503	95.00	200	120.00	-0.51	0.02	0	0.003	PVC
1014	P-641	J-503	J-504	118.00	200	120.00	-0.59	0.02	0	0.004	PVC
1015	P-642	J-504	J-505	103.00	200	120.00	-0.67	0.02	0.001	0.005	PVC
1016	P-643	J-75	J-506	84.00	200	120.00	0.17	0.01	0	0.001	PVC
1017	P-644	J-506	J-507	147.00	200	120.00	0.10	0	0	0	PVC
1018	P-533	J-426	J-433	198.00	200	110.00	-3.67	0.12	0.028	0.139	Asbestos Cement
1021	P-439	J-513	J-167	152.00	300	120.00	-19.02	0.27	0.042	0.345	HDPE
1023	P-441	J-148	J-338	252.00	200	120.00	1.05	0.03	0.003	0.012	PVC
1024	P-443	J-339	J-232	126.00	200	120.00	1.51	0.05	0.003	0.022	PVC
1025	P-445	J-340	J-341	74.00	200	120.00	0.08	0	0	0.001	PVC
1026	P-446	J-338	J-342	79.00	200	120.00	0.98	0.03	0.001	0.01	PVC
1027	P-447	J-342	J-340	138.00	200	120.00	-0.24	0.01	0	0.001	PVC
1028	P-448	J-342	J-343	127.00	200	120.00	1.22	0.04	0.002	0.015	PVC
1029	P-449	J-343	J-344	109.00	200	120.00	0.82	0.03	0.001	0.008	PVC
1030	P-450	J-344	J-345	88.00	200	120.00	0.82	0.03	0.001	0.007	PVC
1031	P-451	J-345	J-346	107.00	200	120.00	0.00	0	0	0	PVC
1032	P-452	J-255	J-347	531.00	300	120.00	2.27	0.03	0.003	0.007	HDPE
1034	P-454	J-347	J-348	255.00	200	120.00	0.97	0.03	0.002	0.01	PVC
1036	P-456	J-349	J-350	241.00	250	120.00	0.62	0.01	0	0.001	PVC
1037	P-457	J-350	J-351	254.00	250	120.00	-0.91	0.02	0.001	0.003	PVC
1038	P-458	J-351	J-352	307.00	250	120.00	-2.09	0.04	0.004	0.014	PVC
1039	P-459	J-352	J-353	190.00	250	120.00	-2.09	0.04	0.002	0.014	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1040	P-460	J-353	J-491	195.00	250	120.00	-2.09	0.04	0.003	0.014	PVC
1042	P-462	J-354	J-355	173.00	300	120.00	10.07	0.14	0.018	0.106	PVC
1057	P-499	J-511	J-372	586.00	250	120.00	-3.91	0.08	0.008	0.045	PVC
1058	P-504	J-176	J-373	101.00	200	120.00	-1.17	0.04	0.001	0.014	PVC
1059	P-505	J-373	J-374	144.00	200	120.00	-1.17	0.04	0.002	0.014	PVC
1060	P-506	J-374	J-375	147.00	200	120.00	-1.41	0.04	0.003	0.02	PVC
1061	P-507	J-375	J-164	158.00	200	120.00	-1.41	0.04	0.003	0.02	PVC
1062	P-508	J-165	J-376	357.00	200	120.00	4.65	0.15	0.062	0.183	PVC
1065	P-513	J-380	J-460	90.00	300	120.00	0.00	0	0	0	PVC
1066	P-514	J-91	J-381	67.00	200	120.00	-2.33	0.07	0.003	0.052	PVC
1067	P-515	J-381	J-382	353.00	200	120.00	-2.33	0.07	0.017	0.051	PVC
1069	P-517	J-473	J-104	80.00	200	120.00	1.10	0.03	0.001	0.013	PVC
1073	P-524	J-384	J-385	986.00	350	120.00	-15.55	0.16	0.086	0.112	PVC
1075	P-527	J-387	J-280	912.00	350	120.00	-78.05	0.81	2.014	2.223	PVC
1077	P-530	J-389	J-669	661.00	250	120.00	-9.24	0.19	0.097	0.22	PVC
1087	P-548	J-400	Supreme Steel	629.00	300	120.00	-7.08	0.1	0.025	0.055	PVC
1103	P-573	J-424	J-425	398.00	300	120.00	17.69	0.25	0.077	0.301	PVC
1107	P-577	J-206	J-224	304.00	322	120.00	8.18	0.1	0.016	0.051	HDPE
1108	P-580	J-173	J-429	273.00	200	120.00	1.77	0.06	0.008	0.031	PVC
1109	P-581	J-429	J-160	203.00	200	120.00	1.24	0.04	0.003	0.016	PVC
1116	P-588	J-435	J-436	431.00	200	120.00	-0.10	0	0	0	PVC
1117	P-589	J-436	J-455	232.00	200	120.00	-0.10	0	0	0	PVC
1118	P-590	J-340	J-437	148.00	200	120.00	-0.62	0.02	0.001	0.004	PVC
1119	P-591	J-437	J-339	102.00	200	120.00	1.63	0.05	0.003	0.026	PVC
1120	P-593	J-438	J-147	134.00	300	120.00	-2.51	0.04	0.001	0.008	PVC
1124	P-630	J-505	J-82	489.00	200	120.00	-0.80	0.03	0.003	0.007	PVC
1137	P-664	J-385	PRV-16	32.00	350	120.00	-24.74	0.26	0.06	0.265	PVC
1138	P-665	PRV-16	J-386	969.00	350	120.00	-24.74	0.26	0.226	0.265	PVC
1143	P-678	J-511	J-510	93.00	250	120.00	3.91	0.08	0.015	0.045	PVC
1158	P-693	J-169	J-388	745.00	300	120.00	-10.33	0.15	0.054	0.111	PVC
1162	P-697	J-446	PMP-2	2.00	350	120.00	0.00	0	0	0	PVC
1163	P-698	PMP-2	J-447	2.00	350	120.00	0.00	0	0	0	PVC
1169	P-705	J-449	J-208	166.00	300	120.00	-8.96	0.13	0.012	0.085	PVC
1171	P-707	Supreme Steel	J-450	178.00	410	120.00	-3.15	0.02	0.001	0.003	HDPE
1172	P-708	J-450	J-1	334.00	400	120.00	-3.15	0.03	0.001	0.003	PVC
1174	P-710	J-343	J-452	68.00	200	120.00	0.21	0.01	0	0.001	PVC
1175	P-711	J-437	J-453	67.00	200	120.00	-2.25	0.07	0.003	0.048	PVC
1176	P-712	J-453	J-438	139.00	300	120.00	-2.44	0.03	0.001	0.008	PVC
1181	P-718	J-463	J-400	489.00	300	120.00	0.50	0.01	0	0	PVC
1185	P-722	J-607	J-463	437.00	300	120.00	6.06	0.09	0.018	0.042	PVC
1186	P-723	J-418	J-495	222.00	600	120.00	43.15	0.15	0.016	0.054	PVC
1190	P-727	J-514	J-417	673.00	300	120.00	-15.17	0.21	0.087	0.227	PVC
1191	P-728	J-402	J-509	260.00	300	120.00	7.38	0.1	0.039	0.06	PVC
1192	P-729	J-509	J-412	472.00	400	120.00	-0.03	0	0	0	PVC
1203	P-735	J-449	J-515	810.00	250	120.00	3.73	0.08	0.014	0.041	PVC
1206	P-737	J-425	J-516	666.00	300	120.00	17.69	0.25	0.052	0.301	PVC
1211	P-740	J-424	J-518	0.00	300	120.00	0.00	0	0	0	PVC
1213	P-741	J-390	J-519	897.00	400	120.00	1.03	0.01	0	0	PVC
1216	P-743	J-373	J-520	0.00	200	120.00	0.00	0	0	0	PVC
1218	P-744	J-348	J-521	448.00	200	120.00	0.72	0.02	0.001	0.006	PVC
1219	P-745	J-521	J-349	448.00	200	120.00	0.72	0.02	0.001	0.006	PVC
1222	P-746	J-521	J-523	0.00	200	120.00	0.00	0	0	0	PVC
1224	P-747	J-349	J-524	0.00	250	120.00	0.00	0	0	0	PVC
1226	P-748	J-351	J-525	0.00	200	120.00	0.00	0	0	0	PVC
1248	P-754	J-495	J-529	560.00	600	120.00	22.00	0.08	0.001	0.015	PVC
1251	P-756	J-529	J-530	0.00	600	120.00	21.46	0.08	0.002	0.015	PVC
1253	P-757	J-530	J-531	0.00	600	120.00	21.46	0.08	0.003	0.015	PVC
1255	P-758	J-531	J-532	0.00	600	120.00	20.31	0.07	0.002	0.014	PVC
1256	P-759	J-532	J-390	0.00	600	120.00	20.31	0.07	0.002	0.013	PVC
1257	P-760	J-390	J-495	0	600	120	-21.15	0.07	0.009	0.014	PVC
1262	P-762	PRV-A	J-535	185	300	120	20.25	0.29	0.027	0.387	PVC
1263	P-763	J-535	Panattoni	185	300	120	10.19	0.14	0.02	0.109	PVC
1275	P-770	J-536	J-540	0	300	120	0	0	0	0	PVC
1277	P-771	J-541	J-536	0	300	120	3.1	0.04	0.002	0.012	PVC
1280	P-773	J-542	PRV-A	0	300	120	20.25	0.29	0.038	0.388	PVC
1287	P-778	J-547	J-541	0	300	120	3.1	0.04	0.007	0.012	PVC
1294	P-782	J-536	J-547	0	300	120	-4.34	0.06	0.009	0.022	PVC
1295	P-783	J-547	J-542	0	350	120	-7.45	0.08	0.011	0.029	PVC
1304	P-789	J-1	J-550	0	350	120	3.47	0.04	0.002	0.007	PVC
1309	P-792	J-82	J-552	0	200	120	0.56	0.02	0	0.004	PVC
1311	P-793	J-345	J-553	288	200	120	0.68	0.02	0.001	0.006	PVC
1312	P-794	J-553	J-435	288	200	120	0.68	0.02	0.001	0.005	PVC
1314	P-795	J-197	J-554	247	300	120	-4.93	0.07	0.005	0.028	PVC
1315	P-796	J-554	J-200	247	300	120	-6.25	0.09	0.003	0.044	PVC
1316	P-797	J-261	J-554	0	200	120	-1.31	0.04	0.013	0.018	PVC
1318	P-798	J-261	J-555	401	300	120	-0.06	0	0	0	PVC
1319	P-799	J-555	J-196	401	300	120	-4.11	0.06	0.006	0.02	PVC
1324	P-801	J-555	J-558	0	200	120	0	0	0	0	PVC
1325	P-802	J-558	J-556	0	200	120	0	0	0	0	PVC
1326	P-803	J-557	J-558	0	200	120	0	0	0	0	PVC
1331	P-806	J-168	J-560	1,219	350	120	-3.59	0.04	0.004	0.007	PVC
1334	P-808	J-246	J-561	359	322	120	-13.66	0.17	0.024	0.132	HDPE
1335	P-809	J-561	J-278	359	300	120	-13.66	0.19	0.032	0.186	PVC
1337	P-810	J-277	J-562	362	300	120	4.43	0.06	0.005	0.023	PVC
1338	P-811	J-562	J-451	362	300	120	4.39	0.06	0.003	0.023	PVC
1340	P-812	J-451	J-563	0	300	120	4.15	0.06	0.006	0.021	PVC
1343	P-814	J-563	J-564	0	300	120	3.36	0.05	0.005	0.014	PVC
1344	P-815	J-564	J-167	0	300	120	3.36	0.05	0.003	0.014	PVC
1346	P-816	J-275	J-565	618	300	120	1.68	0.02	0.001	0.004	PVC
1347	P-817	J-565	J-180 (Dummy)	618	300	120	5.64	0.08	0.014	0.036	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1349	P-818	J-275	J-566	785	300	120	-2.12	0.03	0.001	0.006	PVC
1350	P-819	J-614	J-388	785	300	120	-7.7	0.11	0.041	0.065	PVC
1352	P-820	J-566	J-567	0	300	120	0.04	0	0	0	PVC
1354	P-821	J-262	J-568	797	300	120	-4.16	0.06	0.01	0.021	PVC
1355	P-822	J-568	J-449	797	300	120	-4.59	0.06	0.01	0.025	PVC
1357	P-823	Panattoni	J-569	726	300	120	9.76	0.14	0.008	0.1	PVC
1361	P-826	J-570	J-464	726	300	120	9.76	0.14	0.022	0.1	PVC
1364	P-828	J-571	J-570	726	300	120	9.76	0.14	0.01	0.1	PVC
1368	P-830	J-573	Supreme Steel	1,001	400	120	3.94	0.03	0.001	0.005	PVC
1374	P-834	J-575	J-369	589	300	120	-7.86	0.11	0.01	0.067	PVC
1376	P-835	J-424	J-576	899	400	120	22.22	0.18	0.028	0.113	PVC
1386	P-837	J-454	J-577	0	300	120	1.71	0.02	0	0.004	PVC
1388	P-838	J-569	J-578	726	300	120	9.76	0.14	0.026	0.1	PVC
1389	P-839	J-578	J-571	726	300	120	9.76	0.14	0.007	0.1	PVC
1391	P-840	J-497	J-579	41	300	120	3.34	0.05	0.002	0.014	PVC
1392	P-841	J-579	J-498	41	300	120	0	0	0	0	PVC
1396	P-842	J-579	J-582	959	300	120	3.34	0.05	0.002	0.014	PVC
1406	P-848	J-576	J-586	899	400	120	20.88	0.17	0.029	0.101	PVC
1411	P-851	J-280	J-588	1,451	400	120	20.74	0.17	0.049	0.1	PVC
1426	P-857	PRV-15	J-591	974	350	120	-28.27	0.29	0.114	0.339	PVC
1427	P-858	J-591	J-387	974	350	120	-27.16	0.28	0.171	0.315	PVC
1430	P-860	J-592	J-577	0	300	120	-1.71	0.02	0.001	0.004	PVC
1450	P-871	J-371	J-601	444	300	120	0.67	0.01	0	0.001	PVC
1451	P-872	J-601	J-350	444	300	120	-1.53	0.02	0.001	0.003	PVC
1453	P-873	J-347	J-602	818	300	120	1.3	0.02	0.001	0.002	HDPE
1454	P-874	J-602	J-252	818	300	120	1.3	0.02	0.001	0.002	HDPE
1460	P-878	J-489	J-604	428	300	120	-4.32	0.06	0.005	0.022	PVC
1461	P-879	J-604	J-215	428	300	120	-6.53	0.09	0.01	0.047	PVC
1474	P-884	J-481	J-607	0	300	120	6.06	0.09	0.015	0.041	PVC
1476	P-885	J-508	J-608	503	300	120	14.3	0.2	0.031	0.203	PVC
1479	P-887	J-608	J-609	0	300	120	0	0	0	0	PVC
1481	P-888	J-391 (Dummy)	J-610	624	400	120	13.46	0.11	0.019	0.045	PVC
1482	P-889	J-610	J-508	624	300	120	11.85	0.17	0.03	0.143	PVC
1484	P-890	J-415	J-611	176	300	120	-6.61	0.09	0.005	0.049	PVC
1485	P-891	J-611	J-9	176	300	120	-6.61	0.09	0.001	0.047	PVC
1491	P-895	J-432	J-447	0	350	120	0	0	0	0	PVC
1493	P-896	J-446	CV-2	1	350	120	0	0	0	0	PVC
1494	P-897	CV-2	J-281	1	350	120	0	0	0	0	PVC
1501	P-901	J-613	J-384	1,219	350	120	-12.55	0.13	0.028	0.075	PVC
1505	P-904	J-565	J-614	0	300	120	-3.96	0.06	0.004	0.019	PVC
1506	P-905	J-614	J-566	0	300	120	2.17	0.03	0.001	0.006	PVC
1528	P-914	J-619	J-671	1,187	350	120	-19.14	0.2	0.074	0.165	PVC
1549	P-927	J-610	J-439	356	300	120	1.04	0.01	0.001	0.001	PVC
1553	P-929	J-412	J-626	720	400	120	-0.03	0	0	0	PVC
1560	P-933	J-508	J-629	1,206	400	120	5.09	0.04	0.003	0.008	PVC
1561	P-934	J-629	J-628	1,206	400	120	5.09	0.04	0.003	0.007	PVC
1574	P-941	J-354	J-535	0	300	120	-10.07	0.14	0.039	0.106	PVC
1580	P-944	J-439	J-624	0	300	120	-4.09	0.06	0.008	0.02	PVC
1605	P-946	J-493	J-632	0	300	120	-10.07	0.14	0.009	0.106	PVC
1606	P-947	J-632	J-355	0	300	120	-10.07	0.14	0.056	0.106	PVC
1613	P-949	J-382	PRV-24	465	200	120	-4.65	0.15	0.067	0.183	PVC
1614	P-950	PRV-24	J-377	465	200	120	-4.65	0.15	0.023	0.182	PVC
1615	P-951	J-376	J-377	0	200	120	4.65	0.15	0.062	0.183	PVC
1620	P-954	J-628	J-634	906	400	120	5.09	0.04	0.001	0.007	PVC
1626	P-959	J-402	J-635	0	300	120	-7.38	0.1	0.019	0.06	PVC
1682	P-967	J-516	J-642	666	400	120	17.69	0.14	0.007	0.074	PVC
1683	P-968	J-642	J-393	666	400	120	17.69	0.14	0.005	0.074	PVC
1712	P-971	J-382	J-644	0	200	120	2.32	0.07	0.015	0.051	PVC
1743	P-540(2)	J-647	J-393	848	400	120	-4.04	0.03	0.002	0.005	PVC
1745	P-974	J-647	J-648 (Dummy)	0	300	120	2.27	0.03	0.002	0.007	PVC
1747	P-975	J-648 (Dummy)	J-649	0	300	120	0.22	0	0	0	PVC
1749	P-540(1)(1)	J-392	J-650	848	400	120	0.51	0	0	0	PVC
1750	P-540(1)(2)	J-650	J-647	848	400	120	-1.78	0.01	0	0.001	PVC
1751	P-976	J-649	J-650	0	300	120	-2.29	0.03	0.002	0.007	PVC
1794	P-691(1)	J-166	J-651	105	350	120	-19.02	0.2	0.017	0.162	PVC
1795	P-691(2)	J-651	PRV-2i	1	76	120	-19.02	4.19	0.277	276.82	PVC
1797	P-438(1)	PRV-2i	J-652	1	76	120	-19.02	4.19	0.277	276.82	PVC
1798	P-438(2)	J-652	J-513	118	350	120	-19.02	0.2	0.019	0.163	PVC
1807	P-531(1)	J-207	J-653	39	300	120	-21.17	0.3	0.016	0.42	PVC
1808	P-531(2)	J-653	PRV-Bi	1	100	120	-21.17	2.7	0.089	88.627	PVC
1810	P-532(1)	PRV-Bi	J-654	1	100	120	-21.17	2.7	0.089	88.627	PVC
1811	P-532(2)	J-654	J-210	144	300	120	-21.17	0.3	0.06	0.42	PVC
1816	P-246(1)	J-190	J-655	43	300	120	-9.44	0.13	0.004	0.095	PVC
1817	P-246(2)	J-655	PRV-1i	1	76	120	-9.44	2.08	0.076	75.53	PVC
1819	P-247(1)	PRV-1i	J-656	1	76	120	-9.44	2.08	0.076	75.53	PVC
1820	P-247(2)	J-656	J-191	166	265	120	-9.44	0.17	0.029	0.172	HDPE
1825	P-605(1)	J-456	J-657	123	200	120	-1.99	0.06	0.005	0.038	PVC
1826	P-605(2)	J-657	PRV-21i	1	76	120	-1.99	0.44	0.004	4.242	PVC
1828	P-606(1)	PRV-21i	J-658	1	76	120	-1.99	0.44	0.004	4.242	PVC
1829	P-606(2)	J-658	J-140	37	200	120	-1.99	0.06	0.001	0.038	PVC
1834	P-131(1)	J-124	J-659	15	200	120	-0.85	0.03	0	0.01	PVC
1835	P-131(2)	J-659	PRV-3i	1	50	120	-0.85	0.43	0.007	6.697	PVC
1837	P-132(1)	PRV-3i	J-660	1	50	120	-0.85	0.43	0.007	6.697	PVC
1838	P-132(2)	J-660	J-126	64	200	120	-0.85	0.03	0.001	0.008	PVC
1858	P-989	J-83	J-662	0	200	120	0.12	0	0	0	PVC
1860	P-990	J-85	J-663	0	200	120	0.15	0	0	0	PVC
1861	P-991	J-277	J-181	0	300	120	-1.93	0.03	0.001	0.005	PVC
1883	P-854(1)	J-589	J-666	120	250	120	-5.51	0.11	0.01	0.084	PVC
1884	P-854(2)	J-666	PRV-19i	1	76.2	120	-5.51	1.21	0.028	27.533	PVC
1886	P-680(1)	PRV-19i	J-667	1	76.2	120	-5.51	1.21	0.028	27.533	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1887	P-680(2)	J-667	J-165	61	300	120	-5.51	0.08	0.002	0.034	PVC
1931	P-790(1)	J-550	J-668	0	350	120	2.71	0.03	0.001	0.004	PVC
1932	P-790(2)	J-668	J-454	0	350	120	1.96	0.02	0	0.002	PVC
1934	P-662(1)	J-388	J-669	44	300	120	-19.02	0.27	0.042	0.345	PVC
1935	P-662(2)	J-669	PRV-15	44	350	120	-28.27	0.29	0.073	0.339	PVC
1937	P-995	J-169	J-670	0	250	120	1.62	0.03	0.004	0.009	PVC
1939	P-844(1)	J-387	J-671	0	350	120	26.39	0.27	0.147	0.298	PVC
1940	P-844(2)	J-671	J-584	0	350	120	1.29	0.01	0	0.001	PVC
1942	P-913(1)	J-386	J-672	1,187	350	120	-24.74	0.26	0.108	0.265	PVC
1945	P-955(1)	J-634	J-673	906	350	120	2.7	0.03	0.001	0.004	PVC
1948	P-996	J-674	J-672	0	350	120	11.81	0.12	0.024	0.067	PVC
1950	P-831(1)	J-481	J-675	1,001	400	120	7.43	0.06	0.003	0.015	PVC
1951	P-831(2)	J-675	J-574	1,001	400	120	5.92	0.05	0.002	0.01	PVC
1953	P-886(1)	J-608	J-676	503	400	120	14.29	0.11	0.008	0.05	PVC
1954	P-886(2)	J-676	J-481	503	400	120	13.83	0.11	0.007	0.047	PVC
1960	P-955(2)(1)	J-673	J-681	906	350	120	1.7	0.02	0.001	0.002	PVC
1962	P-997	J-678	J-677	0	300	120	1.7	0.02	0.001	0.004	PVC
1963	P-998	J-678	J-679	0	300	120	-1.7	0.02	0.001	0.004	PVC
1964	P-999	J-681	J-679	0	350	120	1.7	0.02	0.001	0.002	PVC
1966	P-490(1)	J-253	J-682	280	200	120	1.24	0.04	0.002	0.016	PVC
1967	P-490(2)	J-682	J-371	280	200	120	0.67	0.02	0.001	0.005	PVC
1973	P-1000	J-683	J-474	0	300	120	-2.89	0.04	0.001	0.011	PVC
1975	P-627(1)	J-492	J-685	233	300	120	0.14	0	0	0	PVC
1976	P-627(2)	J-685	J-493	233	300	120	-3.23	0.05	0.002	0.013	PVC
1978	P-734(2)(1)	J-684	J-686	669	300	120	-1.28	0.02	0.001	0.002	PVC
1979	P-734(2)(2)	J-686	J-493	669	300	120	-2.97	0.04	0.002	0.011	PVC
1981	P-833(1)	J-508	J-687	589	300	120	-7.54	0.11	0.014	0.062	PVC
1982	P-833(2)	J-687	J-575	589	300	120	-7.86	0.11	0.013	0.067	PVC
1984	P-725(1)	J-9	J-688	642	300	120	-14.58	0.21	0.05	0.211	PVC
1985	P-725(2)	J-688	J-514	642	300	120	-15.04	0.21	0.104	0.223	PVC
1987	P-849(1)	J-586	J-689	899	400	120	20.8	0.17	0.01	0.1	PVC
1988	P-849(2)	J-689	J-391 (Dummy)	899	400	120	19.6	0.16	0.022	0.09	PVC
1990	P-428(1)	J-81	J-690	1,571	250	120	-2.8	0.06	0.006	0.024	PVC
1991	P-428(2)	J-690	J-510	1,571	250	120	-3.91	0.08	0.014	0.045	PVC
1993	P-853(1)	J-372	J-691	581	250	120	-3.91	0.08	0.01	0.045	PVC
1994	P-853(2)	J-691	J-589	581	250	120	-5.51	0.11	0.017	0.084	PVC
1996	P-286(1)	J-256	J-692	219	200	120	-0.18	0.01	0	0	HDPE
1997	P-286(2)	J-692	J-257	219	200	120	-0.75	0.02	0.001	0.006	HDPE
1999	P-76(1)	J-71	J-693	166	200	120	0.17	0.01	0	0	PVC
2000	P-76(2)	J-693	J-72	166	200	120	0.09	0	0	0	PVC
2003	P-988(2)	J-694	J-200	0	200	120	0.85	0.03	0.002	0.008	PVC
2005	P-988(1)(1)	J-515	J-695	0	200	120	3.59	0.11	0.018	0.113	PVC
2006	P-988(1)(2)	J-695	J-694	0	200	120	2.1	0.07	0.008	0.042	PVC
2010	P-956(1)	J-392	J-697	0	400	120	-0.55	0	0	0	PVC
2011	P-956(2)	J-697	J-634	0	400	120	-2.39	0.02	0	0.002	PVC
2013	P-832(1)	J-574	J-698	1,001	400	120	4.42	0.04	0.002	0.006	PVC
2014	P-832(2)	J-698	J-573	1,001	400	120	4.09	0.03	0	0.004	PVC
2016	P-571(1)	J-390	J-699	201	400	120	40.18	0.32	0.071	0.339	PVC
2017	P-571(2)	J-699	J-424	201	400	120	39.99	0.32	0.055	0.336	PVC
2026	P-948(2)	J-701	J-497	0	300	120	3.87	0.05	0.003	0.018	PVC
2028	P-957(1)	J-588	J-702	1,451	400	120	19.54	0.16	0.012	0.089	PVC
2029	P-957(2)	J-702	J-635	1,451	300	120	19.54	0.28	0.225	0.362	PVC
2049	P-900(1)	J-560	J-709	1,219	350	120	-3.94	0.04	0.001	0.009	PVC
2050	P-900(2)	J-709	J-613	1,219	350	120	-3.94	0.04	0.001	0.009	PVC
2056	P-1007	J-670	J-389	0	250	120	-1.19	0.02	0.003	0.005	PVC
2057	P-1008	J-624	J-391 (Dummy)	0	300	120	-4.09	0.06	0.011	0.02	PVC
2058	P-1009	J-677	J-649	0	300	120	-2.51	0.04	0.002	0.008	PVC
2065	P-913(2)(1)	J-672	J-713	1,187	350	120	-12.94	0.13	0.026	0.08	PVC
2066	P-913(2)(2)	J-713	J-619	1,187	350	120	-12.94	0.13	0.033	0.08	PVC
2072	P-1016(1)	J-584	J-715	0	300	120	1.29	0.02	0.001	0.002	PVC
2073	P-1016(2)	J-715	J-696	0	300	120	1.29	0.02	0.003	0.002	PVC
2094	P-1018	J-387	J-718	0	350	120	24.51	0.25	0.171	0.26	PVC
2095	P-1019	J-718	J-591	0	350	120	1.11	0.01	0	0.001	PVC
2096	P-1020	J-718	J-674	0	350	120	23.4	0.24	0.085	0.239	PVC
2144	P-687(2)	J-719	J-626	807	400	120	0.03	0	0	0	PVC
2146	P-687(1)(1)	J-393	J-720	807	400	120	0.03	0	0	0	PVC
2147	P-687(1)(2)	J-720	J-719	807	400	120	0.03	0	0	0	PVC
2149	P-1029	J-111	J-721	0	200	120	0	0	0	0	PVC
2150	P-1030	J-168	J-167	0	350	120	9.31	0.1	0.018	0.043	PVC
2154	P-1032	J-555	J-723	0	300	120	4.05	0.06	0.003	0.019	PVC
2156	P-1033	J-723	J-724	0	300	120	4.05	0.06	0.003	0.02	PVC
2158	P-1034	J-724	J-725	0	300	120	4.05	0.06	0.005	0.02	PVC
2159	P-1035	J-725	J-192	0	300	120	4.05	0.06	0.006	0.019	PVC

AECOM

Appendix F

Long Term System Simulation Results

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
185	J-160	584,027.01	5,934,838.88	678.02	0	79.20	733.81
186	J-222	582,145.56	5,932,813.74	700.26	0	63.50	744.98
187	J-162	583,810.38	5,934,670.57	685.00	0	69.30	733.81
188	J-138	584,613.67	5,935,181.42	678.38	0	78.70	733.80
189	J-192	581,191.96	5,933,912.97	677.56	0	95.70	744.98
190	J-119	584,936.53	5,935,869.14	667.10	0	70.90	717.01
191	J-134	584,764.89	5,935,072.26	680.51	0.03	75.60	733.80
192	J-67	581,650.04	5,931,561.40	710.00	0	76.10	763.62
193	J-38	581,243.76	5,931,279.09	710.00	0.01	76.00	763.51
194	J-41	581,141.03	5,931,480.63	710.00	0.01	76.00	763.51
195	J-144	584,396.66	5,935,219.39	675.00	0	83.50	733.80
196	J-37	581,243.76	5,931,168.95	710.00	0	75.90	763.51
197	J-472	580,740.47	5,933,183.14	689.91	0	78.20	744.99
198	J-201	581,815.00	5,933,229.15	690.13	0	77.90	744.98
199	J-91	582,694.12	5,935,128.13	660.00	0	79.70	716.16
200	J-103	585,091.20	5,936,277.99	665.00	0.03	73.80	717.01
201	J-53	581,438.28	5,930,980.15	710.00	0.03	76.00	763.53
202	J-40	581,233.98	5,931,482.32	710.00	0	76.00	763.52
203	J-107	584,778.23	5,935,996.97	664.16	0	75.00	717.01
204	J-212	581,825.45	5,932,053.99	710.00	0	76.30	763.72
205	J-197	581,603.91	5,933,472.82	685.44	0	84.50	744.98
206	J-159	584,150.38	5,934,848.85	679.15	0	77.60	733.80
207	J-163	583,696.80	5,934,580.94	685.00	0	69.30	733.81
208	J-92	582,355.13	5,935,027.71	660.00	0.02	79.70	716.13
209	J-90	582,616.55	5,935,084.61	660.00	0.05	79.70	716.15
210	J-111	585,098.38	5,935,794.30	672.05	0.05	63.80	717.01
211	J-177	583,865.02	5,934,178.46	693.29	0	57.50	733.81
212	J-471	580,745.35	5,933,130.74	690.00	0	78.10	744.99
213	J-233	584,681.75	5,934,979.21	681.75	0.04	73.90	733.80
214	68 (Dum	580,952.95	5,932,747.92	698.59	0.68	65.90	744.99
215	J-1	579,511.27	5,931,168.86	705.00	0.18	82.90	763.43
216	J-174	583,865.88	5,934,330.48	690.60	0.04	61.30	733.81
218	J-131	584,433.28	5,934,995.60	679.54	0.04	77.00	733.80
219	J-100	584,835.40	5,936,162.83	665.00	0.05	73.80	717.01
220	J-75	581,067.83	5,934,963.64	655.66	0	85.80	716.10
221	J-60	581,268.02	5,931,483.28	710.00	0	76.00	763.53
222	J-217	581,836.74	5,931,627.98	710.00	0	76.20	763.71
223	J-146	584,443.42	5,934,865.47	686.39	0	67.30	733.80
224	J-6	579,945.01	5,931,013.88	708.42	0.01	78.10	763.45
225	J-169	583,532.49	5,933,358.14	700.00	0	63.80	744.98
226	J-4	579,847.42	5,931,278.15	705.69	0	82.00	763.44
227	J-27	580,669.54	5,930,951.45	710.00	0.03	75.90	763.48
228	J-158	584,415.79	5,934,856.33	685.70	0	68.30	733.80
229	J-14	580,335.90	5,931,383.96	710.00	0	75.90	763.45
230	J-105	584,480.67	5,935,747.97	663.83	0.05	75.50	717.01
231	J-261	581,205.35	5,933,531.77	685.10	0	85.00	744.98
232	J-51	581,311.65	5,930,974.43	710.00	0.06	75.90	763.51
233	J-183	582,114.01	5,933,238.15	690.57	0	77.20	744.98

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
234	J-106	584,742.82	5,936,007.34	663.04	0.03	76.60	717.01
235	J-244	581,247.28	5,930,944.87	712.82	0	71.90	763.49
236	J-185	582,109.89	5,933,372.58	689.49	0.12	78.80	744.98
237	J-205	581,855.89	5,932,883.46	697.62	0	67.20	744.99
238	J-88	582,477.45	5,934,962.82	661.52	0.05	77.50	716.14
239	J-87	582,416.94	5,934,900.96	661.92	0	77.00	716.14
240	J-104	584,294.78	5,935,708.60	663.84	0.05	75.50	717.01
241	J-246	581,897.49	5,931,628.85	710.00	0	76.30	763.76
242	J-232	584,892.94	5,934,920.80	684.28	0	70.30	733.80
243	J-30	580,902.68	5,930,954.31	710.00	0.02	75.90	763.49
244	J-9	580,323.88	5,930,706.90	710.00	0.01	75.90	763.46
245	J-182	582,375.00	5,933,263.31	692.23	0.04	74.90	744.98
246	J-203	581,820.84	5,933,082.06	694.39	0.07	71.80	744.98
247	J-65	581,778.70	5,931,509.37	710.00	0	76.10	763.64
248	J-113	584,707.09	5,935,813.70	666.13	0	72.20	717.01
249	J-126	584,863.23	5,935,234.31	677.59	0.05	79.80	733.80
251	J-175	583,860.04	5,934,212.11	692.89	0.02	58.10	733.81
252	J-108	584,859.07	5,935,946.29	665.31	0.01	73.40	717.01
253	J-152	584,376.31	5,934,716.20	687.39	0.04	65.90	733.80
254	J-200	581,603.76	5,933,231.65	690.97	0	76.70	744.98
255	J-36	581,245.19	5,931,074.55	710.09	0	75.80	763.50
256	J-143	584,418.36	5,935,234.31	675.12	0	83.30	733.80
257	J-81	581,858.80	5,934,643.74	665.00	0	72.60	716.12
258	J-12	580,220.70	5,931,351.93	710.00	0	75.90	763.45
259	J-226	582,264.78	5,932,630.99	705.95	0.02	55.40	744.98
260	J-45	580,893.42	5,931,477.97	710.00	0.02	75.90	763.49
261	J-17	580,311.95	5,931,197.47	710.00	0	75.90	763.46
262	J-206	581,857.12	5,932,625.05	705.00	0	56.80	744.99
263	J-115	584,825.79	5,935,796.19	666.72	0.02	71.40	717.01
264	J-150	584,403.44	5,934,788.09	687.49	0	65.70	733.80
265	J-77	581,167.95	5,934,784.85	659.73	0	80.00	716.10
266	J-18	580,314.80	5,931,075.86	708.85	0	77.50	763.46
267	J-141	584,418.36	5,935,257.37	675.00	0	83.50	733.80
268	J-8	580,315.10	5,931,044.42	708.00	0.03	78.70	763.46
270	J-118	585,014.92	5,935,991.35	667.08	0.05	70.90	717.01
271	J-34	581,184.46	5,930,958.60	713.60	0	70.80	763.49
272	J-263	580,990.65	5,933,540.47	686.38	0	83.20	744.98
273	J-135	584,890.35	5,935,064.77	680.00	0.06	76.40	733.80
274	J-121	584,820.49	5,935,506.24	675.00	0.01	59.60	717.01
275	J-181	582,540.59	5,933,275.94	693.31	0.01	73.30	744.98
276	J-264	581,189.28	5,933,693.30	681.63	0.61	89.90	744.98
277	J-220	582,117.40	5,932,983.49	695.93	0.08	69.60	744.98
278	J-252	578,937.82	5,934,828.30	660.00	0.01	79.60	716.09
279	J-142	584,423.78	5,935,296.70	675.00	0	83.50	733.80
280	J-109	584,921.74	5,935,884.21	666.76	0.03	71.30	717.01
281	J-129	584,501.09	5,935,261.44	676.15	0.05	81.80	733.80
282	J-39	581,239.51	5,931,322.53	710.00	0	76.00	763.51
283	J-164	583,606.03	5,934,540.88	685.74	0	68.20	733.81

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
285	J-219	582,113.42	5,933,083.07	693.64	0.03	72.90	744.98
286	J-469	580,912.58	5,932,829.94	695.69	0	70.00	744.99
287	J-256	580,441.19	5,935,464.19	655.00	0.03	86.70	716.09
288	J-120	584,734.38	5,935,692.75	670.15	0	66.50	717.01
289	J-230	581,106.83	5,932,460.94	706.93	0	54.00	744.99
290	J-130	584,431.22	5,935,093.29	677.58	0.03	79.80	733.80
291	J-117	585,014.92	5,936,121.64	665.00	0.03	73.80	717.01
292	J-223	582,152.61	5,932,731.90	702.98	0	59.60	744.98
293	J-218	581,867.74	5,931,628.35	710.00	0	76.30	763.73
294	J-46	580,798.60	5,931,476.05	710.00	0	75.90	763.49
295	J-2	579,680.28	5,931,170.16	705.50	0.11	82.20	763.43
296	J-26	580,564.63	5,931,456.51	710.00	0.01	75.90	763.47
297	J-189	581,084.12	5,934,453.39	665.00	0.04	72.50	716.10
298	J-211	581,876.01	5,932,068.33	710.09	0	76.10	763.72
299	J-23	580,668.11	5,931,070.17	710.00	0.01	75.90	763.47
301	J-59	581,386.82	5,931,485.18	710.00	0.61	76.00	763.55
302	J-156	584,404.53	5,934,722.07	688.13	0	64.80	733.80
303	J-199	581,769.17	5,933,510.82	685.00	0.01	85.10	744.98
305	J-148	584,454.98	5,934,760.96	689.42	0.01	63.00	733.80
306	J-132	584,558.06	5,935,001.03	680.87	0.02	75.10	733.80
307	J-19	580,403.49	5,931,080.18	707.98	0	78.80	763.46
308	J-83	581,967.59	5,934,879.14	661.00	0	78.20	716.12
309	J-139	584,644.86	5,935,312.98	676.87	0.03	80.80	733.80
310	J-133	584,653.03	5,935,049.18	680.00	0.02	76.40	733.80
311	J-96	584,368.02	5,935,856.50	660.02	0.03	80.90	717.01
312	J-204	581,850.05	5,933,080.11	694.67	0	71.40	744.98
313	J-52	581,362.87	5,930,976.72	710.00	0	76.00	763.51
314	J-55	581,524.10	5,931,157.51	710.00	0.03	76.00	763.57
315	J-74	580,931.94	5,934,929.32	656.10	0	85.20	716.10
316	J-253	578,957.63	5,934,474.88	660.00	0.01	79.60	716.09
317	J-225	582,168.53	5,932,538.56	707.11	0	53.80	744.98
318	J-186	582,113.31	5,933,524.29	685.00	0	85.10	744.98
319	J-66	581,776.04	5,931,621.09	710.00	0	76.20	763.66
320	J-227	582,440.48	5,932,638.63	706.71	0.54	54.30	744.98
321	J-54	581,528.40	5,930,990.16	710.00	0	76.00	763.54
322	J-470	580,815.61	5,933,005.16	692.36	0	74.70	744.99
323	J-165	583,521.11	5,934,524.87	687.40	0	65.90	733.81
324	J-32	581,064.31	5,930,954.31	710.00	0.03	75.90	763.49
325	J-42	581,092.22	5,931,480.07	710.00	0.02	76.00	763.51
326	J-178	583,196.31	5,933,356.52	696.11	0.06	69.40	744.98
327	J-93	584,191.17	5,935,768.07	660.00	0.05	80.90	717.01
328	J-97	584,487.83	5,935,930.76	660.00	0.03	80.90	717.01
329	J-122	584,821.83	5,935,460.16	675.00	0.02	59.60	717.01
330	J-84	582,052.57	5,934,877.70	660.32	0.01	79.20	716.12
331	J-62	581,787.29	5,931,163.23	710.00	0	76.10	763.60
332	J-29	580,819.72	5,930,954.31	710.00	0.01	75.90	763.48
333	J-94	584,255.00	5,935,803.19	660.00	0	80.90	717.01
334	J-72	580,939.25	5,935,281.52	655.00	0.03	86.70	716.10

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
335	J-188	582,266.79	5,933,527.86	686.55	0	82.90	744.98
336	J-231	580,791.64	5,934,829.71	658.98	0	81.10	716.10
337	J-229	581,106.36	5,932,407.45	708.32	0.01	52.10	744.99
338	J-466	580,911.13	5,932,595.87	700.92	0	62.60	744.99
339	J-10	579,940.63	5,931,347.65	705.00	0.06	83.00	763.45
340	J-95	584,308.01	5,935,828.08	660.00	0.01	80.90	717.01
341	5 (Dumr	580,618.70	5,931,343.45	710.00	0.68	75.90	763.47
342	J-78	581,169.38	5,934,827.76	658.78	0	81.40	716.10
343	J-99	584,705.73	5,936,073.73	662.40	0.07	77.50	717.01
345	J-7	579,949.27	5,931,039.18	708.18	0	78.50	763.45
346	J-196	581,597.38	5,933,587.35	683.44	0.05	87.40	744.98
347	J-208	581,439.10	5,932,459.61	706.90	0.01	54.10	744.99
348	J-68	580,592.95	5,934,845.60	659.96	0.04	79.70	716.10
349	J-73	580,877.59	5,934,935.04	656.37	0.06	84.80	716.10
350	J-79	581,379.39	5,934,807.01	659.35	0	80.60	716.11
351	J-464	580,909.59	5,932,458.81	705.00	0	56.80	744.99
352	J-221	582,125.37	5,932,889.89	698.69	0	65.70	744.98
353	J-63	581,781.57	5,931,261.93	710.00	0.04	76.10	763.61
354	J-48	580,984.87	5,931,374.92	710.00	0	75.90	763.49
355	J-173	583,884.96	5,934,430.17	688.11	0.06	64.90	733.81
356	J-136	584,891.71	5,935,152.93	679.69	0	76.80	733.80
357	J-255	580,263.72	5,934,844.03	655.00	0.02	86.70	716.09
358	J-137	584,631.30	5,935,458.11	675.00	0.04	59.60	717.01
359	J-44	580,980.30	5,931,477.21	710.00	0	75.90	763.50
363	J-69	580,683.06	5,934,980.81	657.45	0.04	83.20	716.10
364	J-461	580,324.91	5,931,786.10	709.66	0.03	76.30	763.41
365	J-50	580,982.78	5,931,104.50	710.00	0	75.90	763.49
366	J-58	581,515.23	5,931,487.78	710.00	0.01	76.00	763.57
367	J-61	581,675.72	5,931,158.94	710.00	0.01	76.10	763.59
368	6 (Dumr	581,521.24	5,931,231.89	710.00	0.68	76.00	763.57
369	J-47	580,657.25	5,931,474.23	710.00	0.01	75.90	763.48
370	J-176	583,816.43	5,934,177.51	694.01	0.13	56.50	733.81
371	J-128	584,625.87	5,935,253.30	677.60	0.04	79.80	733.80
372	J-151	584,368.17	5,934,786.73	686.46	0.02	67.20	733.80
373	J-13	580,314.34	5,931,355.17	710.00	0.01	75.90	763.45
374	J-33	581,129.33	5,930,960.12	711.70	0	73.50	763.49
376	J-123	584,823.26	5,935,405.93	675.00	0	59.60	717.01
378	J-21	580,469.94	5,931,023.06	709.21	0.04	77.00	763.47
379	30 (Dum	582,732.45	5,933,277.32	694.69	0.68	71.40	744.98
380	J-202	581,938.04	5,933,230.80	691.08	0	76.50	744.98
381	J-168	583,530.88	5,933,486.18	696.64	0	68.60	744.97
382	J-49	580,979.92	5,931,250.39	710.00	0.04	75.90	763.49
383	J-110	584,991.94	5,935,799.82	669.94	0.04	66.80	717.01
384	J-102	585,009.28	5,936,277.18	663.86	0.03	75.50	717.01
385	J-31	580,988.50	5,930,955.74	710.00	0	75.90	763.49
386	J-147	584,453.45	5,934,840.49	687.96	0	65.10	733.80
387	J-28	580,746.77	5,930,951.45	710.00	0	75.90	763.48
388	J-24	580,662.38	5,931,227.51	710.00	0	75.90	763.47

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
389	J-465	580,908.44	5,932,502.26	705.00	0	56.80	744.99
390	J-154	584,411.58	5,934,645.67	688.86	0.03	63.80	733.80
391	J-89	582,495.94	5,935,018.15	660.81	0.02	78.50	716.14
392	J-153	584,372.24	5,934,648.39	687.96	0.03	65.10	733.80
394	J-98	584,633.48	5,936,025.02	660.29	0.03	80.50	717.01
395	J-259	580,335.37	5,931,450.69	710.00	0.12	75.90	763.44
396	J-3	579,802.82	5,931,225.65	706.10	0.09	81.40	763.44
397	J-85	582,115.29	5,934,881.39	660.25	0.38	79.30	716.12
398	J-71	580,907.63	5,935,126.70	655.00	0.03	86.70	716.10
399	J-116	585,011.03	5,936,214.00	665.00	0.03	73.80	717.01
400	J-167	583,523.26	5,933,883.17	694.49	0	71.60	744.97
401	J-70	580,800.35	5,935,056.62	655.00	0.03	86.70	716.10
402	J-43	581,021.33	5,931,478.00	710.00	0	75.90	763.50
403	J-179	582,955.94	5,933,296.73	695.00	0	70.90	744.98
406	J-224	582,174.13	5,932,629.80	705.00	0.08	56.80	744.98
407	J-35	581,249.48	5,930,968.71	712.31	0	72.70	763.50
408	J-145	584,444.72	5,934,995.00	679.73	0	76.70	733.80
409	J-170	583,875.75	5,934,103.79	694.22	0	56.20	733.81
410	J-228	582,556.63	5,932,642.20	708.46	0.05	51.80	744.98
411	J-15	580,429.24	5,931,386.27	710.00	0.06	75.90	763.46
412	eson Zo	581,783.00	5,931,386.36	710.00	0.08	76.10	763.63
413	J-262	580,997.23	5,933,183.46	691.01	0	76.60	744.99
414	J-76	581,080.70	5,934,784.85	659.39	0	80.50	716.10
415	J-82	581,851.29	5,934,868.21	661.29	0	77.80	716.12
416	J-187	582,195.09	5,933,525.99	685.61	0.02	84.30	744.98
417	J-124	584,883.57	5,935,380.79	675.00	0	59.60	717.01
418	J-86	582,250.40	5,934,884.38	660.62	0.02	78.80	716.13
419	J-101	584,926.98	5,936,225.99	665.00	0.04	73.80	717.01
420	J-140	584,498.38	5,935,323.83	675.17	0.02	83.20	733.79
422	J-198	581,719.60	5,933,471.45	685.00	0.22	85.10	744.98
423	J-248	581,903.32	5,932,070.50	710.80	0	75.10	763.72
424	J-247	581,891.92	5,931,996.23	710.54	0	75.50	763.73
426	J-5	579,945.61	5,931,212.07	706.57	0	80.70	763.44
427	J-171	583,770.32	5,934,494.96	687.57	0.03	65.60	733.81
428	J-22	580,670.19	5,931,024.49	710.00	0.01	75.90	763.47
429	J-16	580,476.44	5,931,406.30	710.00	0	75.90	763.46
430	J-184	582,112.89	5,933,307.91	690.00	0.03	78.00	744.98
431	J-57	581,518.38	5,931,364.91	710.00	0	76.00	763.57
432	J-11	580,115.27	5,931,356.66	710.00	0.07	75.90	763.45
433	J-467	580,945.04	5,932,670.20	698.68	0.12	65.70	744.99
434	J-127	584,738.45	5,935,230.24	678.28	0.03	78.80	733.80
435	J-20	580,457.07	5,931,080.27	710.00	0.01	75.90	763.46
436	J-172	583,827.64	5,934,460.07	688.49	0.03	64.30	733.81
437	J-157	584,429.91	5,934,843.88	686.75	0.01	66.80	733.80
438	J-161	583,932.31	5,934,795.27	682.13	0	73.30	733.81
439	J-114	584,722.31	5,935,766.42	668.89	0	68.30	717.01
440	J-149	584,407.51	5,934,758.25	688.05	0.02	64.90	733.80
441	akeshor	584,613.31	5,935,863.83	662.35	0.05	77.60	717.01

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
442	J-257	580,273.72	5,935,345.33	655.00	0.01	86.70	716.09
443	J-155	584,414.29	5,934,584.64	689.82	0.02	62.40	733.80
444	0 (Dumr	581,734.36	5,934,653.26	664.25	0.68	73.60	716.11
445	J-125	580,796.41	5,934,677.05	660.00	0.04	79.60	716.10
446	J-193	580,848.07	5,934,368.52	665.00	0.03	72.50	716.10
447	J-194	580,976.24	5,934,190.14	670.34	0.03	64.90	716.10
448	J-209	580,970.10	5,934,678.48	660.00	0.03	79.60	716.10
449	J-214	580,690.97	5,934,694.14	660.00	0	79.60	716.10
450	J-215	580,690.08	5,934,275.57	666.57	0	70.30	716.10
451	J-216	580,551.33	5,931,612.96	710.00	0	75.90	763.48
452	J-274	580,878.67	5,934,350.62	665.00	0	72.50	716.10
453	J-275	582,747.60	5,932,645.50	707.89	0.01	52.70	744.98
454	J-276	582,369.34	5,933,528.13	687.83	0.01	81.10	744.98
455	J-277	582,535.87	5,933,574.49	689.17	0.01	79.20	744.98
456	J-278	582,252.25	5,931,642.45	710.00	0	76.90	764.15
457	79 (Dum	582,429.55	5,931,644.90	712.34	0.68	73.90	764.38
458	J-280	582,657.75	5,931,650.26	715.00	0.21	70.50	764.68
460	J-317	582,199.34	5,932,409.79	709.00	0.68	51.10	744.98
461	preme S	579,529.45	5,930,618.12	710.00	0	75.80	763.43
462	J-369	580,329.98	5,930,530.83	711.57	0.02	73.60	763.46
463	J-413	584,962.80	5,935,893.67	667.76	0	69.90	717.01
464	J-414	580,992.55	5,933,333.24	690.00	0.01	78.00	744.98
465	J-415	580,322.26	5,930,836.93	709.65	0	76.40	763.46
466	J-416	580,996.56	5,933,257.52	690.00	0	78.00	744.99
467	J-417	581,409.37	5,930,749.49	710.00	0	75.90	763.49
468	J-418	581,473.62	5,930,748.31	710.00	0	75.90	763.49
469	J-426	581,027.60	5,931,617.03	710.00	0	76.00	763.51
470	J-427	581,474.51	5,931,632.42	711.07	0.1	74.50	763.58
472	J-433	581,230.40	5,931,623.34	710.40	0.01	75.40	763.52
473	J-455	585,032.66	5,934,913.17	682.73	0.01	72.50	733.80
474	J-456	584,578.32	5,935,458.14	674.14	0	60.90	717.01
475	J-457	584,473.57	5,935,561.72	668.91	0.02	68.30	717.01
476	J-458	584,552.88	5,935,630.17	668.40	0.01	69.00	717.01
477	J-459	584,630.33	5,935,622.09	670.00	0	66.70	717.01
478	J-460	584,399.04	5,935,479.51	669.91	0.01	66.90	717.01
479	J-462	584,407.26	5,935,625.71	666.69	0.01	71.40	717.01
480	J-473	584,318.20	5,935,632.34	665.00	0	73.80	717.01
481	J-474	580,907.43	5,933,564.98	687.95	0	81.00	744.98
482	J-475	584,394.68	5,934,582.93	689.24	0	63.30	733.80
483	J-476	584,378.97	5,934,558.28	688.81	0	63.90	733.80
484	J-477	584,385.26	5,934,422.76	691.17	0.04	60.50	733.80
485	J-478	584,452.79	5,934,337.14	695.00	0.02	55.10	733.80
486	J-479	584,456.37	5,934,203.11	695.00	0	55.10	733.80
487	J-480	584,346.35	5,934,199.50	695.00	0.02	55.10	733.80
488	untry Sq	584,451.06	5,934,432.27	692.57	0	58.50	733.80
489	J-482	584,501.53	5,934,435.28	693.17	0	57.70	733.80
490	J-483	582,554.17	5,934,938.61	663.74	0	74.40	716.14
491	J-484	580,257.71	5,934,709.77	655.00	0.03	86.70	716.09

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
492	J-485	580,164.03	5,934,700.83	655.00	0.01	86.70	716.09
493	Greenbria	580,160.09	5,934,602.78	655.28	0.04	86.30	716.09
494	J-487	580,157.19	5,934,461.58	658.62	0.01	81.60	716.09
495	J-488	580,264.39	5,934,426.70	660.00	0	79.60	716.09
496	J-489	580,262.15	5,934,273.16	662.79	0.01	75.70	716.09
497	J-490	580,263.09	5,934,169.52	664.93	0.16	72.60	716.09
498	J-491	580,263.09	5,934,052.82	668.12	0	68.10	716.09
499	J-492	580,603.96	5,933,233.91	687.77	0.02	81.20	744.98
500	J-493	580,285.22	5,933,229.98	685.12	0	85.00	744.98
501	J-494	580,019.98	5,933,222.44	681.92	0	89.50	744.98
502	J-496	579,846.07	5,933,216.09	683.33	1.91	87.50	744.98
503	J-497	579,558.48	5,933,207.86	680.78	0.18	91.10	744.97
504	J-498	579,384.04	5,933,248.61	680.76	0	91.20	744.97
505	J-499	580,585.32	5,935,532.59	655.00	0.03	86.70	716.09
506	J-500	580,800.29	5,934,469.04	664.91	0.03	72.70	716.10
507	Panatton	580,493.51	5,932,097.85	705.00	0.14	56.80	745.01
508	J-502	581,171.70	5,934,953.60	655.96	0.02	85.40	716.10
509	J-503	581,266.41	5,934,961.33	656.39	0.03	84.80	716.11
510	J-504	581,381.72	5,934,985.17	655.83	0.03	85.60	716.11
511	J-505	581,484.80	5,934,976.15	656.63	0.04	84.40	716.11
512	J-506	581,091.17	5,935,043.79	655.00	0.03	86.70	716.10
513	J-507	581,089.89	5,935,190.68	655.00	0.03	86.70	716.10
514	J-508	580,357.88	5,929,962.29	715.00	0	68.80	763.45
515	J-510	582,422.00	5,934,645.84	669.74	0	65.90	716.13
516	J-511	582,750.31	5,934,542.81	677.72	1.49	54.50	716.14
518	J-338	584,547.50	5,934,594.73	690.00	0.02	62.20	733.80
519	J-339	584,844.68	5,934,804.41	685.00	0.04	69.30	733.80
520	J-340	584,755.52	5,934,642.61	690.00	0.1	62.20	733.80
521	J-341	584,801.75	5,934,584.83	690.00	0.03	62.20	733.80
522	J-342	584,626.74	5,934,593.08	689.17	0	63.40	733.80
523	J-343	584,630.05	5,934,465.96	690.99	0.06	60.80	733.80
524	J-344	584,677.93	5,934,368.55	692.43	0	58.70	733.80
525	J-345	584,719.20	5,934,290.95	693.49	0.05	57.20	733.80
526	J-346	584,743.41	5,934,208.42	694.61	0	55.60	733.80
527	J-347	579,821.81	5,934,839.28	655.41	0	86.10	716.09
528	J-348	579,906.54	5,934,628.04	660.00	0.09	79.60	716.09
529	J-349	579,552.52	5,934,390.76	660.66	0.03	78.70	716.09
530	J-350	579,560.18	5,934,186.05	665.00	0	72.50	716.09
531	J-351	579,798.46	5,934,185.19	665.00	0.4	72.50	716.09
532	J-352	580,053.20	5,934,194.89	663.47	0	74.70	716.09
533	J-353	580,058.17	5,934,050.10	666.33	0	70.60	716.09
534	J-354	580,312.61	5,932,449.20	700.00	0	63.90	745.00
535	J-355	580,307.45	5,932,622.04	699.36	0	64.80	745.00
540	J-360	578,697.01	5,931,540.09	705.00	0	82.90	763.41
546	J-367	578,717.06	5,934,829.40	659.32	0.09	80.60	716.09
549	J-371	579,058.45	5,934,237.94	663.97	0	74.00	716.09
550	J-372	582,913.82	5,934,492.65	678.92	0	52.80	716.15
551	J-373	583,715.84	5,934,179.49	692.83	0	58.20	733.81

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
552	J-374	583,711.11	5,934,323.53	691.08	0.08	60.70	733.81
553	J-375	583,617.79	5,934,384.39	690.00	0	62.20	733.81
554	J-376	583,516.06	5,934,862.86	676.07	0.11	81.90	733.76
555	J-377	583,509.18	5,935,200.72	667.03	0	94.60	733.70
556	J-378	583,929.49	5,935,204.80	671.35	0.62	88.50	733.70
557	J-379	583,908.95	5,935,493.03	665.29	0.6	73.40	717.01
558	J-380	584,314.82	5,935,494.87	667.94	0	69.70	717.01
559	J-381	582,697.16	5,935,191.31	659.04	0	81.10	716.16
560	J-382	583,041.84	5,935,201.63	664.23	0	73.70	716.17
561	J-384	584,690.83	5,933,525.77	696.39	1	69.00	744.99
562	J-385	584,716.16	5,932,759.41	700.00	3.07	63.90	745.01
563	J-386	584,750.39	5,931,678.72	704.69	4.15	83.80	763.73
564	J-387	583,563.61	5,931,658.08	713.93	0	70.90	763.87
565	J-388	583,543.54	5,932,874.51	705.00	0.33	56.80	744.99
566	J-389	583,975.37	5,932,756.68	705.00	2.68	56.70	744.98
567	J-390	581,655.30	5,929,996.66	715.00	0.09	68.80	763.49
568	91 (Dum	580,970.38	5,929,997.16	715.00	0.68	68.80	763.46
569	J-392	580,813.36	5,929,007.00	720.00	0.01	61.70	763.46
570	J-393	581,663.98	5,929,028.48	715.00	4.54	68.80	763.49
572	J-395	580,870.63	5,928,007.60	715.77	1.92	67.70	763.44
573	J-396	579,994.03	5,927,974.61	710.79	3.7	74.70	763.43
576	J-399	579,124.50	5,929,557.08	715.00	4.49	68.70	763.42
577	J-400	579,105.90	5,930,558.91	710.00	2.53	75.80	763.42
578	J-401	579,838.42	5,929,089.06	711.05	4.38	74.30	763.42
579	J-402	582,479.98	5,930,426.58	717.66	0	65.50	763.81
580	J-403	583,291.35	5,930,024.89	715.00	0	69.20	763.77
581	J-404	584,008.12	5,930,317.94	710.00	4.3	76.30	763.77
588	J-412	582,422.40	5,929,556.63	716.72	2.1	66.60	763.63
591	J-422	582,450.12	5,928,880.13	715.00	0	68.90	763.56
593	J-424	581,660.97	5,929,623.62	713.50	0.03	71.00	763.48
594	J-425	581,665.24	5,929,366.79	715.00	0	68.80	763.49
596	J-429	584,050.71	5,934,639.34	683.04	0.18	72.10	733.81
597	J-430	584,216.79	5,934,482.79	688.98	0.23	63.60	733.80
598	J-431	584,057.80	5,934,105.74	690.03	0.01	62.10	733.80
600	J-435	584,997.94	5,934,344.14	690.00	0.26	62.20	733.80
601	J-436	585,098.32	5,934,735.10	689.76	0	62.50	733.80
602	J-437	584,749.37	5,934,767.29	686.86	0	66.60	733.80
603	J-438	584,571.05	5,934,804.08	690.00	0.03	62.20	733.80
604	J-439	580,563.59	5,929,433.52	710.00	1.71	75.90	763.46
609	J-444	582,796.35	5,930,027.09	720.00	3.24	62.10	763.77
614	J-449	581,421.38	5,932,595.83	704.53	0.21	57.40	744.99
615	J-450	579,529.68	5,930,833.39	710.00	0	75.80	763.43
616	J-451	582,718.01	5,933,794.15	686.82	0.08	82.50	744.97
617	J-452	584,568.62	5,934,437.45	692.38	0.07	58.80	733.80
618	J-453	584,709.29	5,934,821.05	685.00	0.06	69.30	733.80
619	J-454	578,967.63	5,931,180.10	705.00	0.09	82.90	763.42
620	J-463	579,109.34	5,929,955.19	715.00	1.85	68.70	763.42
621	J-481	579,912.34	5,929,983.06	710.05	0.12	75.80	763.43

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
623	J-495	581,742.29	5,930,634.26	710.00	0	75.90	763.49
624	J-514	581,024.45	5,930,758.71	710.00	0.04	75.90	763.48
625	J-509	582,414.25	5,929,796.24	715.00	2.47	69.10	763.67
1202	J-515	581,712.08	5,932,708.51	700.00	0.05	63.90	744.99
1205	J-516	581,669.94	5,929,192.84	715.00	0	68.80	763.49
1210	J-518	581,830.29	5,929,625.08	715.00	0	68.80	763.48
1212	J-519	581,835.07	5,929,999.06	715.66	0.34	67.90	763.49
1215	J-520	583,628.60	5,934,178.46	691.55	0	60.00	733.81
1217	J-521	579,709.90	5,934,475.78	661.19	0	77.90	716.09
1221	J-523	579,612.49	5,934,670.51	660.00	0	79.60	716.09
1223	J-524	579,458.36	5,934,392.85	660.00	0	79.60	716.09
1225	J-525	579,864.05	5,934,327.41	663.27	0	75.00	716.09
1247	J-529	581,722.82	5,930,546.21	711.81	0.18	73.40	763.49
1250	J-530	581,718.67	5,930,439.72	715.00	0	68.80	763.49
1252	J-531	581,695.54	5,930,265.84	715.00	0.38	68.80	763.49
1254	J-532	581,651.35	5,930,158.96	715.00	0	68.80	763.49
1261	J-535	580,317.76	5,932,082.48	705.00	0	56.80	745.01
1266	J-536	579,735.35	5,931,890.66	705.76	2.48	81.80	763.40
1268	J-537	579,384.24	5,931,741.18	705.00	0.08	82.90	763.40
1272	J-539	579,340.40	5,932,056.77	700.00	1.65	90.00	763.40
1274	J-540	579,699.30	5,932,009.28	700.12	0	89.80	763.40
1276	J-541	579,799.44	5,931,732.09	706.82	0	80.30	763.40
1279	J-542	580,321.43	5,931,912.84	706.22	0	81.20	763.40
1289	J-546	579,073.46	5,931,613.43	705.00	0.84	82.90	763.40
1293	J-547	580,088.01	5,932,060.24	705.55	0	82.10	763.40
1303	J-550	579,304.34	5,931,106.29	705.49	0.25	82.20	763.42
1308	J-552	581,774.56	5,934,875.22	660.36	0.19	79.10	716.12
1310	J-553	584,830.76	5,934,337.70	691.53	0	60.00	733.80
1313	J-554	581,603.99	5,933,308.60	689.95	0	78.10	744.98
1317	J-555	581,321.58	5,933,537.76	685.33	0	84.70	744.98
1320	J-556	581,323.99	5,933,415.23	687.59	0	81.50	744.98
1322	J-557	581,250.04	5,933,467.96	686.55	0	82.90	744.98
1323	J-558	581,327.56	5,933,467.96	686.59	0	82.90	744.98
1330	J-560	584,062.95	5,933,663.17	698.76	0.12	65.60	744.98
1333	J-561	582,080.53	5,931,638.76	710.00	0	76.50	763.93
1336	J-562	582,569.27	5,933,781.52	685	0.01	85.1	744.98
1339	J-563	583,023.88	5,933,806.52	689.56	0.27	78.7	744.97
1342	J-564	583,338.73	5,933,881.24	692.98	0	73.8	744.97
1345	J-565	582,744.06	5,932,889.49	701.99	0	61	744.98
1348	J-566	582,939.07	5,932,645.59	708.52	0.01	51.8	744.98
1351	J-567	583,002.33	5,932,556.57	709	0.01	51.1	744.98
1353	J-568	581,247.75	5,932,942.22	695.05	0.14	70.9	744.99
1356	J-569	580,577.37	5,932,096.86	705.31	0	56.3	745
1359	J-570	580,889.17	5,932,276.53	705.71	0	55.8	745
1362	J-571	580,880.65	5,932,177.12	706.82	0	54.2	745
1366	J-573	579,703.90	5,930,618.74	710	0.05	75.8	763.43
1369	J-574	579,904.79	5,930,431.14	710	0.5	75.8	763.43
1372	J-575	580,334.11	5,930,381.44	712.92	0	71.7	763.45

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1375	J-576	581,433.82	5,929,694.07	715	0.45	68.8	763.48
1385	J-577	578,886.69	5,931,210.46	705	0	82.9	763.42
1387	J-578	580,835.80	5,932,122.19	707.37	0	53.4	745
1390	J-579	579,380.19	5,933,203.20	681.18	0	90.5	744.97
1395	J-582	579,207.27	5,933,179.51	680.57	1.11	91.4	744.97
1399	J-584	583,409.70	5,930,823.23	715	0	69.3	763.79
1401	J-585	583,613.66	5,930,025.23	708.86	0	77.9	763.78
1405	J-586	581,295.24	5,929,939.38	715	0.03	68.8	763.47
1410	J-588	582,796.31	5,931,225.82	716.44	0.4	68.3	764.54
1422	J-590	582,460.14	5,928,520.74	720	3.94	61.8	763.56
1425	J-591	583,549.35	5,932,202.80	710	3.45	76.4	763.81
1428	J-592	578,708.52	5,931,205.20	706.2	0.57	81.2	763.41
1449	J-601	579,260.41	5,934,216.98	664.6	0.73	73.1	716.09
1452	J-602	579,239.65	5,934,831.22	656.38	0	84.8	716.09
1459	J-604	580,481.32	5,934,271.82	664.6	0.74	73.1	716.1
1473	J-607	579,543.45	5,929,983.64	715	0	68.7	763.43
1475	J-608	580,203.48	5,929,958.96	713.28	0	71.2	763.44
1478	J-609	580,201.01	5,929,860.38	713.35	0	71.1	763.44
1480	J-610	580,552.48	5,929,989.36	715	0.19	68.8	763.46
1483	J-611	580,325.86	5,930,727.51	710	0	75.9	763.46
1499	J-613	584,353.40	5,933,669.57	695.76	2.87	69.9	744.98
1504	J-614	582,934.11	5,932,889.06	702.94	0.52	59.7	744.98
1526	J-619	583,965.70	5,931,182.45	713.27	2.07	71.7	763.78
1529	J-620	583,426.67	5,930,620.38	719.95	0	62.2	763.79
1542	J-622	584,014.70	5,930,037.23	715	0	69.2	763.77
1545	J-623	579,142.16	5,929,148.03	715	0	68.7	763.42
1548	J-624	580,979.44	5,929,436.53	710	0	75.9	763.46
1552	J-626	582,439.40	5,929,055.55	714.43	0	69.7	763.56
1556	J-628	580,375.92	5,929,164.92	717.44	0	65.3	763.45
1559	J-629	580,365.57	5,929,526.73	705	0	83	763.45
1563	J-631	580,387.52	5,927,986.11	715	0.37	68.8	763.44
1604	J-632	580,288.92	5,933,147.51	687.49	0	81.6	744.99
1619	J-634	580,375.70	5,929,000.34	718.77	0	63.4	763.45
1623	J-635	582,786.29	5,930,481.33	720	4.05	62.3	763.88
1681	J-642	581,668.12	5,929,095.99	715	0	68.8	763.49
1711	J-644	583,046.25	5,935,496.03	657.92	0.77	82.7	716.17
1741	J-647	581,271.30	5,929,015.97	720	0	61.7	763.47
1744	48 (Dum	581,275.92	5,928,657.02	720	0.68	61.7	763.46
1746	J-649	581,116.31	5,928,684.12	720	0	61.7	763.46
1748	J-650	581,110.60	5,929,012.69	721.17	0	60	763.46
1857	J-662	581,970.85	5,935,022.33	659.84	0.04	79.9	716.12
1859	J-663	582,116.21	5,935,056.50	657.14	0.05	83.7	716.12
1930	J-668	579,102.84	5,931,112.30	705.76	0.25	81.9	763.42
1933	J-669	583,535.99	5,932,752.55	705	1.8	56.8	745
1936	J-670	583,961.86	5,933,365.46	700	0.94	63.8	744.98
1938	J-671	583,518.52	5,931,175.41	715	1.98	69.3	763.8
1941	J-672	584,343.63	5,931,657.91	705	2.03	83.4	763.76
1944	J-673	580,373.82	5,928,781.54	710.94	0.33	74.5	763.45

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1947	J-674	584,337.86	5,932,018.97	706.68	3.86	81.1	763.78
1949	J-675	579,907.29	5,930,219.27	710	0.5	75.8	763.43
1952	J-676	580,043.39	5,929,961.76	711.5	0.15	73.7	763.43
1955	J-677	581,118.82	5,928,478.68	720	1.4	61.7	763.46
1956	J-678	580,803.49	5,928,525.59	713.58	0	70.8	763.45
1957	J-679	580,802.56	5,928,372.79	716.43	0	66.7	763.45
1959	J-681	580,378.87	5,928,367.84	710	0	75.9	763.45
1965	J-682	578,966.18	5,934,323.21	662.52	0.19	76	716.09
1969	J-683	580,796.56	5,933,569.23	687.51	0.96	81.6	744.98
1970	J-684	580,269.86	5,933,725.09	675.19	0.43	99.1	744.98
1974	J-685	580,448.50	5,933,230.44	686.51	1.12	83	744.98
1977	J-686	580,280.05	5,933,437.59	680.95	0.56	90.9	744.98
1980	J-687	580,334.63	5,930,185.02	714.34	0.11	69.7	763.45
1983	J-688	580,557.45	5,930,744.75	710	0.15	75.9	763.47
1986	J-689	581,209.13	5,929,990.60	715	0.4	68.8	763.47
1989	J-690	582,115.87	5,934,642.64	664.96	0.37	72.6	716.12
1995	J-692	580,367.90	5,935,411.75	655	0.19	86.7	716.09
1998	J-693	580,939.14	5,935,207.44	655	0.03	86.7	716.1
2001	J-694	581,593.23	5,933,015.33	699.23	0.42	64.9	744.98
2004	J-695	581,706.64	5,932,861.89	698.36	0.5	66.2	744.98
2007	J-696	585,110.51	5,930,733.81	710	0.43	76.3	763.78
2009	J-697	580,594.61	5,929,003.29	722.94	0.61	57.5	763.45
2012	J-698	579,772.86	5,930,616.65	710	0.11	75.8	763.43
2015	J-699	581,656.96	5,929,786.31	715	0.06	68.8	763.49
2020	J-700	584,566.88	5,934,158.53	695	0.08	55.1	733.8
2024	J-701	579,705.90	5,933,212.88	682	0.9	89.4	744.97
2027	J-702	582,798.78	5,931,094.66	716	1.97	68.9	764.51
2030	J-703	583,042.23	5,935,001.28	669.77	0.62	65.9	716.17
2048	J-709	584,218.05	5,933,682.14	696.07	0	69.4	744.98
2064	J-713	584,319.60	5,931,332.55	708.64	0	78.3	763.77
2071	J-715	583,984.76	5,930,837.44	713.33	0	71.6	763.78
2093	J-718	583,981.82	5,932,017.05	712	0	73.5	763.81
2142	J-719	582,112.92	5,929,042.77	714.67	0	69.4	763.53
2145	J-720	581,900.54	5,929,036.19	714.83	0	69.1	763.51
2148	J-721	585,115.48	5,935,430.98	672.05	0	63.8	717.01
2153	J-723	581,364.59	5,933,637.12	683.4	0	87.4	744.98
2155	J-724	581,503.77	5,933,636.39	683.4	0	87.4	744.98
2157	J-725	581,505.07	5,933,898.96	680	0	92.2	744.98

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
654	P-120	J-102	J-116	63.00	200	120.00	-0.01	0	0	0	PVC
655	P-156	J-147	J-148	80.00	200	120.00	0.45	0.01	0	0.003	PVC
656	P-78	J-73	J-74	58.00	200	120.00	-1.37	0.04	0.001	0.018	PVC
657	P-95	J-90	J-91	95.00	200	120.00	-2.27	0.07	0.005	0.049	PVC
658	P-74	J-69	J-70	140.00	200	120.00	-0.75	0.02	0.001	0.006	PVC
659	P-201	J-191	J-192	96.00	300	120.00	0.00	0	0	0	PVC
660	P-5	J-5	J-7	173.00	200	120.00	-2.81	0.09	0.013	0.072	PVC
661	P-119	J-115	J-109	130.00	200	120.00	0.33	0.01	0	0.001	PVC
662	P-307(2)	J-471	J-470	147.00	300	120.00	-2.20	0.03	0.001	0.006	PVC
663	P-216	J-205	J-206	353.00	300	120.00	-2.41	0.03	0.002	0.007	PVC
664	P-124	J-119	J-110	95.00	200	120.00	0.09	0	0	0	PVC
665	P-17	J-17	J-18	122.00	300	110.00	-4.01	0.06	0.003	0.023	Asbestos Cement
666	P-11	J-11	J-12	113.00	300	120.00	-2.48	0.04	0.001	0.008	PVC
667	P-73	J-68	J-69	169.00	200	120.00	-0.71	0.02	0.001	0.005	PVC
668	P-235	J-223	J-224	98.00	300	120.00	-1.76	0.02	0	0.004	PVC
669	P-46	J-44	J-45	77.00	300	110.00	6.40	0.09	0.005	0.054	Asbestos Cement
670	P-152	J-131	J-145	12.00	200	120.00	-1.07	0.03	0	0.013	PVC
671	P-141	J-134	J-135	126.00	150	120.00	0.05	0	0	0	PVC
672	P-30	J-28	J-29	73.00	300	110.00	-5.84	0.08	0.003	0.046	Asbestos Cement
673	P-195	J-185	J-186	131.00	300	120.00	1.40	0.02	0	0.003	PVC
674	P-306(2)	J-472	J-471	85.00	300	120.00	-2.20	0.03	0	0.007	PVC
675	P-215	J-204	J-205	197.00	300	120.00	-2.41	0.03	0.001	0.008	PVC
676	P-159	J-150	J-151	35.00	200	120.00	0.06	0	0	0	PVC
677	P-16	J-13	J-17	156.00	300	110.00	-4.01	0.06	0.004	0.023	Asbestos Cement
678	P-160	J-151	J-152	71.00	200	120.00	0.04	0	0	0	PVC
679	P-110	J-106	J-107	37.00	200	120.00	-0.07	0	0	0	PVC
680	P-10	J-10	J-11	167.00	300	120.00	-2.41	0.03	0.001	0.007	PVC
681	P-234	J-222	J-223	81.00	300	120.00	-1.75	0.02	0	0.005	PVC
682	P-72	J-67	J-58	158.00	300	110.00	15.29	0.22	0.045	0.27	Asbestos Cement
683	P-135	J-128	J-129	126.00	150	120.00	0.27	0.02	0.001	0.004	PVC
684	P-26	J-25 (Dummy)	J-26	119.00	300	110.00	-0.23	0	0	0	Asbestos Cement
685	P-172	J-162	J-163	145.00	300	120.00	-2.21	0.03	0.001	0.007	PVC
686	P-140	J-133	J-134	114.00	200	120.00	0.08	0	0	0	PVC
687	P-158	J-149	J-150	30.00	200	120.00	0.06	0	0	0	PVC
688	P-52	J-49	J-50	146.00	300	110.00	2.34	0.03	0.001	0.009	Asbestos Cement
689	P-148	J-129	J-141	83.00	150	120.00	0.00	0	0	0	PVC
690	P-182	J-173	J-174	102.00	200	120.00	0.34	0.01	0	0.001	PVC
691	P-282	J-252	J-253	357.00	300	120.00	0.40	0.01	0	0	HDPE
692	P-217	J-206	J-207	75.00	300	120.00	-6.06	0.09	0.007	0.041	PVC
693	P-15	J-15	J-16	51.00	300	110.00	-8.42	0.12	0.005	0.09	Asbestos Cement
694	P-109	J-99	J-106	76.00	200	120.00	-0.04	0	0	0	PVC
695	P-142	J-135	J-136	88.00	200	120.00	0.76	0.02	0.001	0.007	PVC
696	P-181	J-172	J-173	65.00	200	120.00	0.82	0.03	0.001	0.008	PVC
697	P-71	J-66	J-67	156.00	300	110.00	15.29	0.22	0.04	0.27	Asbestos Cement
698	P-193	J-183	J-184	75.00	300	120.00	1.55	0.02	0	0.003	PVC
699	P-238	J-226	J-227	86.00	300	120.00	1.11	0.02	0	0.002	PVC
700	P-157	J-148	J-149	48.00	200	120.00	0.15	0	0	0	PVC
701	P-75	J-70	J-71	128.00	200	120.00	0.09	0	0	0	PVC
702	P-147	J-129	J-140	62.00	150	120.00	1.22	0.07	0.004	0.062	PVC
703	P-129	J-122	J-123	62.00	200	120.00	-0.34	0.01	0	0.001	PVC
704	P-92	J-87	J-88	83.00	200	120.00	-2.15	0.07	0.004	0.044	PVC
705	P-171	J-161	J-162	175.00	300	120.00	-2.21	0.03	0.001	0.006	PVC
706	P-206	J-196	J-197	78.00	300	120.00	0.31	0	0	0	PVC
707	P-45	J-43	J-44	40.00	300	110.00	8.78	0.12	0.004	0.098	Asbestos Cement
708	P-258	PMP-101	J-234	2.00	150	120.00	0.00	0	0	0	PVC
709	P-276	J-248	J-211	11.00	300	120.00	8.55	0.12	0.002	0.079	PVC
710	P-189	J-179	J-180 (Dummy)	237.00	350	120.00	-3.17	0.03	0.001	0.006	PVC
711	P-33	J-31	J-32	76.00	300	110.00	-3.52	0.05	0.001	0.018	Asbestos Cement
712	P-84	J-79	J-80 (Dummy)	386.00	250	120.00	-2.16	0.04	0.006	0.015	PVC
713	P-255	PMP-104	J-237	2.00	250	120.00	0.00	0	0	0	PVC
714	P-29	J-27	J-28	77.00	300	110.00	-5.84	0.08	0.003	0.045	Asbestos Cement
715	P-118	J-114	J-115	108.00	200	120.00	0.34	0.01	0	0.001	PVC
716	P-9	J-5	J-10	137.00	200	120.00	-2.35	0.07	0.007	0.052	PVC
718	P-229	J-217	J-218	31.00	300	120.00	-30.31	0.43	0.025	0.819	PVC
719	P-265	J-241	PMP-103	2.00	600	120.00	0.00	0	0	0	PVC
720	P-210	J-200	J-201	211.00	300	120.00	0.55	0.01	0	0.001	PVC
721	P-232	J-220	J-221	94.00	300	120.00	-1.75	0.02	0	0.005	PVC
722	P-32	J-30	J-31	86.00	300	110.00	-5.87	0.08	0.004	0.046	Asbestos Cement
723	P-108	J-96	J-105	160.00	200	120.00	0.05	0	0	0	PVC
724	P-133	J-126	J-127	125.00	150	120.00	0.37	0.02	0.001	0.007	PVC
725	P-174	J-164	J-165	87.00	300	120.00	-3.88	0.05	0.002	0.018	PVC
726	P-134	J-127	J-128	116.00	150	120.00	0.34	0.02	0.001	0.006	PVC
727	P-190	J-180 (Dummy)	J-181	119.00	350	120.00	-1.18	0.01	0	0.001	PVC
728	P-211	J-201	J-202	129.00	360	120.00	2.89	0.03	0.001	0.004	HDPE
729	P-300	OLD FIRE PUMP	J-265	145.00	300	120.00	0.00	0	0	0	PVC
730	P-144	J-122	J-137	191.00	200	120.00	-0.30	0.01	0	0.001	PVC
731	P-231	J-219	J-220	100.00	300	120.00	-1.67	0.02	0	0.004	PVC
732	P-70	J-65	J-66	106.00	300	110.00	-9.98	0.14	0.014	0.123	Asbestos Cement
733	P-35	J-33	J-34	60.00	300	110.00	-3.56	0.05	0.001	0.018	Asbestos Cement
734	P-117	J-113	J-114	51.00	200	120.00	-0.26	0.01	0	0	PVC
735	P-184	J-175	J-177	34.00	200	120.00	0.29	0.01	0	0	PVC
736	P-112	J-108	J-109	88.00	200	120.00	-0.08	0	0	0	PVC
737	P-150	J-141	J-143	23.00	150	120.00	0.00	0	0	0	PVC
738	P-177	J-167	J-168	458.00	300	120.00	-4.28	0.06	0.009	0.022	PVC
739	P-115	J-97	Lakeshore	143.00	200	120.00	-0.21	0.01	0	0.001	PVC
740	P-192	J-182	J-183	257.00	350	120.00	-2.98	0.03	0.001	0.005	PVC
741	P-251	J-235	J-236	2.00	400	120.00	0.00	0	0	0	PVC
742	P-68	J-63	Acheson Zone 3	124.00	300	110.00	-9.91	0.14	0.015	0.121	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
743	P-309	J-469	J-468 (Dummy)	89.00	300	120.00	-2.20	0.03	0.001	0.007	PVC
744	P-146	J-128	J-139	63.00	150	120.00	0.03	0	0	0	PVC
745	P-97	J-93	J-94	73.00	200	120.00	-0.25	0.01	0	0.001	PVC
746	P-237	J-224	J-226	96.00	300	120.00	1.13	0.02	0	0.002	PVC
747	P-128	J-121	J-122	38.00	200	120.00	-0.62	0.02	0	0.005	PVC
748	P-22	J-21	J-22	200.00	300	110.00	-5.34	0.08	0.008	0.038	Asbestos Cement
749	P-122	J-117	J-118	130.00	200	120.00	-0.08	0	0	0	PVC
750	P-230	J-183	J-219	149.00	300	120.00	-1.65	0.02	0.001	0.004	PVC
751	P-104	J-100	J-101	111.00	200	120.00	0.10	0	0	0	PVC
753	P-61	J-57	J-58	116.00	300	110.00	-2.54	0.04	0.001	0.01	Asbestos Cement
754	P-126	J-114	J-120	75.00	200	120.00	-0.61	0.02	0	0.005	PVC
755	P-28	J-22	J-27	72.00	300	110.00	-5.82	0.08	0.003	0.046	Asbestos Cement
756	P-44	J-42	J-43	77.00	300	110.00	8.78	0.12	0.007	0.096	Asbestos Cement
757	P-197	J-187	J-188	74.00	300	120.00	1.38	0.02	0	0.003	PVC
758	P-20	J-19	J-20	49.00	300	110.00	-5.30	0.07	0.002	0.037	Asbestos Cement
759	P-80	J-75	J-76	179.00	200	120.00	-0.27	0.01	0	0.001	PVC
760	P-261	J-241	J-242	2.00	600	120.00	0.00	0	0	0	PVC
761	P-298	J-234	J-265	2.00	300	120.00	0.00	0	0	0	PVC
762	P-102	J-98	J-99	87.00	200	120.00	0.17	0.01	0	0	PVC
763	P-254	J-238	PMP-105	2.00	250	120.00	0.00	0	0	0	PVC
764	P-291	J-192	J-264	218.00	300	120.00	0.11	0	0	0	PVC
765	P-281	J-14	J-259	44.00	300	120.00	9.89	0.14	0.007	0.103	PVC
766	P-64	J-60	J-40	31.00	300	110.00	12.13	0.17	0.006	0.177	Asbestos Cement
767	P-3	J-3	J-4	65.00	300	120.00	-5.16	0.07	0.002	0.03	PVC
768	P-83	J-78	J-79	214.00	250	120.00	-2.16	0.04	0.003	0.015	PVC
769	P-14	J-14	J-15	120.00	300	110.00	-8.36	0.12	0.008	0.088	Asbestos Cement
770	P-58	J-54	J-55	167.00	300	110.00	-11.68	0.17	0.027	0.164	Asbestos Cement
771	P-55	J-51	J-52	57.00	300	110.00	-11.65	0.16	0.008	0.163	Asbestos Cement
772	P-167	J-157	J-158	22.00	250	120.00	-2.45	0.05	0	0.02	PVC
773	P-137	J-130	J-131	98.00	200	120.00	-1.03	0.03	0.001	0.011	PVC
774	P-105	J-101	J-102	98.00	200	120.00	0.05	0	0	0	PVC
775	P-101	J-97	J-98	173.00	200	120.00	0.20	0.01	0	0	PVC
776	P-188	J-178	J-179	247.00	350	120.00	-3.17	0.03	0.001	0.006	PVC
777	P-228	J-217	J-66	67.00	300	120.00	30.31	0.43	0.051	0.817	PVC
778	P-38	J-36	J-37	94.00	300	110.00	-5.96	0.08	0.004	0.047	Asbestos Cement
779	P-41	J-39	J-40	154.00	300	110.00	-5.97	0.08	0.008	0.047	Asbestos Cement
780	P-154	J-145	J-146	133.00	200	120.00	-1.23	0.04	0.002	0.016	PVC
781	P-63	J-59	J-60	123.00	300	110.00	12.13	0.17	0.021	0.176	Asbestos Cement
782	P-164	J-149	J-156	36.00	200	120.00	0.08	0	0	0	PVC
784	P-287	J-257	J-255	556.00	200	120.00	-0.26	0.01	0	0.001	HDPE
785	P-59	J-55	J-56 (Dummy)	74.00	300	110.00	-1.85	0.03	0	0.005	Asbestos Cement
786	P-243	J-231	J-73	144.00	200	120.00	-0.45	0.01	0	0.003	PVC
787	P-264	J-242	PMP-102	2.00	600	120.00	0.00	0	0	0	PVC
788	P-7	J-7	J-8	371.00	300	120.00	-2.82	0.04	0.004	0.01	PVC
789	P-268	R-1	J-239	2.00	600	120.00	0.00	0	0	0	PVC
790	P-88	J-83	J-84	56.00	200	120.00	-1.67	0.05	0.002	0.028	PVC
791	P-121	J-116	J-117	92.00	200	120.00	-0.04	0	0	0	PVC
792	P-79	J-74	J-75	142.00	200	120.00	-1.37	0.04	0.003	0.019	PVC
793	P-24	J-23	J-24	158.00	300	110.00	0.45	0.01	0	0	Asbestos Cement
794	P-47	J-45	J-46	103.00	300	110.00	6.38	0.09	0.005	0.053	Asbestos Cement
795	P-31	J-29	J-30	83.00	300	110.00	-5.85	0.08	0.004	0.046	Asbestos Cement
796	P-196	J-186	J-187	92.00	300	120.00	1.40	0.02	0	0.003	PVC
797	P-107	J-94	J-104	107.00	200	120.00	-0.37	0.01	0	0.001	PVC
799	P-161	J-152	J-153	68.00	200	120.00	0.08	0	0	0	PVC
800	P-250	J-234	J-235	2.00	400	120.00	0.00	0	0	0	PVC
801	P-136	J-129	J-130	187.00	200	120.00	-1.01	0.03	0.002	0.011	PVC
802	P-27	J-26	J-16	95.00	300	110.00	8.42	0.12	0.009	0.089	Asbestos Cement
803	P-173	J-163	J-164	99.00	300	120.00	-3.11	0.04	0.001	0.012	PVC
804	P-66	J-61	J-62	112.00	300	110.00	-9.87	0.14	0.013	0.12	Asbestos Cement
805	P-284	J-68	J-255	311.00	200	120.00	0.67	0.02	0.002	0.005	HDPE
806	P-257	PMP-102	J-235	2.00	150	120.00	0.00	0	0	0	PVC
807	P-218	J-207	J-208	408.00	300	120.00	2.45	0.03	0.003	0.008	PVC
808	P-239	J-227	J-228	96.00	300	120.00	0.57	0.01	0	0.001	PVC
809	P-18	J-18	J-8	31.00	300	110.00	1.29	0.02	0	0.005	Asbestos Cement
811	P-130	J-123	J-124	65.00	200	120.00	-0.35	0.01	0	0.001	PVC
812	P-143	J-136	J-126	89.00	200	120.00	0.76	0.02	0.001	0.007	PVC
813	P-93	J-88	J-89	68.00	200	120.00	-2.20	0.07	0.003	0.046	PVC
814	P-207	J-197	J-198	121.00	300	120.00	0.23	0	0	0	PVC
815	P-149	J-141	J-142	40.00	150	120.00	0.00	0	0	0	PVC
816	P-259	J-239	J-240	2.00	600	120.00	0.00	0	0	0	PVC
817	P-34	J-32	J-33	60.00	300	110.00	-3.55	0.05	0.001	0.018	Asbestos Cement
818	P-85	J-80 (Dummy)	J-81	125.00	250	120.00	-2.84	0.06	0.003	0.025	PVC
819	P-256	PMP-103	J-236	2.00	200	120.00	0.00	0	0	0	PVC
820	P-183	J-174	J-175	119.00	200	120.00	0.31	0.01	0	0.001	PVC
821	P-266	J-240	PMP-104	2.00	600	120.00	0.00	0	0	0	PVC
822	P-111	J-107	J-108	99.00	200	120.00	-0.07	0	0	0	PVC
823	P-308(2)	J-470	J-469	207.00	300	120.00	-2.20	0.03	0.001	0.006	PVC
824	P-233	J-221	J-222	79.00	300	120.00	-1.75	0.02	0	0.004	PVC
825	P-175	J-165	J-166	352.00	300	120.00	-13.33	0.19	0.053	0.178	PVC
826	P-53	J-50	J-31	149.00	300	110.00	2.34	0.03	0.001	0.008	Asbestos Cement
827	P-96	J-86	J-92	190.00	200	120.00	0.02	0	0	0	PVC
828	P-191	J-181	J-182	234.00	350	120.00	-2.31	0.02	0.001	0.003	PVC
831	P-145	J-138	J-128	73.00	150	120.00	0.00	0	0	0	PVC
832	P-273	J-218	J-246	35.00	300	120.00	-30.31	0.43	0.024	0.817	PVC
833	P-185	J-177	J-170	76.00	200	120.00	0.85	0.03	0.001	0.008	PVC
834	P-213	J-201	J-203	142.00	300	120.00	-2.34	0.03	0.001	0.007	PVC
835	P-114	J-110	J-111	107.00	200	120.00	0.05	0	0	0.001	PVC
836	P-178	J-168	J-169	64.00	300	120.00	-4.56	0.06	0.003	0.024	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
837	P-151	J-143	J-144	26.00	150	120.00	0.00	0	0	0	PVC
838	P-67	J-62	J-63	99.00	300	110.00	-9.87	0.14	0.012	0.121	Asbestos Cement
839	P-310(2)	J-468 (Dummy)	J-467	69.00	300	120.00	-2.88	0.04	0.001	0.01	PVC
840	P-42	J-40	J-41	91.00	300	110.00	8.81	0.12	0.009	0.098	Asbestos Cement
841	P-123	J-109	J-119	21.00	200	120.00	0.22	0.01	0	0	PVC
842	P-12	J-12	J-13	89.00	300	120.00	-2.48	0.04	0.001	0.008	PVC
843	P-127	J-120	J-121	205.00	200	120.00	-0.61	0.02	0.001	0.004	PVC
844	P-39	J-37	J-38	110.00	300	110.00	-5.97	0.08	0.005	0.047	Asbestos Cement
845	P-198	J-76	J-189	340.00	250	120.00	1.89	0.04	0.004	0.012	PVC
846	P-21	J-20	J-21	62.00	300	110.00	-5.30	0.08	0.002	0.038	Asbestos Cement
847	P-252	J-236	J-237	2.00	400	120.00	0.00	0	0	0	PVC
848	P-81	J-76	J-77	87.00	250	120.00	-2.16	0.04	0.001	0.015	PVC
849	P-293	J-264	J-261	179.00	300	120.00	-0.50	0.01	0	0	PVC
850	P-236	J-224	J-225	82.00	300	120.00	0.68	0.01	0	0.001	PVC
851	P-69	Acheson Zone 3	J-65	123.00	300	110.00	-9.98	0.14	0.015	0.123	Asbestos Cement
852	P-65	J-55	J-61	151.00	300	110.00	-9.86	0.14	0.018	0.12	Asbestos Cement
853	P-4	J-4	J-5	124.00	300	120.00	-5.16	0.07	0.004	0.031	PVC
854	P-168	J-158	J-159	265.00	300	120.00	-2.45	0.03	0.002	0.008	PVC
855	P-56	J-52	J-53	70.00	300	110.00	-11.65	0.16	0.012	0.163	Asbestos Cement
856	P-139	J-132	J-133	106.00	200	120.00	0.14	0	0	0.001	PVC
857	P-36	J-34	J-35	61.00	300	110.00	-3.56	0.05	0.001	0.018	Asbestos Cement
858	P-103	J-99	J-100	157.00	200	120.00	0.15	0	0	0	PVC
859	P-98	J-94	J-95	59.00	200	120.00	0.11	0	0	0.001	PVC
860	P-116	Lakeshore	J-113	107.00	200	120.00	-0.26	0.01	0	0.001	PVC
861	P-305(2)	J-262	J-472	275.00	300	120.00	-0.32	0	0	0	PVC
863	P-165	J-156	J-152	29.00	200	120.00	0.08	0	0	0	PVC
864	P-221	J-210	J-211	208.00	300	120.00	-8.55	0.12	0.016	0.078	PVC
865	P-60	J-56 (Dummy)	J-57	133.00	300	110.00	-2.54	0.04	0.001	0.01	Asbestos Cement
866	P-244	J-135	J-232	151.00	200	120.00	-0.77	0.02	0.001	0.007	PVC
867	P-106	J-102	J-103	82.00	200	120.00	0.03	0	0	0	PVC
868	P-269	J-35	J-244	73.00	350	120.00	13.99	0.15	0.002	0.093	PVC
869	P-89	J-84	J-85	64.00	200	120.00	-1.68	0.05	0.002	0.027	PVC
870	P-25	J-24	J-25 (Dummy)	124.00	300	110.00	0.45	0.01	0	0	Asbestos Cement
871	P-23	J-22	J-23	47.00	300	110.00	0.46	0.01	0	0	Asbestos Cement
872	P-37	J-35	J-36	106.00	300	110.00	-5.96	0.08	0.005	0.047	Asbestos Cement
873	P-43	J-41	J-42	45.00	300	110.00	8.80	0.12	0.005	0.096	Asbestos Cement
874	P-19	J-18	J-19	89.00	300	110.00	-5.30	0.07	0.003	0.038	Asbestos Cement
876	P-77	J-70	J-73	144.00	200	120.00	-0.86	0.03	0.001	0.008	PVC
877	P-94	J-89	J-90	141.00	200	120.00	-2.22	0.07	0.007	0.046	PVC
878	P-260	J-240	J-241	2.00	600	120.00	0.00	0	0	0	PVC
879	P-267	J-239	PMP-105	2.00	600	120.00	0.00	0	0	0	PVC
880	P-297	J-243	OLD FIRE PUMP	4.00	500	120.00	0.00	0	0	0	PVC
881	P-253	J-237	J-238	2.00	400	120.00	0.00	0	0	0	PVC
882	P-186	J-176	J-177	48.00	200	120.00	0.57	0.02	0	0.003	PVC
883	P-86	J-81	J-82	220.00	200	120.00	-0.17	0.01	0	0	PVC
884	P-274	J-246	J-247	370.00	300	120.00	8.55	0.12	0.029	0.078	PVC
885	P-214	J-203	J-204	29.00	300	120.00	-2.41	0.03	0	0.008	PVC
886	P-311(2)	J-467	J-466	82.00	300	120.00	-3.00	0.04	0.001	0.011	PVC
887	P-194	J-184	J-185	66.00	300	120.00	1.52	0.02	0	0.002	PVC
888	P-40	J-38	J-39	44.00	300	110.00	-5.97	0.08	0.002	0.048	Asbestos Cement
889	P-199	J-189	J-190	318.00	300	120.00	0.00	0	0	0	PVC
890	P-162	J-153	J-154	39.00	200	120.00	0.11	0	0	0	PVC
891	P-82	J-77	J-78	43.00	250	120.00	-2.16	0.04	0.001	0.016	PVC
892	P-54	J-35	J-51	62.00	300	110.00	-11.58	0.16	0.01	0.162	Asbestos Cement
893	P-57	J-53	J-54	91.00	300	110.00	-11.68	0.17	0.015	0.164	Asbestos Cement
894	P-99	J-95	J-96	66.00	200	120.00	0.10	0	0	0	PVC
895	P-166	J-147	J-157	23.00	200	120.00	-2.44	0.08	0.001	0.056	PVC
896	P-222	J-211	J-212	47.00	300	120.00	0.00	0	0	0	PVC
897	P-245	J-133	J-233	76.00	200	120.00	0.04	0	0	0	PVC
898	P-1	J-1	J-2	158.00	300	120.00	-4.96	0.07	0.005	0.029	PVC
899	P-90	J-85	J-86	140.00	200	120.00	-2.11	0.07	0.006	0.042	PVC
900	P-13	J-13	J-14	30.00	300	110.00	1.53	0.02	0	0.003	Asbestos Cement
901	P-48	J-46	J-47	139.00	300	110.00	6.38	0.09	0.008	0.054	Asbestos Cement
903	P-155	J-146	J-147	23.00	200	120.00	-1.23	0.04	0	0.017	PVC
904	P-302(2)	J-259	J-461	628.00	300	120.00	9.77	0.14	0.034	0.1	PVC
905	P-240	J-208	J-230	357.00	300	120.00	-0.95	0.01	0	0.001	PVC
906	P-187	J-168	J-178	363.00	350	120.00	-3.11	0.03	0.002	0.006	PVC
907	P-262	J-242	J-243	2.00	600	120.00	0.00	0	0	0	PVC
908	P-275	J-247	J-248	75.00	300	120.00	8.55	0.12	0.006	0.078	PVC
909	P-312(2)	J-466	J-465	94.00	300	120.00	-3.00	0.04	0.001	0.011	PVC
910	P-153	J-145	J-132	114.00	200	120.00	0.16	0.01	0	0	PVC
911	P-62	J-58	J-59	127.00	300	110.00	12.74	0.18	0.025	0.193	Asbestos Cement
912	P-163	J-154	J-155	61.00	200	120.00	0.07	0	0	0	PVC
913	P-208	J-198	J-199	68.00	300	120.00	0.01	0	0	0	PVC
914	P-100	J-96	J-97	141.00	200	120.00	0.02	0	0	0	PVC
915	P-91	J-86	J-87	166.00	200	120.00	-2.15	0.07	0.007	0.044	PVC
916	P-49	J-47	J-26	98.00	300	110.00	6.38	0.09	0.005	0.053	Asbestos Cement
917	P-314(2)	J-464	J-230	207.00	300	120.00	0.96	0.01	0	0.002	PVC
918	P-242	J-229	J-230	45.00	250	120.00	-0.01	0	0	0	PVC
919	P-6	J-7	J-6	24.00	200	120.00	0.01	0	0	0	PVC
920	P-263	J-243	PMP-101	2.00	600	120.00	0.00	0	0	0	PVC
921	P-2	J-2	J-3	142.00	300	120.00	-5.07	0.07	0.004	0.03	PVC
922	P-180	J-171	J-172	67.00	200	120.00	0.86	0.03	0.001	0.008	PVC
923	P-50	J-44	J-48	97.00	300	110.00	2.38	0.03	0.001	0.009	Asbestos Cement
924	P-169	J-159	J-160	124.00	300	120.00	-2.45	0.03	0.001	0.008	PVC
925	P-315(2)	J-465	J-464	45.00	300	120.00	-3.00	0.04	0.001	0.012	PVC
926	P-87	J-82	J-83	149.00	200	120.00	-1.63	0.05	0.003	0.026	PVC
927	P-51	J-48	J-49	123.00	300	110.00	2.38	0.03	0.001	0.008	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
928	P-170	J-160	J-161	104.00	300	120.00	-2.21	0.03	0.001	0.006	PVC
929	P-179	J-163	J-171	113.00	200	120.00	0.89	0.03	0.001	0.009	PVC
930	P-113	J-231	J-125	185.00	200	120.00	0.45	0.01	0	0.002	PVC
931	P-203	J-125	J-209	180.00	200	120.00	0.03	0	0	0	PVC
932	P-204	J-125	J-214	107.00	200	120.00	0.00	0	0	0	PVC
933	P-205	J-193	J-215	201.00	300	120.00	2.14	0.03	0.001	0.006	PVC
934	P-219	J-26	J-216	167.00	200	110.00	-2.28	0.07	0.01	0.057	Asbestos Cement
935	P-303	J-193	J-274	39.00	300	120.00	-1.83	0.03	0	0.004	PVC
936	P-305	J-274	J-194	198.00	200	120.00	0.03	0	0	0	PVC
937	P-306	J-189	J-274	249.00	300	120.00	1.86	0.03	0.001	0.005	PVC
938	P-307	J-228	J-275	314.00	300	120.00	0.52	0.01	0	0	PVC
940	P-310	J-188	J-276	110.00	300	120.00	1.38	0.02	0	0.002	PVC
941	P-311	J-276	J-182	265.00	300	120.00	-0.63	0.01	0	0.001	PVC
942	P-312	J-276	J-277	170.00	300	120.00	2.00	0.03	0.001	0.006	PVC
944	P-314	J-278	J-279 (Dummy)	172.00	300	120.00	-38.86	0.55	0.23	1.295	PVC
945	P-315	J-279 (Dummy)	J-280	255.00	300	120.00	-39.54	0.56	0.305	1.337	PVC
946	P-413	J-369	J-9	217.00	300	120.00	-3.34	0.05	0.002	0.014	PVC
947	P-463	J-119	J-413	36.00	150	120.00	0.13	0.01	0	0.002	PVC
948	P-464	J-413	J-118	118.00	200	120.00	0.13	0	0	0	PVC
949	P-466	J-414	J-263	264.00	300	120.00	2.04	0.03	0.001	0.006	PVC
950	P-467	J-8	J-415	209.00	300	120.00	-1.57	0.02	0.001	0.004	PVC
952	P-469	J-262	J-416	50.00	300	120.00	2.04	0.03	0	0.006	PVC
953	P-470	J-416	J-414	71.00	300	120.00	2.04	0.03	0	0.005	PVC
954	P-471	J-244	J-417	188.00	600	120.00	13.99	0.05	0.002	0.007	HDPE
955	P-472	J-417	J-418	70.00	600	120.00	8.86	0.03	0	0.003	PVC
956	P-483	J-216	J-426	467.00	200	110.00	-2.28	0.07	0.027	0.057	Asbestos Cement
957	P-485	J-427	J-66	310.00	200	110.00	-5.04	0.16	0.076	0.25	Asbestos Cement
961	P-494	J-238	PRV-4	3.00	350	120.00	0.00	0	0	0	PVC
962	P-495	PRV-4	J-244	3.00	350	120.00	0.00	0	0	0	PVC
963	P-496	PRV-5	J-280	37.00	400	120.00	124.01	0.99	0.336	2.735	PVC
965	P-500	J-433	J-427	244.00	200	110.00	-4.94	0.16	0.059	0.24	Asbestos Cement
966	P-501	J-40	J-433	147.00	300	110.00	-2.65	0.04	0.001	0.011	Asbestos Cement
967	P-502	J-225	J-317	106.00	300	120.00	0.68	0.01	0	0.001	PVC
968	P-529	J-461	J-542	318.00	300	120.00	9.75	0.14	0.013	0.1	PVC
971	P-536	J-202	J-183	115.00	350	120.00	2.89	0.03	0.001	0.005	PVC
972	P-597	J-232	J-455	163.00	200	120.00	-0.17	0.01	0	0.001	PVC
973	P-598	J-137	J-456	53.00	200	120.00	-0.34	0.01	0	0.001	PVC
974	P-599	J-456	J-457	147.00	200	120.00	0.86	0.03	0.001	0.008	PVC
975	P-600	J-457	J-458	105.00	200	120.00	0.01	0	0	0	PVC
976	P-601	J-458	J-459	75.00	200	120.00	0.00	0	0	0	PVC
977	P-602	J-457	J-460	112.00	200	120.00	0.41	0.01	0	0.002	PVC
978	P-603	J-457	J-462	99.00	200	120.00	0.42	0.01	0	0.002	PVC
979	P-604	J-462	J-473	83.00	200	120.00	0.41	0.01	0	0.002	PVC
982	P-607	J-263	J-261	199.00	300	120.00	1.07	0.02	0	0.002	PVC
983	P-608	J-263	J-474	104.00	300	120.00	0.96	0.01	0	0.001	PVC
984	P-609	J-155	J-475	48.00	200	120.00	0.05	0	0	0	PVC
985	P-610	J-475	J-476	99.00	200	120.00	0.05	0	0	0	PVC
986	P-611	J-476	J-477	118.00	200	120.00	0.05	0	0	0	PVC
987	P-612	J-477	J-478	106.00	200	120.00	0.01	0	0	0	PVC
988	P-613	J-478	J-479	100.00	200	120.00	-0.01	0	0	0	PVC
989	P-614	J-479	J-480	106.00	200	120.00	-0.54	0.02	0	0.003	PVC
990	P-615	J-478	Country Squire	134.00	200	120.00	0.00	0	0	0	PVC
991	P-616	Country Squire	J-482	51.00	200	120.00	0.00	0	0	0	PVC
992	P-617	J-483	J-88	77.00	200	120.00	0.00	0	0	0	PVC
993	P-618	J-255	J-484	74.00	300	120.00	-0.44	0.01	0	0	PVC
994	P-619	J-484	J-485	90.00	300	120.00	-0.47	0.01	0	0.001	PVC
995	P-620	J-485	Greenbriar	149.00	300	120.00	-0.48	0.01	0	0	PVC
996	P-621	Greenbriar	J-487	95.00	300	120.00	-0.52	0.01	0	0.001	PVC
997	P-622	J-487	J-488	146.00	300	120.00	-0.53	0.01	0	0.001	PVC
998	P-623	J-488	J-489	137.00	300	120.00	-0.53	0.01	0	0	PVC
999	P-624	J-489	J-490	161.00	300	120.00	0.87	0.01	0	0.001	PVC
1000	P-625	J-490	J-491	59.00	300	120.00	0.71	0.01	0	0.001	PVC
1001	P-626	J-472	J-492	200.00	300	120.00	1.87	0.03	0.001	0.004	PVC
1003	P-628	J-493	J-494	221.00	300	120.00	4.10	0.06	0.005	0.02	PVC
1004	P-631	J-496	J-701	290.00	300	120.00	2.19	0.03	0.001	0.006	PVC
1006	P-633	J-494	J-496	395.00	300	120.00	4.10	0.06	0.003	0.02	PVC
1007	P-634	J-256	J-499	159.00	200	120.00	0.03	0	0	0	HDPE
1008	P-635	J-125	J-500	208.00	200	120.00	0.37	0.01	0	0.002	PVC
1009	P-636	J-500	J-193	123.00	200	120.00	0.34	0.01	0	0.001	PVC
1012	P-639	J-75	J-502	104.00	200	120.00	-1.16	0.04	0.001	0.014	PVC
1013	P-640	J-502	J-503	95.00	200	120.00	-1.18	0.04	0.001	0.015	PVC
1014	P-641	J-503	J-504	118.00	200	120.00	-1.20	0.04	0.002	0.015	PVC
1015	P-642	J-504	J-505	103.00	200	120.00	-1.23	0.04	0.002	0.016	PVC
1016	P-643	J-75	J-506	84.00	200	120.00	0.06	0	0	0	PVC
1017	P-644	J-506	J-507	147.00	200	120.00	0.03	0	0	0.001	PVC
1018	P-533	J-426	J-433	198.00	200	110.00	-2.28	0.07	0.012	0.057	Asbestos Cement
1021	P-439	J-513	J-167	152.00	300	120.00	-13.33	0.19	0.022	0.178	HDPE
1023	P-441	J-148	J-338	252.00	200	120.00	0.29	0.01	0	0.001	PVC
1024	P-443	J-339	J-232	126.00	200	120.00	0.61	0.02	0.001	0.004	PVC
1025	P-445	J-340	J-341	74.00	200	120.00	0.03	0	0	0	PVC
1026	P-446	J-338	J-342	79.00	200	120.00	0.27	0.01	0	0.001	PVC
1027	P-447	J-342	J-340	138.00	200	120.00	0.11	0	0	0.001	PVC
1028	P-448	J-342	J-343	127.00	200	120.00	0.16	0.01	0	0.001	PVC
1029	P-449	J-343	J-344	109.00	200	120.00	0.03	0	0	0	PVC
1030	P-450	J-344	J-345	88.00	200	120.00	0.03	0	0	0	PVC
1031	P-451	J-345	J-346	107.00	200	120.00	-0.45	0.01	0	0.002	PVC
1032	P-452	J-255	J-347	531.00	300	120.00	0.83	0.01	0.001	0.001	HDPE
1034	P-454	J-347	J-348	255.00	200	120.00	0.33	0.01	0	0.001	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1036	P-456	J-349	J-350	241.00	250	120.00	0.21	0	0	0	PVC
1037	P-457	J-350	J-351	254.00	250	120.00	-0.31	0.01	0	0	PVC
1038	P-458	J-351	J-352	307.00	250	120.00	-0.71	0.01	0.001	0.002	PVC
1039	P-459	J-352	J-353	190.00	250	120.00	-0.71	0.01	0	0.002	PVC
1040	P-460	J-353	J-491	195.00	250	120.00	-0.71	0.01	0	0.002	PVC
1042	P-462	J-354	J-355	173.00	300	120.00	4.36	0.06	0.004	0.022	PVC
1052	P-486	J-252	J-367	354.00	300	120.00	0.09	0	0	0	PVC
1057	P-499	J-511	J-372	586.00	250	120.00	-4.54	0.09	0.01	0.059	PVC
1058	P-504	J-176	J-373	101.00	200	120.00	-0.69	0.02	0.001	0.005	PVC
1059	P-505	J-373	J-374	144.00	200	120.00	-0.69	0.02	0.001	0.006	PVC
1060	P-506	J-374	J-375	147.00	200	120.00	-0.77	0.02	0.001	0.007	PVC
1061	P-507	J-375	J-164	158.00	200	120.00	-0.77	0.02	0.001	0.007	PVC
1062	P-508	J-165	J-376	357.00	200	120.00	4.38	0.14	0.055	0.164	PVC
1063	P-510	J-377	J-378	401.00	200	120.00	0.62	0.02	0.002	0.004	PVC
1064	P-512	J-379	J-380	394.00	200	120.00	-0.40	0.01	0.001	0.002	PVC
1065	P-513	J-380	J-460	90.00	300	120.00	-0.40	0.01	0	0	PVC
1066	P-514	J-91	J-381	67.00	200	120.00	-2.27	0.07	0.003	0.048	PVC
1067	P-515	J-381	J-382	353.00	200	120.00	-2.27	0.07	0.017	0.048	PVC
1069	P-517	J-473	J-104	80.00	200	120.00	0.41	0.01	0	0.002	PVC
1073	P-524	J-384	J-385	986.00	350	120.00	-6.89	0.07	0.019	0.025	PVC
1075	P-527	J-387	J-280	912.00	350	120.00	-47.75	0.5	0.81	0.895	PVC
1077	P-530	J-389	J-669	661.00	250	120.00	-3.65	0.07	0.017	0.039	PVC
1087	P-548	J-400	Supreme Steel	629.00	300	120.00	-3.37	0.05	0.006	0.014	PVC
1103	P-573	J-424	J-425	398.00	300	120.00	-2.13	0.03	0.001	0.006	PVC
1107	P-577	J-206	J-224	304.00	322	120.00	3.65	0.04	0.004	0.012	HDPE
1108	P-580	J-173	J-429	273.00	200	120.00	0.42	0.01	0.001	0.002	PVC
1109	P-581	J-429	J-160	203.00	200	120.00	0.24	0.01	0	0.001	PVC
1110	P-582	J-153	J-430	277.00	200	120.00	-0.05	0	0	0	PVC
1111	P-583	J-430	J-480	334.00	200	120.00	-0.28	0.01	0	0.001	PVC
1112	P-584	J-480	J-431	297.00	200	120.00	-0.84	0.03	0.003	0.008	PVC
1113	P-585	J-431	J-170	268.00	200	120.00	-0.85	0.03	0.001	0.008	PVC
1116	P-588	J-435	J-436	431.00	200	120.00	0.17	0.01	0	0	PVC
1117	P-589	J-436	J-455	232.00	200	120.00	0.17	0.01	0	0	PVC
1118	P-590	J-340	J-437	148.00	200	120.00	-0.02	0	0	0	PVC
1119	P-591	J-437	J-339	102.00	200	120.00	0.65	0.02	0	0.004	PVC
1120	P-593	J-438	J-147	134.00	300	120.00	-0.75	0.01	0	0.001	PVC
1124	P-630	J-505	J-82	489.00	200	120.00	-1.27	0.04	0.008	0.017	PVC
1137	P-664	J-385	PRV-16	32.00	350	120.00	-9.96	0.1	0.011	0.049	PVC
1138	P-665	PRV-16	J-386	969.00	350	120.00	-9.96	0.1	0.042	0.049	PVC
1140	P-671	J-379	J-93	481.00	200	120.00	-0.20	0.01	0	0.001	PVC
1143	P-678	J-511	J-510	93.00	250	120.00	3.05	0.06	0.01	0.028	PVC
1149	P-684	J-509	J-444	384.00	300	120.00	-14.75	0.21	0.096	0.215	PVC
1150	P-685	J-444	J-403	378.00	300	120.00	-2.51	0.04	0.004	0.008	PVC
1153	P-688	J-401	J-623	837.00	300	120.00	2.05	0.03	0.004	0.006	PVC
1158	P-693	J-169	J-388	745.00	300	120.00	-4.53	0.06	0.012	0.024	PVC
1169	P-705	J-449	J-208	166.00	300	120.00	-3.39	0.05	0.002	0.014	PVC
1171	P-707	Supreme Steel	J-450	178.00	410	120.00	0.14	0	0	0	HDPE
1172	P-708	J-450	J-1	334.00	400	120.00	0.14	0	0	0	PVC
1174	P-710	J-343	J-452	68.00	200	120.00	0.07	0	0	0	PVC
1175	P-711	J-437	J-453	67.00	200	120.00	-0.67	0.02	0	0.006	PVC
1176	P-712	J-453	J-438	139.00	300	120.00	-0.73	0.01	0	0.001	PVC
1180	P-717	J-399	J-463	398.00	300	120.00	-2.44	0.03	0.003	0.008	PVC
1181	P-718	J-463	J-400	489.00	300	120.00	-0.84	0.01	0.001	0.001	PVC
1185	P-722	J-607	J-463	437.00	300	120.00	3.45	0.05	0.006	0.015	PVC
1186	P-723	J-418	J-495	222.00	600	120.00	8.86	0.03	0.001	0.003	PVC
1190	P-727	J-514	J-417	673.00	300	120.00	-5.13	0.07	0.012	0.031	PVC
1191	P-728	J-402	J-509	260.00	300	120.00	14.61	0.21	0.137	0.211	PVC
1192	P-729	J-509	J-412	472.00	400	120.00	26.89	0.21	0.039	0.161	PVC
1193	P-730	R-4	PRV-18	2.00	300	120.00	0.00	0	0	0	PVC
1194	P-731	PRV-18	J-454	2.00	300	120.00	0.00	0	0	0	PVC
1203	P-735	J-449	J-515	810.00	250	120.00	1.32	0.03	0.002	0.006	PVC
1206	P-737	J-425	J-516	666.00	300	120.00	-2.13	0.03	0.001	0.006	PVC
1211	P-740	J-424	J-518	0.00	300	120.00	0.00	0	0	0	PVC
1213	P-741	J-390	J-519	897.00	400	120.00	0.34	0	0	0	PVC
1216	P-743	J-373	J-520	0.00	200	120.00	0.00	0	0	0	PVC
1218	P-744	J-348	J-521	448.00	200	120.00	0.24	0.01	0	0.001	PVC
1219	P-745	J-521	J-349	448.00	200	120.00	0.24	0.01	0	0	PVC
1222	P-746	J-521	J-523	0	200	120	0	0	0	0	PVC
1224	P-747	J-349	J-524	0	250	120	0	0	0	0	PVC
1226	P-748	J-351	J-525	0	200	120	0	0	0	0	PVC
1248	P-754	J-495	J-529	560	600	120	4.58	0.02	0	0.001	PVC
1251	P-756	J-529	J-530	0	600	120	4.4	0.02	0	0.001	PVC
1253	P-757	J-530	J-531	0	600	120	4.4	0.02	0	0	PVC
1255	P-758	J-531	J-532	0	600	120	4.02	0.01	0	0.001	PVC
1256	P-759	J-532	J-390	0	600	120	4.02	0.01	0	0.001	PVC
1257	P-760	J-390	J-495	0	600	120	-4.29	0.02	0.001	0.001	PVC
1262	P-762	PRV-A	J-535	185	300	120	8.46	0.12	0.005	0.077	PVC
1263	P-763	J-535	Panattoni	185	300	120	4.1	0.06	0.004	0.02	PVC
1269	P-767	J-536	J-537	0	300	120	-1.2	0.02	0.001	0.002	PVC
1273	P-769	J-537	J-539	0	300	120	1.65	0.02	0.001	0.004	PVC
1275	P-770	J-536	J-540	0	300	120	0	0	0	0	PVC
1277	P-771	J-541	J-536	0	300	120	0.54	0.01	0	0	PVC
1280	P-773	J-542	PRV-A	0	300	120	8.46	0.12	0.008	0.077	PVC
1287	P-778	J-547	J-541	0	300	120	0.54	0.01	0	0.001	PVC
1290	P-779	J-537	J-546	0	300	120	-2.92	0.04	0.004	0.011	PVC
1294	P-782	J-536	J-547	0	300	120	-0.75	0.01	0	0.001	PVC
1295	P-783	J-547	J-542	0	350	120	-1.29	0.01	0	0.001	PVC
1304	P-789	J-1	J-550	0	350	120	4.92	0.05	0.003	0.013	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1309	P-792	J-82	J-552	0	200	120	0.19	0.01	0	0	PVC
1311	P-793	J-345	J-553	288	200	120	0.43	0.01	0	0.002	PVC
1312	P-794	J-553	J-435	288	200	120	0.43	0.01	0	0.002	PVC
1314	P-795	J-197	J-554	247	300	120	0.08	0	0	0	PVC
1315	P-796	J-554	J-200	247	300	120	0.19	0	0	0	PVC
1316	P-797	J-261	J-554	0	200	120	0.11	0	0	0	PVC
1318	P-798	J-261	J-555	401	300	120	0.46	0.01	0	0	PVC
1319	P-799	J-555	J-196	401	300	120	0.36	0.01	0	0	PVC
1324	P-801	J-555	J-558	0	200	120	0	0	0	0	PVC
1325	P-802	J-558	J-556	0	200	120	0	0	0	0	PVC
1326	P-803	J-557	J-558	0	200	120	0	0	0	0	PVC
1331	P-806	J-168	J-560	1,219	350	120	-2.91	0.03	0.003	0.005	PVC
1334	P-808	J-246	J-561	359	322	120	-38.86	0.48	0.168	0.917	HDPE
1335	P-809	J-561	J-278	359	300	120	-38.86	0.55	0.222	1.294	PVC
1337	P-810	J-277	J-562	362	300	120	3.12	0.04	0.003	0.012	PVC
1338	P-811	J-562	J-451	362	300	120	3.1	0.04	0.002	0.012	PVC
1340	P-812	J-451	J-563	0	300	120	3.03	0.04	0.003	0.011	PVC
1343	P-814	J-563	J-564	0	300	120	2.76	0.04	0.003	0.01	PVC
1344	P-815	J-564	J-167	0	300	120	2.76	0.04	0.002	0.01	PVC
1346	P-816	J-275	J-565	618	300	120	1.09	0.02	0	0.002	PVC
1347	P-817	J-565	J-180 (Dummy)	618	300	120	2.67	0.04	0.003	0.009	PVC
1349	P-818	J-275	J-566	785	300	120	-0.57	0.01	0	0	PVC
1350	P-819	J-614	J-388	785	300	120	-2.7	0.04	0.006	0.009	PVC
1352	P-820	J-566	J-567	0	300	120	0.01	0	0	0	PVC
1354	P-821	J-262	J-568	797	300	120	-1.72	0.02	0.002	0.004	PVC
1355	P-822	J-568	J-449	797	300	120	-1.86	0.03	0.002	0.005	PVC
1357	P-823	Panattoni	J-569	726	300	120	3.96	0.06	0.002	0.019	PVC
1361	P-826	J-570	J-464	726	300	120	3.96	0.06	0.004	0.019	PVC
1364	P-828	J-571	J-570	726	300	120	3.96	0.06	0.002	0.019	PVC
1368	P-830	J-573	Supreme Steel	1,001	400	120	3.51	0.03	0.001	0.003	PVC
1374	P-834	J-575	J-369	589	300	120	-3.32	0.05	0.002	0.013	PVC
1376	P-835	J-424	J-576	899	400	120	9.92	0.08	0.006	0.026	PVC
1386	P-837	J-454	J-577	0	300	120	4.33	0.06	0.002	0.022	PVC
1388	P-838	J-569	J-578	726	300	120	3.96	0.06	0.005	0.019	PVC
1389	P-839	J-578	J-571	726	300	120	3.96	0.06	0.001	0.019	PVC
1391	P-840	J-497	J-579	41	300	120	1.11	0.02	0	0.002	PVC
1392	P-841	J-579	J-498	41	300	120	0	0	0	0	PVC
1396	P-842	J-579	J-582	959	300	120	1.11	0.02	0	0.002	PVC
1402	P-845	J-403	J-585	783	300	120	-2.51	0.04	0.003	0.008	PVC
1403	P-846	J-585	J-622	783	300	120	1.17	0.02	0.001	0.002	PVC
1406	P-848	J-576	J-586	899	400	120	9.47	0.08	0.007	0.023	PVC
1411	P-851	J-280	J-588	1,451	400	120	36.51	0.29	0.138	0.284	PVC
1423	P-855	J-422	J-590	905	400	120	3.94	0.03	0.002	0.005	PVC
1426	P-857	PRV-15	J-591	974	350	120	-13	0.14	0.027	0.08	PVC
1427	P-858	J-591	J-387	974	350	120	-15.65	0.16	0.062	0.113	PVC
1430	P-860	J-592	J-577	0	300	120	-4.33	0.06	0.004	0.022	PVC
1450	P-871	J-371	J-601	444	300	120	0.2	0	0	0	PVC
1451	P-872	J-601	J-350	444	300	120	-0.53	0.01	0	0	PVC
1453	P-873	J-347	J-602	818	300	120	0.5	0.01	0	0	HDPE
1454	P-874	J-602	J-252	818	300	120	0.5	0.01	0	0	HDPE
1460	P-878	J-489	J-604	428	300	120	-1.41	0.02	0.001	0.003	PVC
1461	P-879	J-604	J-215	428	300	120	-2.14	0.03	0.001	0.006	PVC
1474	P-884	J-481	J-607	0	300	120	3.45	0.05	0.005	0.014	PVC
1476	P-885	J-508	J-608	503	300	120	8.39	0.12	0.012	0.076	PVC
1479	P-887	J-608	J-609	0	300	120	0	0	0	0	PVC
1481	P-888	J-391 (Dummy)	J-610	624	400	120	6.46	0.05	0.005	0.012	PVC
1482	P-889	J-610	J-508	624	300	120	6.46	0.09	0.01	0.047	PVC
1484	P-890	J-415	J-611	176	300	120	-1.57	0.02	0	0.003	PVC
1485	P-891	J-611	J-9	176	300	120	-1.57	0.02	0	0.004	PVC
1501	P-901	J-613	J-384	1,219	350	120	-5.89	0.06	0.007	0.019	PVC
1505	P-904	J-565	J-614	0	300	120	-1.58	0.02	0.001	0.004	PVC
1506	P-905	J-614	J-566	0	300	120	0.59	0.01	0	0.001	PVC
1528	P-914	J-619	J-671	1,187	350	120	-8.77	0.09	0.017	0.039	PVC
1530	P-915	J-584	J-620	0	300	120	3.68	0.05	0.003	0.016	PVC
1531	P-916	J-620	J-585	0	300	120	3.68	0.05	0.011	0.016	PVC
1544	P-924	J-622	J-404	754	300	120	1.17	0.02	0.001	0.002	PVC
1547	P-926	J-623	J-399	789	300	120	2.05	0.03	0.002	0.006	PVC
1549	P-927	J-610	J-439	356	300	120	-0.2	0	0	0	PVC
1553	P-929	J-412	J-626	720	400	120	24.79	0.2	0.07	0.139	PVC
1554	P-930	J-626	J-422	720	400	120	3.94	0.03	0.001	0.005	PVC
1558	P-932	J-634	J-401	1,163	300	120	6.43	0.09	0.025	0.046	PVC
1560	P-933	J-508	J-629	1,206	400	120	1.29	0.01	0	0.001	PVC
1561	P-934	J-629	J-628	1,206	400	120	1.29	0.01	0	0.001	PVC
1564	P-935	J-395	J-631	803	350	120	-1.92	0.02	0.001	0.002	PVC
1565	P-936	J-631	J-396	803	300	120	3.7	0.05	0.007	0.017	PVC
1574	P-941	J-354	J-535	0	300	120	-4.36	0.06	0.008	0.023	PVC
1580	P-944	J-439	J-624	0	300	120	-1.91	0.03	0.002	0.005	PVC
1605	P-946	J-493	J-632	0	300	120	-4.36	0.06	0.002	0.023	PVC
1606	P-947	J-632	J-355	0	300	120	-4.36	0.06	0.012	0.023	PVC
1613	P-949	J-382	PRV-24	465	200	120	-3.65	0.12	0.043	0.117	PVC
1614	P-950	PRV-24	J-377	465	200	120	-3.65	0.12	0.015	0.117	PVC
1615	P-951	J-376	J-377	0	200	120	4.27	0.14	0.053	0.156	PVC
1617	P-952	J-378	PRV-25	279	200	120	0	0	0	0	PVC
1618	P-953	PRV-25	J-379	279	200	120	0	0	0	0	PVC
1620	P-954	J-628	J-634	906	400	120	1.29	0.01	0	0	PVC
1625	P-958	J-635	J-444	1,451	300	120	15.48	0.22	0.107	0.235	PVC
1626	P-959	J-402	J-635	0	300	120	-14.61	0.21	0.066	0.211	PVC
1682	P-967	J-516	J-642	666	400	120	-2.13	0.02	0	0.002	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1683	P-968	J-642	J-393	666	400	120	-2.13	0.02	0	0.001	PVC
1712	P-971	J-382	J-644	0	200	120	0.77	0.02	0.002	0.007	PVC
1743	P-540(2)	J-647	J-393	848	400	120	-14.18	0.11	0.019	0.049	PVC
1745	P-974	J-647	J-648 (Dummy)	0	300	120	3.4	0.05	0.005	0.014	PVC
1747	P-975	J-648 (Dummy)	J-649	0	300	120	2.72	0.04	0.001	0.009	PVC
1749	P-540(1)(1)	J-392	J-650	848	400	120	-8.7	0.07	0.006	0.02	PVC
1750	P-540(1)(2)	J-650	J-647	848	400	120	-10.78	0.09	0.005	0.03	PVC
1751	P-976	J-649	J-650	0	300	120	-2.07	0.03	0.002	0.006	PVC
1794	P-691(1)	J-166	J-651	105	350	120	-13.33	0.14	0.009	0.084	PVC
1795	P-691(2)	J-651	PRV-2i	1	76	120	-13.33	2.94	0.143	143.247	PVC
1797	P-438(1)	PRV-2i	J-652	1	76	120	-13.33	2.94	0.143	143.173	PVC
1798	P-438(2)	J-652	J-513	118	350	120	-13.33	0.14	0.01	0.085	PVC
1807	P-531(1)	J-207	J-653	39	300	120	-8.51	0.12	0.003	0.078	PVC
1808	P-531(2)	J-653	PRV-Bi	1	100	120	-8.51	1.08	0.016	16.371	PVC
1810	P-532(1)	PRV-Bi	J-654	1	100	120	-8.51	1.08	0.016	16.371	PVC
1811	P-532(2)	J-654	J-210	144	300	120	-8.51	0.12	0.011	0.078	PVC
1816	P-246(1)	J-190	J-655	43	300	120	0	0	0	0	PVC
1817	P-246(2)	J-655	PRV-1i	1	76	120	0	0	0	0	PVC
1819	P-247(1)	PRV-1i	J-656	1	76	120	0	0	0	0	PVC
1820	P-247(2)	J-656	J-191	166	265	120	0	0	0	0	HDPE
1825	P-605(1)	J-456	J-657	123	200	120	-1.2	0.04	0.002	0.015	PVC
1826	P-605(2)	J-657	PRV-21i	1	76	120	-1.2	0.26	0.002	1.712	PVC
1828	P-606(1)	PRV-21i	J-658	1	76	120	-1.2	0.26	0.002	1.712	PVC
1829	P-606(2)	J-658	J-140	37	200	120	-1.2	0.04	0.001	0.014	PVC
1834	P-131(1)	J-124	J-659	15	200	120	-0.35	0.01	0	0.005	PVC
1835	P-131(2)	J-659	PRV-3i	1	50	120	-0.35	0.18	0.001	1.265	PVC
1837	P-132(1)	PRV-3i	J-660	1	50	120	-0.35	0.18	0.001	1.265	PVC
1838	P-132(2)	J-660	J-126	64	200	120	-0.35	0.01	0	0.001	PVC
1858	P-989	J-83	J-662	0	200	120	0.04	0	0	0	PVC
1860	P-990	J-85	J-663	0	200	120	0.05	0	0	0	PVC
1861	P-991	J-277	J-181	0	300	120	-1.12	0.02	0.001	0.002	PVC
1883	P-854(1)	J-589	J-666	120	250	120	-5.07	0.1	0.009	0.072	PVC
1884	P-854(2)	J-666	PRV-19i	1	76.2	120	-5.07	1.11	0.024	23.589	PVC
1886	P-680(1)	PRV-19i	J-667	1	76.2	120	-5.07	1.11	0.024	23.589	PVC
1887	P-680(2)	J-667	J-165	61	300	120	-5.07	0.07	0.002	0.029	PVC
1931	P-790(1)	J-550	J-668	0	350	120	4.66	0.05	0.003	0.012	PVC
1932	P-790(2)	J-668	J-454	0	350	120	4.41	0.05	0.002	0.011	PVC
1934	P-662(1)	J-388	J-669	44	300	120	-7.56	0.11	0.008	0.063	PVC
1935	P-662(2)	J-669	PRV-15	44	350	120	-13	0.14	0.017	0.08	PVC
1937	P-995	J-169	J-670	0	250	120	-0.03	0	0	0	PVC
1939	P-844(1)	J-387	J-671	0	350	120	17.99	0.19	0.072	0.147	PVC
1940	P-844(2)	J-671	J-584	0	350	120	7.24	0.08	0.01	0.027	PVC
1942	P-913(1)	J-386	J-672	1,187	350	120	-14.11	0.15	0.038	0.093	PVC
1945	P-955(1)	J-634	J-673	906	350	120	2.93	0.03	0.001	0.005	PVC
1948	P-996	J-674	J-672	0	350	120	9.43	0.1	0.016	0.045	PVC
1950	P-831(1)	J-481	J-675	1,001	400	120	4.67	0.04	0.001	0.006	PVC
1951	P-831(2)	J-675	J-574	1,001	400	120	4.17	0.03	0.001	0.005	PVC
1953	P-886(1)	J-608	J-676	503	400	120	8.39	0.07	0.003	0.019	PVC
1954	P-886(2)	J-676	J-481	503	400	120	8.23	0.07	0.003	0.018	PVC
1960	P-955(2)(1)	J-673	J-681	906	350	120	2.6	0.03	0.002	0.004	PVC
1961	P-955(2)(2)	J-681	J-631	906	350	120	5.99	0.06	0.007	0.019	PVC
1962	P-997	J-678	J-677	0	300	120	-3.39	0.05	0.005	0.014	PVC
1963	P-998	J-678	J-679	0	300	120	3.39	0.05	0.002	0.014	PVC
1964	P-999	J-681	J-679	0	350	120	-3.39	0.04	0.003	0.007	PVC
1966	P-490(1)	J-253	J-682	280	200	120	0.39	0.01	0	0.002	PVC
1967	P-490(2)	J-682	J-371	280	200	120	0.2	0.01	0	0.001	PVC
1973	P-1000	J-683	J-474	0	300	120	-0.96	0.01	0	0.001	PVC
1975	P-627(1)	J-492	J-685	233	300	120	1.86	0.03	0.001	0.005	PVC
1976	P-627(2)	J-685	J-493	233	300	120	0.73	0.01	0	0.001	PVC
1978	P-734(2)(1)	J-684	J-686	669	300	120	-0.43	0.01	0	0	PVC
1979	P-734(2)(2)	J-686	J-493	669	300	120	-0.99	0.01	0	0.001	PVC
1981	P-833(1)	J-508	J-687	589	300	120	-3.21	0.05	0.003	0.013	PVC
1982	P-833(2)	J-687	J-575	589	300	120	-3.32	0.05	0.003	0.014	PVC
1984	P-725(1)	J-9	J-688	642	300	120	-4.93	0.07	0.007	0.028	PVC
1985	P-725(2)	J-688	J-514	642	300	120	-5.08	0.07	0.014	0.03	PVC
1987	P-849(1)	J-586	J-689	899	400	120	9.44	0.08	0.002	0.023	PVC
1988	P-849(2)	J-689	J-391 (Dummy)	899	400	120	9.05	0.07	0.005	0.021	PVC
1990	P-428(1)	J-81	J-690	1,571	250	120	-2.68	0.05	0.006	0.022	PVC
1991	P-428(2)	J-690	J-510	1,571	250	120	-3.05	0.06	0.009	0.028	PVC
1993	P-853(1)	J-372	J-691	581	250	120	-4.54	0.09	0.014	0.059	PVC
1994	P-853(2)	J-691	J-589	581	250	120	-5.07	0.1	0.015	0.072	PVC
1996	P-286(1)	J-256	J-692	219	200	120	-0.06	0	0	0	HDPE
1997	P-286(2)	J-692	J-257	219	200	120	-0.25	0.01	0	0.001	HDPE
1999	P-76(1)	J-71	J-693	166	200	120	0.06	0	0	0	PVC
2000	P-76(2)	J-693	J-72	166	200	120	0.03	0	0	0	PVC
2003	P-988(2)	J-694	J-200	0	200	120	0.36	0.01	0	0.001	PVC
2005	P-988(1)(1)	J-515	J-695	0	200	120	1.27	0.04	0.003	0.016	PVC
2006	P-988(1)(2)	J-695	J-694	0	200	120	0.78	0.02	0.001	0.007	PVC
2010	P-956(1)	J-392	J-697	0	400	120	8.69	0.07	0.004	0.02	PVC
2011	P-956(2)	J-697	J-634	0	400	120	8.08	0.06	0.004	0.017	PVC
2013	P-832(1)	J-574	J-698	1,001	400	120	3.67	0.03	0.001	0.004	PVC
2014	P-832(2)	J-698	J-573	1,001	400	120	3.56	0.03	0	0.004	PVC
2016	P-571(1)	J-390	J-699	201	400	120	7.87	0.06	0.003	0.017	PVC
2017	P-571(2)	J-699	J-424	201	400	120	7.81	0.06	0.003	0.016	PVC
2021	P-518(1)	J-346	J-700	347	300	120	-0.45	0.01	0	0	PVC
2022	P-518(2)	J-700	J-479	347	300	120	-0.53	0.01	0	0	PVC
2026	P-948(2)	J-701	J-497	0	300	120	1.29	0.02	0	0.003	PVC
2028	P-957(1)	J-588	J-702	1,451	400	120	36.11	0.29	0.036	0.278	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
2029	P-957(2)	J-702	J-635	1,451	300	120	34.14	0.48	0.632	1.019	PVC
2031	P-1002	J-382	J-703	0	200	120	0.62	0.02	0.001	0.004	PVC
2049	P-900(1)	J-560	J-709	1,219	350	120	-3.02	0.03	0.001	0.006	PVC
2050	P-900(2)	J-709	J-613	1,219	350	120	-3.02	0.03	0.001	0.005	PVC
2056	P-1007	J-670	J-389	0	250	120	-0.96	0.02	0.002	0.003	PVC
2057	P-1008	J-624	J-391 (Dummy)	0	300	120	-1.91	0.03	0.003	0.005	PVC
2058	P-1009	J-677	J-649	0	300	120	-4.8	0.07	0.006	0.027	PVC
2060	P-1011	J-546	J-360	0	300	120	-3.76	0.05	0.007	0.017	PVC
2065	P-913(2)(1)	J-672	J-713	1,187	350	120	-6.7	0.07	0.008	0.024	PVC
2066	P-913(2)(2)	J-713	J-619	1,187	350	120	-6.7	0.07	0.01	0.024	PVC
2067	P-1014	J-404	J-715	0	300	120	-3.13	0.04	0.006	0.012	PVC
2072	P-1016(1)	J-584	J-715	0	300	120	3.56	0.05	0.009	0.015	PVC
2073	P-1016(2)	J-715	J-696	0	300	120	0.43	0.01	0	0	PVC
2094	P-1018	J-387	J-718	0	350	120	14.11	0.15	0.061	0.093	PVC
2095	P-1019	J-718	J-591	0	350	120	0.81	0.01	0	0.001	PVC
2096	P-1020	J-718	J-674	0	350	120	13.3	0.14	0.03	0.084	PVC
2109	P-1023	R-5	PRV-5	2	400	120	124.01	0.99	0.005	2.716	PVC
2129	P-1026	J-592	J-360	0	300	120	3.76	0.05	0.006	0.017	PVC
2144	P-687(2)	J-719	J-626	807	400	120	-20.85	0.17	0.033	0.101	PVC
2146	P-687(1)(1)	J-393	J-720	807	400	120	-20.85	0.17	0.024	0.101	PVC
2147	P-687(1)(2)	J-720	J-719	807	400	120	-20.85	0.17	0.021	0.101	PVC
2149	P-1029	J-111	J-721	0	200	120	0	0	0	0	PVC
2150	P-1030	J-168	J-167	0	350	120	6.28	0.07	0.009	0.021	PVC
2154	P-1032	J-555	J-723	0	300	120	0.11	0	0	0	PVC
2156	P-1033	J-723	J-724	0	300	120	0.11	0	0	0	PVC
2158	P-1034	J-724	J-725	0	300	120	0.11	0	0	0	PVC
2159	P-1035	J-725	J-192	0	300	120	0.11	0	0	0	PVC

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
185	J-160	TRUE	60	206.97	60	206.97	44.8	21.8	J-478
186	J-222	TRUE	230	350	230	350	44.5	39	J-317
187	J-162	TRUE	60	219.27	60	219.27	34.8	21.8	J-478
188	J-138	TRUE	60	96.89	60	96.89	21.8	43	J-478
189	J-192	TRUE	230	350	230	350	51.2	44.4	J-229
190	J-119	TRUE	60	144.71	60	144.71	28.8	21.8	J-111
191	J-134	TRUE	60	150.2	60.06	150.25	21.8	26.3	J-233
192	J-67	TRUE	230	350	230.01	350.01	52.5	47	J-697
193	J-38	TRUE	230	350	230.01	350.01	51.5	45.8	J-697
194	J-41	TRUE	230	350	230.03	350.03	54.2	46	J-697
195	J-144	TRUE	60	92.75	60	92.75	21.8	28.6	J-143
196	J-37	TRUE	230	350	230.01	350.01	52	45.7	J-697
197	J-472	TRUE	230	350	230	350	57.9	42.4	J-229
198	J-201	TRUE	230	350	230	350	64.6	43.2	J-317
199	J-91	TRUE	60	150.17	60	150.17	21.8	25.7	J-90
200	J-103	TRUE	60	127.83	60.07	127.9	21.8	33.3	J-102
201	J-53	TRUE	230	350	230.06	350.06	52.1	45.9	J-697
202	J-40	TRUE	230	350	230	350	56.8	46	J-697
203	J-107	TRUE	60	151.3	60	151.3	26.1	21.8	J-111
204	J-212	TRUE	230	287.23	230	287.23	21.8	25.5	J-211
205	J-197	TRUE	230	350	230	350	56.6	44.5	J-317
206	J-159	TRUE	60	200.21	60	200.21	42.8	21.8	J-478
207	J-163	TRUE	60	231.47	60	231.47	35.8	21.8	J-478
208	J-92	TRUE	60	127.16	60.05	127.21	21.8	38.7	J-372
209	J-90	TRUE	60	150.97	60.1	151.07	21.8	25.7	J-483
210	J-111	TRUE	60	111.6	60.09	111.7	21.8	21.8	J-721
211	J-177	TRUE	60	182.01	60	182.01	21.8	21.8	J-170
212	J-471	TRUE	230	350	230	350	56.2	42	J-229
213	J-233	TRUE	60	134.82	60.08	134.89	21.8	33.7	J-478
214	8 (Dun	TRUE	230	350	231.36	351.36	40.6	39.2	J-229
215	J-1	TRUE	230	350	230.36	350.36	70.8	47.6	J-697
216	J-174	TRUE	60	192.41	60.07	192.48	21.8	24.8	J-175
218	J-131	TRUE	60	174.52	60.08	174.59	24.9	21.8	J-478
219	J-100	TRUE	60	146.14	60.11	146.25	21.8	23.8	J-101
220	J-75	TRUE	60	246.39	60	246.39	38.5	21.8	J-372
221	J-60	TRUE	230	350	230	350	55.6	46.1	J-697
222	J-217	TRUE	230	350	230	350	55.1	48.1	J-697
223	J-146	TRUE	60	175.6	60	175.6	28.4	21.8	J-478
224	J-6	TRUE	230	350	230.02	350.02	23.9	44.1	J-7
225	J-169	TRUE	230	350	230	350	47.3	42.7	J-620
226	J-4	TRUE	230	350	230	350	57.8	47.1	J-697
227	J-27	TRUE	230	350	230.05	350.05	51.8	45.9	J-697
228	J-158	TRUE	60	186.15	60	186.15	33.3	21.8	J-478
229	J-14	TRUE	230	350	230	350	56.2	46.9	J-697
230	J-105	TRUE	60	146.44	60.1	146.54	21.8	37.3	J-478
231	J-261	TRUE	230	350	230	350	56	44.3	J-229
232	J-51	TRUE	230	350	230.13	350.13	56.2	45.6	J-697
233	J-183	TRUE	230	350	230	350	65.2	42.7	J-317
234	J-106	TRUE	60	152.08	60.05	152.13	27.8	21.8	J-111
235	J-244	TRUE	230	350	230	350	55.8	45.1	J-697
236	J-185	TRUE	230	350	230.23	350.23	60.8	42.8	J-317
237	J-205	TRUE	230	350	230	350	48.7	42.8	J-317
238	J-88	TRUE	60	147.65	60.09	147.74	24.9	21.8	J-483
239	J-87	TRUE	60	153.91	60	153.91	21.8	22.5	J-483
240	J-104	TRUE	60	192.49	60.09	192.59	21.8	25.4	J-473
241	J-246	TRUE	230	350	230	350	54.6	48.5	J-697
242	J-232	TRUE	60	165.39	60	165.39	25.3	21.8	J-436
243	J-30	TRUE	230	350	230.04	350.04	52.1	45.7	J-697

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
244	J-9	TRUE	230	350	230.03	350.03	53.5	44.9	J-697
245	J-182	TRUE	230	350	230.08	350.08	61.8	42.8	J-317
246	J-203	TRUE	230	350	230.14	350.14	54.2	42.8	J-317
247	J-65	TRUE	230	350	230	350	50.1	47.3	J-697
248	J-113	TRUE	60	171.11	60	171.11	24.5	21.8	J-111
249	J-126	TRUE	60	151.94	60.09	152.03	21.8	27.2	J-136
251	J-175	TRUE	60	181.63	60.04	181.67	21.8	23.5	J-170
252	J-108	TRUE	60	150.05	60.03	150.08	25.9	21.8	J-111
253	J-152	TRUE	60	163.36	60.08	163.45	26.9	21.8	J-478
254	J-200	TRUE	230	350	230	350	57.4	44.2	J-317
255	J-36	TRUE	230	350	230	350	54.2	45.6	J-697
256	J-143	TRUE	60	99	60	99	21.8	21.9	J-144
257	J-81	TRUE	60	148.41	60	148.41	41.6	21.8	J-372
258	J-12	TRUE	230	350	230	350	51.4	46.8	J-697
259	J-226	TRUE	230	350	230.04	350.04	37.9	37.9	J-317
260	J-45	TRUE	230	350	230.04	350.04	51.9	46	J-697
261	J-17	TRUE	230	350	230	350	54.4	46.3	J-697
262	J-206	TRUE	230	350	230	350	45.8	42.7	J-317
263	J-115	TRUE	60	157.88	60.03	157.91	26.6	21.8	J-111
264	J-150	TRUE	60	164.64	60	164.64	24.8	21.8	J-478
265	J-77	TRUE	60	214.78	60	214.78	45	21.8	J-372
266	J-18	TRUE	230	350	230	350	58.6	46	J-697
267	J-141	TRUE	60	105.81	60	105.81	22	21.8	J-143
268	J-8	TRUE	230	350	230.07	350.07	59.6	45.9	J-697
270	J-118	TRUE	60	137.5	60.11	137.61	21.8	27.3	J-413
271	J-34	TRUE	230	350	230	350	51.5	45.4	J-697
272	J-263	TRUE	230	350	230	350	54.7	43.7	J-229
273	J-135	TRUE	60	171.93	60.12	172.05	21.8	22	J-436
274	J-121	TRUE	60	184.91	60.03	184.93	21.8	28.4	J-122
275	J-181	TRUE	230	350	230.01	350.01	60.3	42.6	J-317
276	J-264	TRUE	230	350	231.22	351.22	51.4	44.4	J-229
277	J-220	TRUE	230	350	230.16	350.16	50.5	40.5	J-317
278	J-252	TRUE	60	188.54	60.03	188.57	21.8	22.7	J-367
279	J-142	TRUE	60	94.99	60	94.99	21.8	32.7	J-143
280	J-109	TRUE	60	147.57	60.05	147.62	29.2	21.8	J-111
281	J-129	TRUE	60	147.77	60.11	147.88	21.8	23.2	J-140
282	J-39	TRUE	230	350	230	350	51.9	45.9	J-697
283	J-164	TRUE	60	251.85	60	251.85	34.9	21.8	J-478
285	J-219	TRUE	230	350	230.05	350.05	55.3	41.3	J-317
286	J-469	TRUE	230	350	230	350	44.2	39.9	J-229
287	J-256	TRUE	60	95.97	60.06	96.02	21.8	21.8	J-499
288	J-120	TRUE	60	174.74	60	174.74	21.8	23.6	J-111
289	J-230	TRUE	230	350	230	350	33.2	31.2	J-229
290	J-130	TRUE	60	164.94	60.05	164.99	21.8	24.8	J-478
291	J-117	TRUE	60	138.67	60.07	138.74	21.8	24.4	J-118
292	J-223	TRUE	230	350	230.01	350.01	42	38.2	J-317
293	J-218	TRUE	230	350	230	350	54.8	48.3	J-697
294	J-46	TRUE	230	350	230	350	50.9	46	J-697
295	J-2	TRUE	230	350	230.22	350.22	62.3	47.1	J-697
296	J-26	TRUE	230	350	230.01	350.01	55.5	46.1	J-697
297	J-189	TRUE	60	285.73	60.08	285.8	39.9	21.8	J-372
298	J-211	TRUE	230	298.97	230	298.97	21.8	21.9	J-212
299	J-23	TRUE	230	350	230.02	350.02	52.2	46	J-697
301	J-59	TRUE	230	350	231.22	351.22	53.5	46.4	J-697
302	J-156	TRUE	60	164.28	60	164.28	24.9	21.8	J-478
303	J-199	TRUE	230	350	230.01	350.01	37.9	44.5	J-317
305	J-148	TRUE	60	168.77	60.01	168.78	26.1	21.8	J-478
306	J-132	TRUE	60	162.39	60.05	162.44	21.8	22.6	J-233

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307	J-19	TRUE	230	350	230	350	56.4	46	J-697
308	J-83	TRUE	60	185.63	60	185.63	24.1	21.8	J-372
309	J-139	TRUE	60	101.7	60.07	101.77	21.8	39.8	J-138
310	J-133	TRUE	60	151.9	60.05	151.95	24.2	21.8	J-233
311	J-96	TRUE	60	183.8	60.06	183.86	29.6	21.8	J-111
312	J-204	TRUE	230	350	230	350	53.4	42.8	J-317
313	J-52	TRUE	230	350	230	350	54.1	45.7	J-697
314	J-55	TRUE	230	350	230.06	350.06	52.8	46.4	J-697
315	J-74	TRUE	60	266.4	60	266.4	22.8	21.8	J-372
316	J-253	TRUE	60	184.05	60.01	184.06	21.8	24.7	J-682
317	J-225	TRUE	230	350	230	350	29.5	26.8	J-317
318	J-186	TRUE	230	350	230	350	65	42.8	J-317
319	J-66	TRUE	230	350	230	350	55.9	47.6	J-697
320	J-227	TRUE	230	350	231.08	351.08	33.7	34.2	J-228
321	J-54	TRUE	230	350	230.01	350.01	51.1	46.1	J-697
322	J-470	TRUE	230	350	230	350	50.1	41.1	J-229
323	J-165	TRUE	60	289.21	60	289.21	32.6	21.8	J-478
324	J-32	TRUE	230	350	230.06	350.06	54.4	45.6	J-697
325	J-42	TRUE	230	350	230.03	350.03	53.6	46	J-697
326	J-178	TRUE	230	350	230.13	350.13	52.2	42.8	J-317
327	J-93	TRUE	60	197.06	60.11	197.16	21.8	22.5	J-111
328	J-97	TRUE	60	172.76	60.06	172.82	34.9	21.8	J-111
329	J-122	TRUE	60	194.5	60.04	194.54	21.8	22.3	J-121
330	J-84	TRUE	60	181.15	60.02	181.16	21.8	23.9	J-85
331	J-62	TRUE	230	350	230	350	45.4	46.8	J-697
332	J-29	TRUE	230	350	230.01	350.01	50.9	45.8	J-697
333	J-94	TRUE	60	195.23	60	195.23	28.2	21.8	J-111
334	J-72	TRUE	60	134.74	60.06	134.8	21.8	31.6	J-693
335	J-188	TRUE	230	350	230	350	64.1	42.8	J-317
336	J-231	TRUE	60	232.58	60	232.58	21.8	31.1	J-372
337	J-229	TRUE	230	321.87	230.02	321.89	21.8	35.7	J-230
338	J-466	TRUE	230	350	230	350	39.8	38	J-229
339	J-10	TRUE	230	350	230.11	350.11	49.8	46.7	J-697
340	J-95	TRUE	60	189.53	60.02	189.55	28.4	21.8	J-111
341	5 (Dum	TRUE	230	350	231.36	351.36	51.2	46.1	J-697
342	J-78	TRUE	60	208	60	208	46.1	21.8	J-372
343	J-99	TRUE	60	154.32	60.13	154.45	30.2	21.8	J-111
345	J-7	TRUE	230	350	230	350	44.1	43.8	J-6
346	J-196	TRUE	230	350	230.1	350.1	57.4	44.6	J-317
347	J-208	TRUE	230	350	230.01	350.01	38.8	40.6	J-229
348	J-68	TRUE	60	197.75	60.08	197.82	21.8	36.8	J-372
349	J-73	TRUE	60	268.47	60.12	268.6	21.8	22.3	J-372
350	J-79	TRUE	60	183.02	60	183.02	45.3	21.8	J-372
351	J-464	TRUE	230	350	230	350	38.2	36.6	J-229
352	J-221	TRUE	230	350	230	350	46.2	39.7	J-317
353	J-63	TRUE	230	350	230.07	350.07	45.2	46.9	J-697
354	J-48	TRUE	230	350	230	350	50.8	45.9	J-697
355	J-173	TRUE	60	212.91	60.12	213.03	21.8	21.8	J-174
356	J-136	TRUE	60	157.58	60	157.58	21.8	25.7	J-126
357	J-255	TRUE	60	229.71	60.04	229.75	31.7	21.8	J-350
358	J-137	TRUE	60	189.18	60.09	189.27	21.8	27.9	J-456
359	J-44	TRUE	230	350	230	350	54.3	45.9	J-697
363	J-69	TRUE	60	208.8	60.08	208.88	21.8	28.7	J-68
364	J-461	TRUE	230	350	230.05	350.05	42.4	49.1	J-697
365	J-50	TRUE	230	350	230	350	50	45.8	J-697
366	J-58	TRUE	230	350	230.02	350.02	54.7	46.7	J-697
367	J-61	TRUE	230	350	230.02	350.02	47.3	46.7	J-697
368	6 (Dum	TRUE	230	350	231.36	351.36	51.3	46.5	J-697

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369	J-47	TRUE	230	350	230.01	350.01	52.4	46	J-697
370	J-176	TRUE	60	172.49	60.26	172.75	21.8	26.6	J-170
371	J-128	TRUE	60	125.66	60.08	125.73	22.9	21.8	J-138
372	J-151	TRUE	60	164.47	60.04	164.51	25.4	21.8	J-478
373	J-13	TRUE	230	350	230.01	350.01	56.2	46.7	J-697
374	J-33	TRUE	230	350	230.01	350.01	52.7	45.5	J-697
376	J-123	TRUE	60	194.71	60.01	194.72	21.8	25.3	J-122
378	J-21	TRUE	230	350	230.08	350.08	52.6	46	J-697
379	30 (Dum	TRUE	230	350	231.36	351.36	58	42.5	J-317
380	J-202	TRUE	230	350	230	350	63.3	43.1	J-317
381	J-168	TRUE	230	350	230	350	54.2	42.9	J-620
382	J-49	TRUE	230	350	230.07	350.07	49	45.8	J-697
383	J-110	TRUE	60	128.94	60.09	129.02	24.8	21.8	J-111
384	J-102	TRUE	60	139.16	60.05	139.22	23.4	21.8	J-103
385	J-31	TRUE	230	350	230	350	54.8	45.7	J-697
386	J-147	TRUE	60	175.97	60	175.97	30.3	21.8	J-478
387	J-28	TRUE	230	350	230	350	50.9	45.8	J-697
388	J-24	TRUE	230	350	230.01	350.01	49.9	46	J-697
389	J-465	TRUE	230	350	230	350	36.7	37.1	J-229
390	J-154	TRUE	60	155.4	60.06	155.46	24.1	21.8	J-478
391	J-89	TRUE	60	150.19	60.03	150.22	23	21.8	J-483
392	J-153	TRUE	60	158.61	60.05	158.66	26.6	21.8	J-478
394	J-98	TRUE	60	159.21	60.06	159.27	31.8	21.8	J-111
395	J-259	TRUE	230	350	230.23	350.23	52.5	47.3	J-697
396	J-3	TRUE	230	350	230.18	350.18	58.1	47.1	J-697
397	J-85	TRUE	60	174.92	60.76	175.68	21.8	25.7	J-86
398	J-71	TRUE	60	171.1	60.06	171.16	21.8	21.8	J-72
399	J-116	TRUE	60	138.57	60.07	138.63	21.8	24.4	J-103
400	J-167	TRUE	230	350	230	350	52.5	43	J-317
401	J-70	TRUE	60	231.78	60.06	231.84	21.8	21.8	J-72
402	J-43	TRUE	230	350	230	350	53.7	45.9	J-697
403	J-179	TRUE	230	350	230	350	54.5	42.7	J-317
406	J-224	TRUE	230	350	230.16	350.16	42.4	36.7	J-317
407	J-35	TRUE	230	350	230	350	56.5	45.2	J-697
408	J-145	TRUE	60	174.55	60	174.55	26.2	21.8	J-478
409	J-170	TRUE	60	162.26	60	162.26	21.8	30.3	J-177
410	J-228	TRUE	230	350	230.1	350.1	30.9	36.5	J-227
411	J-15	TRUE	230	350	230.12	350.12	54.4	46.6	J-697
412	eson Zo	TRUE	230	350	230.16	350.16	46.6	47.1	J-697
413	J-262	TRUE	230	350	230	350	56.3	42.7	J-229
414	J-76	TRUE	60	231.3	60	231.3	47	21.8	J-372
415	J-82	TRUE	60	177.99	60	177.99	37.5	21.8	J-372
416	J-187	TRUE	230	350	230.04	350.04	64.4	42.8	J-317
417	J-124	TRUE	60	197.36	60	197.36	21.8	25.2	J-123
418	J-86	TRUE	60	164.25	60.05	164.3	21.8	22.6	J-92
419	J-101	TRUE	60	141.39	60.09	141.48	21.8	24.2	J-103
420	J-140	TRUE	60	113.09	60.04	113.13	21.8	39.3	J-478
422	J-198	TRUE	230	350	230.44	350.44	44.7	44.5	J-317
423	J-248	TRUE	230	302.76	230	302.76	21.8	22.8	J-211
424	J-247	TRUE	230	324.31	230	324.31	22.1	21.8	J-248
426	J-5	TRUE	230	350	230	350	56	47.1	J-697
427	J-171	TRUE	60	217.34	60.07	217.4	21.8	24.1	J-480
428	J-22	TRUE	230	350	230.03	350.03	53.7	46	J-697
429	J-16	TRUE	230	350	230	350	54.3	46.4	J-697
430	J-184	TRUE	230	350	230.07	350.07	62.3	42.7	J-317
431	J-57	TRUE	230	350	230	350	51.4	46.6	J-697
432	J-11	TRUE	230	350	230.14	350.14	47.3	46.7	J-697
433	J-467	TRUE	230	350	230.25	350.25	41.4	38.7	J-229

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
434	J-127	TRUE	60	127.25	60.06	127.31	21.8	33.1	J-138
435	J-20	TRUE	230	350	230.01	350.01	52.2	46	J-697
436	J-172	TRUE	60	210.03	60.07	210.09	21.8	25.2	J-170
437	J-157	TRUE	60	183.81	60.03	183.84	31.9	21.8	J-478
438	J-161	TRUE	60	211.11	60	211.11	38.7	21.8	J-478
439	J-114	TRUE	60	170.37	60.01	170.38	24.3	21.8	J-111
440	J-149	TRUE	60	165.04	60.03	165.07	26.3	21.8	J-478
441	akesho	TRUE	60	171.73	60.1	171.83	26.9	21.8	J-111
442	J-257	TRUE	60	112.3	60.02	112.32	21.8	21.8	J-499
443	J-155	TRUE	60	151.09	60.05	151.14	21.9	21.8	J-478
444	0 (Dum	TRUE	60	154.99	61.36	156.36	41.3	21.8	J-372
445	J-125	TRUE	60	223.79	60.08	223.87	21.8	21.8	J-209
446	J-193	TRUE	60	282.11	60.06	282.17	27.6	21.8	J-194
447	J-194	TRUE	60	144.61	60.06	144.67	21.8	43.1	J-372
448	J-209	TRUE	60	150.72	60.07	150.78	21.8	41.7	J-372
449	J-214	TRUE	60	169.93	60	169.93	21.8	39.8	J-372
450	J-215	TRUE	60	265.84	60	265.84	23.3	21.8	J-491
451	J-216	TRUE	230	261.44	230	261.44	21.8	49.9	J-697
452	J-274	TRUE	60	281.25	60	281.25	29.3	21.8	J-194
453	J-275	TRUE	230	350	230.01	350.01	34	34.9	J-566
454	J-276	TRUE	230	350	230.02	350.02	65.3	42.8	J-317
455	J-277	TRUE	230	350	230.01	350.01	62.6	42.8	J-317
456	J-278	TRUE	230	350	230	350	56.3	50.2	J-372
457	9 (Dum	TRUE	230	350	231.36	351.36	57.4	50.2	J-372
458	J-280	TRUE	230	350	230.42	350.42	65.9	50.2	J-372
460	J-317	TRUE	230	295.61	231.36	296.97	21.8	34.9	J-225
461	reme S	TRUE	230	350	230	350	58.9	45.4	J-697
462	J-369	TRUE	230	350	230.05	350.05	47.4	44.5	J-697
463	J-413	TRUE	60	141.04	60	141.04	21.8	24.7	J-118
464	J-414	TRUE	230	350	230.01	350.01	53	43.1	J-229
465	J-415	TRUE	230	350	230	350	53.5	45.2	J-697
466	J-416	TRUE	230	350	230	350	55.1	43	J-229
467	J-417	TRUE	230	350	230	350	59.7	45	J-697
468	J-418	TRUE	230	350	230	350	59.7	45	J-697
469	J-426	TRUE	230	245.17	230	245.17	21.8	50.2	J-372
470	J-427	TRUE	230	265.49	230.19	265.69	21.8	50.1	J-697
472	J-433	TRUE	230	350	230.02	350.02	47.3	46.2	J-697
473	J-455	TRUE	60	147.4	60.02	147.41	27.4	21.8	J-436
474	J-456	TRUE	60	196.19	60	196.19	21.8	22.3	J-137
475	J-457	TRUE	60	196.43	60.03	196.46	23.3	21.8	J-459
476	J-458	TRUE	60	161.25	60.01	161.26	24.1	21.8	J-459
477	J-459	TRUE	60	142.79	60	142.79	21.8	35.6	J-458
478	J-460	TRUE	60	182.39	60.03	182.42	21.8	25	J-380
479	J-462	TRUE	60	192.33	60.01	192.34	21.8	27.3	J-459
480	J-473	TRUE	60	190.96	60	190.96	21.8	26.9	J-462
481	J-474	TRUE	230	350	230	350	41.3	42	J-683
482	J-475	TRUE	60	149.85	60	149.85	22.6	21.8	J-478
483	J-476	TRUE	60	148.04	60	148.04	23.3	21.8	J-478
484	J-477	TRUE	60	140.19	60.08	140.26	22.5	21.8	J-478
485	J-478	TRUE	60	133.62	60.03	133.66	21.8	24.4	J-482
486	J-479	TRUE	60	148.64	60	148.64	21.8	22.9	J-478
487	J-480	TRUE	60	148.51	60.03	148.54	21.8	25.3	J-479
488	ntry Sq	TRUE	60	116.78	60.01	116.79	22.6	21.8	J-482
489	J-482	TRUE	60	108.37	60	108.37	21.8	27.1	Country Squire
490	J-483	TRUE	60	132.72	60	132.72	21.8	35.3	J-88
491	J-484	TRUE	60	232.09	60.05	232.14	31	21.8	J-350
492	J-485	TRUE	60	231.91	60.02	231.93	31.6	21.8	J-491
493	reenbri	TRUE	60	231.1	60.08	231.17	32.2	21.8	J-491

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494	J-487	TRUE	60	230.06	60.03	230.08	29.4	21.8	J-491
495	J-488	TRUE	60	229.19	60	229.19	29.4	21.8	J-491
496	J-489	TRUE	60	228.03	60.02	228.05	29.3	21.8	J-491
497	J-490	TRUE	60	217.98	60.32	218.3	26.2	21.8	J-491
498	J-491	TRUE	60	209.27	60	209.27	21.8	25.1	J-353
499	J-492	TRUE	230	350	230.03	350.03	54.2	43.1	J-229
500	J-493	TRUE	230	350	230	350	51.5	44	J-229
501	J-494	TRUE	230	350	230	350	26.2	24.2	J-496
502	J-496	TRUE	230	306.17	233.83	310	21.8	23.6	J-701
503	J-497	TRUE	230	262.11	230.35	262.46	22.3	21.8	J-579
504	J-498	TRUE	230	237.04	230	237.04	21.8	23.5	J-579
505	J-499	TRUE	60	87.65	60.06	87.71	21.8	31.3	J-256
506	J-500	TRUE	60	236.18	60.05	236.23	21.8	32.8	J-372
507	Panattor	TRUE	230	350	230.28	350.28	38.8	39.3	J-569
508	J-502	TRUE	60	235.38	60.04	235.42	24.4	21.8	J-372
509	J-503	TRUE	60	218.7	60.05	218.75	21.8	23.6	J-372
510	J-504	TRUE	60	206.39	60.06	206.45	21.8	24.4	J-372
511	J-505	TRUE	60	198.47	60.08	198.55	21.8	24.6	J-372
512	J-506	TRUE	60	217.1	60.05	217.15	21.8	21.8	J-507
513	J-507	TRUE	60	159.79	60.06	159.85	21.8	37	J-372
514	J-508	TRUE	230	350	230	350	51.7	42.4	J-697
515	J-510	TRUE	60	97.46	60	97.46	34.8	21.8	J-372
516	J-511	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
518	J-338	TRUE	60	158.62	60.05	158.66	21.8	24.9	J-452
519	J-339	TRUE	60	172.54	60.08	172.62	22.7	21.8	J-346
520	J-340	TRUE	60	159.1	60.2	159.3	21.8	21.8	J-341
521	J-341	TRUE	60	135.66	60.06	135.72	21.8	31.7	J-340
522	J-342	TRUE	60	162.32	60	162.32	23.7	21.8	J-452
523	J-343	TRUE	60	147.09	60.13	147.21	23.7	21.8	J-452
524	J-344	TRUE	60	147.49	60	147.49	21.8	25	J-345
525	J-345	TRUE	60	149.77	60.09	149.86	21.8	23.7	J-346
526	J-346	TRUE	60	146.99	60	146.99	21.8	23.9	J-479
527	J-347	TRUE	60	213.26	60	213.26	29.8	21.8	J-350
528	J-348	TRUE	60	174.05	60.17	174.22	21.8	29.6	J-521
529	J-349	TRUE	60	183.86	60.06	183.92	21.8	22.7	J-524
530	J-350	TRUE	60	183.71	60	183.71	21.8	23.3	J-601
531	J-351	TRUE	60	184.57	60.79	185.36	21.8	24.2	J-525
532	J-352	TRUE	60	196.17	60	196.17	21.8	23	J-351
533	J-353	TRUE	60	194.91	60	194.91	21.8	27.2	J-352
534	J-354	TRUE	230	350	230	350	36.7	39.8	J-355
535	J-355	TRUE	60	350	60	350	33.6	40.6	J-354
540	J-360	TRUE	230	350	230	350	50.3	50.2	J-372
546	J-367	TRUE	60	177.36	60.17	177.53	21.8	27.5	J-252
549	J-371	TRUE	60	177.23	60	177.23	21.8	23.6	J-601
550	J-372	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
551	J-373	TRUE	60	169.82	60	169.82	21.8	23.6	J-520
552	J-374	TRUE	60	177.14	60.16	177.3	21.8	26.2	J-373
553	J-375	TRUE	60	197.86	60	197.86	21.8	25.1	J-374
554	J-376	TRUE	60	144.88	60.22	145.09	21.8	28.4	J-378
555	J-377	TRUE	60	109.22	60	109.22	27.9	21.8	J-378
556	J-378	TRUE	60	85.15	61.24	86.39	21.8	49.7	J-317
557	J-379	TRUE	60	196.01	61.2	197.21	21.8	25.7	J-378
558	J-380	TRUE	60	183.22	60	183.22	23.4	21.8	J-460
559	J-381	TRUE	60	151.61	60	151.61	21.8	23	J-91
560	J-382	TRUE	60	145.19	60	145.19	21.8	30.7	J-644
561	J-384	TRUE	230	350	232	352	36.5	40.4	J-620
562	J-385	TRUE	230	350	236.13	356.13	30.1	39.1	J-620
563	J-386	TRUE	230	325.89	238.29	334.18	21.8	36.6	J-620

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564	J-387	TRUE	230	350	230	350	39.3	35.5	J-620
565	J-388	TRUE	230	350	230.66	350.66	42.6	42.1	J-566
566	J-389	TRUE	230	266.73	235.37	272.1	21.8	45	J-620
567	J-390	TRUE	230	350	230.17	350.17	52.2	44.8	J-697
568	)1 (Dun	TRUE	230	350	231.36	351.36	46.4	43.2	J-697
569	J-392	TRUE	230	350	230.03	350.03	39.2	36.6	J-697
570	J-393	TRUE	230	350	239.08	359.08	49.2	41.3	J-697
572	J-395	TRUE	230	251.91	233.85	255.76	21.8	36.6	J-631
573	J-396	TRUE	230	242.66	237.4	250.06	21.8	37.4	J-395
576	J-399	TRUE	230	350	238.98	358.98	22.7	30.1	J-623
577	J-400	TRUE	230	350	235.06	355.06	40.9	44.5	J-697
578	J-401	TRUE	230	350	238.75	358.75	29.5	35.8	J-623
579	J-402	TRUE	230	350	230	350	31.1	40.2	J-635
580	J-403	TRUE	230	350	230	350	26.7	30.1	J-620
581	J-404	TRUE	230	308.85	238.6	317.45	21.8	23.3	J-622
588	J-412	TRUE	230	350	234.19	354.19	41.9	41.2	J-590
591	J-422	TRUE	230	350	230	350	40.3	33.2	J-590
593	J-424	TRUE	230	350	230.05	350.05	53.4	44	J-697
594	J-425	TRUE	230	350	230	350	46.3	42.5	J-697
596	J-429	TRUE	60	205.99	60.35	206.35	21.8	24.6	J-478
597	J-430	TRUE	60	144.89	60.45	145.34	21.8	26.4	J-480
598	J-431	TRUE	60	159.01	60.03	159.04	21.8	27.8	J-170
600	J-435	TRUE	60	131.37	60.52	131.89	21.8	28.4	J-553
601	J-436	TRUE	60	128.28	60	128.28	21.8	32.4	J-435
602	J-437	TRUE	60	172.97	60	172.97	26.5	21.8	J-479
603	J-438	TRUE	60	175.02	60.05	175.07	25.4	21.8	J-478
604	J-439	TRUE	230	350	233.42	353.42	32.6	41.9	J-624
609	J-444	TRUE	230	350	236.49	356.49	34.3	42.3	J-620
614	J-449	TRUE	230	350	230.42	350.42	38.3	40.8	J-208
615	J-450	TRUE	230	350	230	350	60.2	46.1	J-697
616	J-451	TRUE	230	350	230.16	350.16	53.3	42.8	J-317
617	J-452	TRUE	60	127.83	60.14	127.97	21.8	31.9	J-343
618	J-453	TRUE	60	174.35	60.13	174.48	31.1	21.8	J-478
619	J-454	TRUE	230	350	230.17	350.17	84.9	50.2	J-372
620	J-463	TRUE	230	350	233.71	353.71	36.3	39.2	J-399
621	J-481	TRUE	230	350	230.23	350.23	56.5	43.9	J-697
623	J-495	TRUE	230	350	230	350	59.4	44.8	J-697
624	J-514	TRUE	230	350	230.09	350.09	45.8	44.9	J-697
625	J-509	TRUE	230	350	234.94	354.94	44.5	42.6	J-590
1202	J-515	TRUE	230	285.31	230.09	285.4	21.8	33.2	J-695
1205	J-516	TRUE	230	350	230	350	48.1	41.5	J-697
1210	J-518	TRUE	230	350	230	350	33	44	J-697
1212	J-519	TRUE	230	350	230.68	350.68	46.5	44.8	J-697
1215	J-520	TRUE	60	139.93	60	139.93	21.8	32.3	J-373
1217	J-521	TRUE	60	168.42	60	168.42	21.8	23.4	J-523
1221	J-523	TRUE	60	122.86	60	122.86	21.8	44.7	J-372
1223	J-524	TRUE	60	172.86	60	172.86	21.8	27.5	J-349
1225	J-525	TRUE	60	135.46	60	135.46	21.8	42.3	J-351
1247	J-529	TRUE	230	350	230.36	350.36	56.7	44.8	J-697
1250	J-530	TRUE	230	350	230	350	52.1	44.8	J-697
1252	J-531	TRUE	230	350	230.76	350.76	52	44.8	J-697
1254	J-532	TRUE	230	350	230	350	52.1	44.8	J-697
1261	J-535	TRUE	230	350	230	350	46.6	44.6	J-578
1266	J-536	TRUE	230	350	234.96	354.96	39.4	39.1	J-541
1268	J-537	TRUE	230	350	230.16	350.16	37.7	44.8	J-539
1272	J-539	TRUE	230	316.54	233.29	319.84	21.8	44	J-537
1274	J-540	TRUE	230	350	230	350	34.1	39.1	J-541
1276	J-541	TRUE	230	350	230	350	32.1	41.3	J-536

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1279	J-542	TRUE	230	350	230	350	44.1	45	J-461
1289	J-546	TRUE	230	350	231.68	351.68	40.5	46.6	J-537
1293	J-547	TRUE	230	350	230	350	41.6	42.1	J-541
1303	J-550	TRUE	230	350	230.51	350.51	73	50.2	J-372
1308	J-552	TRUE	60	177.82	60.37	178.19	21.8	21.8	J-372
1310	J-553	TRUE	60	138.64	60	138.64	21.8	26.3	J-435
1313	J-554	TRUE	230	350	230	350	56.1	44.4	J-317
1317	J-555	TRUE	230	350	230	350	54.7	44.5	J-229
1320	J-556	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1322	J-557	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1323	J-558	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1330	J-560	TRUE	230	350	230.24	350.24	40	41.6	J-620
1333	J-561	TRUE	230	350	230	350	54.5	49.4	J-697
1336	J-562	TRUE	230	350	230.03	350.03	59.1	42.8	J-317
1339	J-563	TRUE	230	350	230.53	350.53	47.7	42.9	J-317
1342	J-564	TRUE	230	350	230	350	48	42.9	J-317
1345	J-565	TRUE	230	350	230	350	43.5	36.7	J-566
1348	J-566	TRUE	230	350	230.01	350.01	29	36	J-275
1351	J-567	TRUE	230	300	230.03	300.03	24.8	24.8	J-567
1353	J-568	TRUE	230	350	230.28	350.28	43.8	41.8	J-229
1356	J-569	TRUE	230	350	230	350	36.2	37.2	J-578
1359	J-570	TRUE	230	350	230	350	33.5	34.6	J-571
1362	J-571	TRUE	230	350	230	350	31.5	33	J-578
1366	J-573	TRUE	230	350	230.1	350.1	57.4	45	J-697
1369	J-574	TRUE	230	350	231	351	55.8	44.6	J-697
1372	J-575	TRUE	230	350	230	350	44.7	44.2	J-697
1375	J-576	TRUE	230	350	230.9	350.9	49	43.7	J-697
1385	J-577	TRUE	230	350	230	350	76.8	50.2	J-372
1387	J-578	TRUE	230	350	230	350	30.8	33.4	J-571
1390	J-579	TRUE	230	240.55	230	240.55	21.8	22.4	J-498
1395	J-582	FALSE	230	225.29	232.23	227.52	21.8	29.3	J-579
1399	J-584	TRUE	230	350	230	350	28.7	23.4	J-620
1401	J-585	TRUE	230	350	230	350	33.5	24.7	J-620
1405	J-586	TRUE	230	350	230.05	350.05	47.3	43.5	J-697
1410	J-588	TRUE	230	350	230.8	350.8	54.8	50.2	J-372
1422	J-590	TRUE	230	350	237.88	357.88	23.2	40.3	J-422
1425	J-591	TRUE	230	350	236.91	356.91	35.3	35.1	J-620
1428	J-592	TRUE	230	350	231.14	351.14	63.4	50.2	J-372
1449	J-601	TRUE	60	178.56	61.46	180.02	21.8	23.5	J-371
1452	J-602	TRUE	60	196.8	60	196.8	25.8	21.8	J-252
1459	J-604	TRUE	60	247.27	61.47	248.75	26.2	21.8	J-491
1473	J-607	TRUE	230	350	230	350	36.4	43.9	J-697
1475	J-608	TRUE	230	350	230	350	51.5	43.3	J-697
1478	J-609	TRUE	230	350	230	350	40.8	43.3	J-697
1480	J-610	TRUE	230	350	230.38	350.38	46.5	43	J-697
1483	J-611	TRUE	230	350	230	350	53.3	45	J-697
1499	J-613	TRUE	230	350	235.74	355.74	40.4	41	J-620
1504	J-614	TRUE	230	350	231.04	351.04	41.1	35.1	J-566
1526	J-619	TRUE	230	350	234.14	354.14	27.8	32.9	J-620
1529	J-620	TRUE	230	305.16	230	305.16	21.8	35.7	J-584
1542	J-622	TRUE	230	295.25	230	295.25	21.8	30.7	J-620
1545	J-623	TRUE	230	333.4	230	333.4	21.8	34	J-399
1548	J-624	TRUE	230	350	230	350	32.7	41.8	J-439
1552	J-626	TRUE	230	350	230	350	45.9	38	J-590
1556	J-628	TRUE	230	350	230	350	44.4	38.3	J-697
1559	J-629	TRUE	230	350	230	350	62.8	40.2	J-697
1563	J-631	TRUE	230	311.46	230.74	312.2	22.8	21.8	J-395
1604	J-632	TRUE	230	350	230	350	47.6	44.2	J-229

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
1619	J-634	TRUE	230	350	230	350	42.6	37.4	J-697
1623	J-635	TRUE	250	350	258.1	358.1	37	42.2	J-444
1681	J-642	TRUE	230	350	230	350	48.7	41.4	J-697
1711	J-644	TRUE	60	115.32	61.55	116.87	21.8	42.8	J-382
1741	J-647	TRUE	230	350	230	350	40.5	38.9	J-697
1744	8 (Dum	TRUE	230	350	231.36	351.36	31.4	36.6	J-649
1746	J-649	TRUE	230	350	230	350	33.9	35.3	J-677
1748	J-650	TRUE	230	350	230	350	38.5	38.2	J-697
1857	J-662	TRUE	60	147.48	60.08	147.56	21.8	31.8	J-372
1859	J-663	TRUE	60	138.86	60.1	138.96	21.8	35.4	J-372
1930	J-668	TRUE	230	350	230.5	350.5	77.3	50.2	J-372
1933	J-669	TRUE	230	350	233.6	353.6	43.4	52.3	J-713
1936	J-670	TRUE	230	291.93	231.87	293.81	21.8	34.7	J-389
1938	J-671	TRUE	230	350	233.97	353.97	33.3	30.6	J-620
1941	J-672	TRUE	230	350	234.06	354.06	35.9	35	J-713
1944	J-673	TRUE	230	350	230.67	350.67	47	37.7	J-697
1947	J-674	TRUE	230	350	237.73	357.73	36.1	34.7	J-620
1949	J-675	TRUE	230	350	231	351	55.9	44.3	J-697
1952	J-676	TRUE	230	350	230.31	350.31	54.1	43.6	J-697
1955	J-677	TRUE	230	350	232.81	352.81	26.4	36.4	J-649
1956	J-678	TRUE	230	350	230	350	31.4	31.8	J-679
1957	J-679	TRUE	230	350	230	350	28	34.3	J-677
1959	J-681	TRUE	230	350	230	350	40.5	32.3	J-395
1965	J-682	TRUE	60	174.04	60.38	174.42	21.8	28.1	J-371
1969	J-683	TRUE	230	350	231.93	351.93	29.9	41.3	J-474
1970	J-684	TRUE	230	326.9	230.85	327.76	21.8	41	J-686
1974	J-685	TRUE	230	350	232.25	352.25	52.1	43.6	J-229
1977	J-686	TRUE	230	350	231.12	351.12	34.8	43	J-684
1980	J-687	TRUE	230	350	230.22	350.22	44.7	43.6	J-697
1983	J-688	TRUE	230	350	230.3	350.3	46.3	44.8	J-697
1986	J-689	TRUE	230	350	230.8	350.8	46.9	43.4	J-697
1989	J-690	TRUE	60	117.69	60.74	118.43	41.6	21.8	J-372
1995	J-692	TRUE	60	102.2	60.38	102.58	21.8	21.8	J-499
1998	J-693	TRUE	60	147.95	60.06	148	21.8	21.8	J-72
2001	J-694	TRUE	230	246.61	230.83	247.45	21.8	37.9	J-695
2004	J-695	TRUE	230	242.82	231	243.82	21.8	37.7	J-694
2007	J-696	FALSE	230	165.79	230.86	166.65	21.8	47.5	J-620
2009	J-697	TRUE	230	350	231.23	351.23	35.4	40.5	J-650
2012	J-698	TRUE	230	350	230.22	350.22	56.9	45	J-697
2015	J-699	TRUE	230	350	230.12	350.12	51.4	44.4	J-697
2020	J-700	TRUE	60	147.05	60.17	147.22	21.8	55.7	J-669
2024	J-701	TRUE	230	282.25	231.8	284.05	21.8	22.9	J-579
2027	J-702	TRUE	230	350	233.93	353.93	53.8	55.1	J-700
2030	J-703	TRUE	60	107.61	61.23	108.84	21.8	52.8	J-700
2048	J-709	TRUE	230	350	230	350	41.6	41.2	J-560
2064	J-713	TRUE	230	300	230	300	38.9	46.7	J-672
2071	J-715	TRUE	230	296.04	230	296.04	21.8	26.5	J-696
2093	J-718	TRUE	230	350	230	350	34.8	34.9	J-620
2142	J-719	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2145	J-720	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2148	J-721	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2153	J-723	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2155	J-724	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2157	J-725	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
185	J-160	584,027.01	5,934,838.88	678.02	0	77.20	732.41
186	J-222	582,145.56	5,932,813.74	700.26	0	63.20	744.77
187	J-162	583,810.38	5,934,670.57	685.00	0	67.30	732.42
188	J-138	584,613.67	5,935,181.42	678.38	0	76.60	732.33
189	J-192	581,191.96	5,933,912.97	677.56	0	95.40	744.77
190	J-119	584,936.53	5,935,869.14	667.10	0	70.80	716.98
191	J-134	584,764.89	5,935,072.26	680.51	0.08	73.60	732.35
192	J-67	581,650.04	5,931,561.40	710.00	0.01	74.10	762.22
193	J-38	581,243.76	5,931,279.09	710.00	0.02	74.00	762.13
194	J-41	581,141.03	5,931,480.63	710.00	0.04	74.00	762.16
195	J-144	584,396.66	5,935,219.39	675.00	0	81.40	732.33
196	J-37	581,243.76	5,931,168.95	710.00	0.01	74.00	762.12
197	J-472	580,740.47	5,933,183.14	689.91	0	77.90	744.79
198	J-201	581,815.00	5,933,229.15	690.13	0	77.60	744.77
199	J-91	582,694.12	5,935,128.13	660.00	0	79.10	715.75
200	J-103	585,091.20	5,936,277.99	665.00	0.1	73.80	716.98
201	J-53	581,438.28	5,930,980.15	710.00	0.09	74.00	762.13
202	J-40	581,233.98	5,931,482.32	710.00	0.01	74.00	762.16
203	J-107	584,778.23	5,935,996.97	664.16	0	75.00	716.98
204	J-212	581,825.45	5,932,053.99	710.00	0	73.90	762.05
205	J-197	581,603.91	5,933,472.82	685.44	0	84.20	744.77
206	J-159	584,150.38	5,934,848.85	679.15	0	75.60	732.40
207	J-163	583,696.80	5,934,580.94	685.00	0	67.30	732.43
208	J-92	582,355.13	5,935,027.71	660.00	0.07	78.90	715.57
209	J-90	582,616.55	5,935,084.61	660.00	0.15	79.10	715.72
210	J-111	585,098.38	5,935,794.30	672.05	0.14	63.80	716.98
211	J-177	583,865.02	5,934,178.46	693.29	0	55.50	732.41
212	J-471	580,745.35	5,933,130.74	690.00	0	77.80	744.79
213	J-233	584,681.75	5,934,979.21	681.75	0.11	71.80	732.35
214	68 (Dum	580,952.95	5,932,747.92	698.59	2.05	65.60	744.82
215	J-1	579,511.27	5,931,168.86	705.00	0.55	82.20	762.94
216	J-174	583,865.88	5,934,330.48	690.60	0.11	59.40	732.41
218	J-131	584,433.28	5,934,995.60	679.54	0.11	75.00	732.35
219	J-100	584,835.40	5,936,162.83	665.00	0.16	73.80	716.98
220	J-75	581,067.83	5,934,963.64	655.66	0	84.80	715.36
221	J-60	581,268.02	5,931,483.28	710.00	0	74.00	762.16
222	J-217	581,836.74	5,931,627.98	710.00	0	74.20	762.29
223	J-146	584,443.42	5,934,865.47	686.39	0	65.30	732.37
224	J-6	579,945.01	5,931,013.88	708.42	0.02	76.40	762.26
225	J-169	583,532.49	5,933,358.14	700.00	0	63.50	744.73
226	J-4	579,847.42	5,931,278.15	705.69	0	80.80	762.63
227	J-27	580,669.54	5,930,951.45	710.00	0.08	74.00	762.16
228	J-158	584,415.79	5,934,856.33	685.70	0	66.30	732.38
229	J-14	580,335.90	5,931,383.96	710.00	0	74.10	762.20
230	J-105	584,480.67	5,935,747.97	663.83	0.14	75.40	716.98
231	J-261	581,205.35	5,933,531.77	685.10	0	84.70	744.77
232	J-51	581,311.65	5,930,974.43	710.00	0.2	74.00	762.10

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
233	J-183	582,114.01	5,933,238.15	690.57	0	76.90	744.76
234	J-106	584,742.82	5,936,007.34	663.04	0.08	76.60	716.98
235	J-244	581,247.28	5,930,944.87	712.82	0	69.90	762.08
236	J-185	582,109.89	5,933,372.58	689.49	0.35	78.50	744.76
237	J-205	581,855.89	5,932,883.46	697.62	0	67.00	744.79
238	J-88	582,477.45	5,934,962.82	661.52	0.14	76.80	715.65
239	J-87	582,416.94	5,934,900.96	661.92	0	76.20	715.62
240	J-104	584,294.78	5,935,708.60	663.84	0.14	75.40	716.98
241	J-246	581,897.49	5,931,628.85	710.00	0	74.30	762.33
242	J-232	584,892.94	5,934,920.80	684.28	0	68.30	732.36
243	J-30	580,902.68	5,930,954.31	710.00	0.05	74.00	762.15
244	J-9	580,323.88	5,930,706.90	710.00	0.04	73.90	762.08
245	J-182	582,375.00	5,933,263.31	692.23	0.11	74.50	744.75
246	J-203	581,820.84	5,933,082.06	694.39	0.22	71.50	744.78
247	J-65	581,778.70	5,931,509.37	710.00	0	74.10	762.24
248	J-113	584,707.09	5,935,813.70	666.13	0	72.20	716.98
249	J-126	584,863.23	5,935,234.31	677.59	0.14	77.70	732.34
251	J-175	583,860.04	5,934,212.11	692.89	0.06	56.10	732.41
252	J-108	584,859.07	5,935,946.29	665.31	0.04	73.30	716.98
253	J-152	584,376.31	5,934,716.20	687.39	0.13	63.80	732.37
254	J-200	581,603.76	5,933,231.65	690.97	0	76.40	744.77
255	J-36	581,245.19	5,931,074.55	710.09	0	73.80	762.11
256	J-143	584,418.36	5,935,234.31	675.12	0	81.20	732.33
257	J-81	581,858.80	5,934,643.74	665.00	0	71.60	715.47
258	J-12	580,220.70	5,931,351.93	710.00	0	74.10	762.23
259	J-226	582,264.78	5,932,630.99	705.95	0.06	55.10	744.78
260	J-45	580,893.42	5,931,477.97	710.00	0.06	74.00	762.16
261	J-17	580,311.95	5,931,197.47	710.00	0	74.10	762.19
262	J-206	581,857.12	5,932,625.05	705.00	0	56.50	744.81
263	J-115	584,825.79	5,935,796.19	666.72	0.05	71.30	716.98
264	J-150	584,403.44	5,934,788.09	687.49	0	63.70	732.37
265	J-77	581,167.95	5,934,784.85	659.73	0	79.00	715.38
266	J-18	580,314.80	5,931,075.86	708.85	0	75.70	762.18
267	J-141	584,418.36	5,935,257.37	675.00	0	81.40	732.33
268	J-8	580,315.10	5,931,044.42	708.00	0.11	76.90	762.18
270	J-118	585,014.92	5,935,991.35	667.08	0.16	70.80	716.98
271	J-34	581,184.46	5,930,958.60	713.60	0	68.80	762.11
272	J-263	580,990.65	5,933,540.47	686.38	0	82.90	744.78
273	J-135	584,890.35	5,935,064.77	680.00	0.19	74.30	732.35
274	J-121	584,820.49	5,935,506.24	675.00	0.04	59.60	716.99
275	J-181	582,540.59	5,933,275.94	693.31	0.02	73.00	744.75
276	J-264	581,189.28	5,933,693.30	681.63	1.83	89.60	744.77
277	J-220	582,117.40	5,932,983.49	695.93	0.24	69.30	744.77
278	J-252	578,937.82	5,934,828.30	660.00	0.04	78.50	715.29
279	J-142	584,423.78	5,935,296.70	675.00	0	81.40	732.33
280	J-109	584,921.74	5,935,884.21	666.76	0.08	71.30	716.98
281	J-129	584,501.09	5,935,261.44	676.15	0.16	79.70	732.33

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
282	J-39	581,239.51	5,931,322.53	710.00	0	74.00	762.14
283	J-164	583,606.03	5,934,540.88	685.74	0	66.30	732.44
285	J-219	582,113.42	5,933,083.07	693.64	0.08	72.60	744.77
286	J-469	580,912.58	5,932,829.94	695.69	0	69.70	744.81
287	J-256	580,441.19	5,935,464.19	655.00	0.08	85.60	715.30
288	J-120	584,734.38	5,935,692.75	670.15	0	66.50	716.99
289	J-230	581,106.83	5,932,460.94	706.93	0	53.80	744.84
290	J-130	584,431.22	5,935,093.29	677.58	0.08	77.70	732.34
291	J-117	585,014.92	5,936,121.64	665.00	0.11	73.80	716.98
292	J-223	582,152.61	5,932,731.90	702.98	0.01	59.30	744.78
293	J-218	581,867.74	5,931,628.35	710.00	0	74.30	762.31
294	J-46	580,798.60	5,931,476.05	710.00	0	74.00	762.17
295	J-2	579,680.28	5,931,170.16	705.50	0.33	81.30	762.80
296	J-26	580,564.63	5,931,456.51	710.00	0.02	74.10	762.17
297	J-189	581,084.12	5,934,453.39	665.00	0.11	71.50	715.34
298	J-211	581,876.01	5,932,068.33	710.09	0	73.70	762.05
299	J-23	580,668.11	5,931,070.17	710.00	0.03	74.10	762.17
301	J-59	581,386.82	5,931,485.18	710.00	1.83	74.10	762.17
302	J-156	584,404.53	5,934,722.07	688.13	0	62.80	732.37
303	J-199	581,769.17	5,933,510.82	685.00	0.02	84.80	744.77
305	J-148	584,454.98	5,934,760.96	689.42	0.02	61.00	732.37
306	J-132	584,558.06	5,935,001.03	680.87	0.07	73.10	732.35
307	J-19	580,403.49	5,931,080.18	707.98	0	76.90	762.18
308	J-83	581,967.59	5,934,879.14	661.00	0	77.40	715.50
309	J-139	584,644.86	5,935,312.98	676.87	0.1	78.70	732.33
310	J-133	584,653.03	5,935,049.18	680.00	0.07	74.30	732.35
311	J-96	584,368.02	5,935,856.50	660.02	0.09	80.90	716.98
312	J-204	581,850.05	5,933,080.11	694.67	0	71.10	744.78
313	J-52	581,362.87	5,930,976.72	710.00	0	74.00	762.11
314	J-55	581,524.10	5,931,157.51	710.00	0.1	74.10	762.17
315	J-74	580,931.94	5,934,929.32	656.10	0	84.10	715.34
316	J-253	578,957.63	5,934,474.88	660.00	0.02	78.50	715.29
317	J-225	582,168.53	5,932,538.56	707.11	0	53.50	744.78
318	J-186	582,113.31	5,933,524.29	685.00	0	84.80	744.75
319	J-66	581,776.04	5,931,621.09	710.00	0	74.20	762.25
320	J-227	582,440.48	5,932,638.63	706.71	1.63	54.00	744.78
321	J-54	581,528.40	5,930,990.16	710.00	0.01	74.00	762.14
322	J-470	580,815.61	5,933,005.16	692.36	0	74.40	744.80
323	J-165	583,521.11	5,934,524.87	687.40	0	63.90	732.45
324	J-32	581,064.31	5,930,954.31	710.00	0.08	74.00	762.13
325	J-42	581,092.22	5,931,480.07	710.00	0.05	74.00	762.16
326	J-178	583,196.31	5,933,356.52	696.11	0.19	69.00	744.72
327	J-93	584,191.17	5,935,768.07	660.00	0.16	80.90	716.98
328	J-97	584,487.83	5,935,930.76	660.00	0.09	80.90	716.98
329	J-122	584,821.83	5,935,460.16	675.00	0.06	59.60	716.99
330	J-84	582,052.57	5,934,877.70	660.32	0.02	78.30	715.51
331	J-62	581,787.29	5,931,163.23	710.00	0	74.10	762.20

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
332	J-29	580,819.72	5,930,954.31	710.00	0.01	74.00	762.15
333	J-94	584,255.00	5,935,803.19	660.00	0	80.90	716.98
334	J-72	580,939.25	5,935,281.52	655.00	0.09	85.60	715.33
335	J-188	582,266.79	5,933,527.86	686.55	0	82.60	744.75
336	J-231	580,791.64	5,934,829.71	658.98	0	80.00	715.33
337	J-229	581,106.36	5,932,407.45	708.32	0.03	51.80	744.84
338	J-466	580,911.13	5,932,595.87	700.92	0	62.30	744.83
339	J-10	579,940.63	5,931,347.65	705.00	0.17	81.30	762.29
340	J-95	584,308.01	5,935,828.08	660.00	0.03	80.90	716.98
341	5 (Dumr	580,618.70	5,931,343.45	710.00	2.05	74.10	762.17
342	J-78	581,169.38	5,934,827.76	658.78	0	80.30	715.38
343	J-99	584,705.73	5,936,073.73	662.40	0.2	77.50	716.98
345	J-7	579,949.27	5,931,039.18	708.18	0	76.80	762.26
346	J-196	581,597.38	5,933,587.35	683.44	0.15	87.10	744.77
347	J-208	581,439.10	5,932,459.61	706.90	0.02	53.80	744.84
348	J-68	580,592.95	5,934,845.60	659.96	0.12	78.60	715.31
349	J-73	580,877.59	5,934,935.04	656.37	0.19	83.70	715.34
350	J-79	581,379.39	5,934,807.01	659.35	0	79.60	715.41
351	J-464	580,909.59	5,932,458.81	705.00	0	56.60	744.84
352	J-221	582,125.37	5,932,889.89	698.69	0	65.40	744.77
353	J-63	581,781.57	5,931,261.93	710.00	0.11	74.10	762.21
354	J-48	580,984.87	5,931,374.92	710.00	0	74.00	762.16
355	J-173	583,884.96	5,934,430.17	688.11	0.19	62.90	732.41
356	J-136	584,891.71	5,935,152.93	679.69	0	74.70	732.35
357	J-255	580,263.72	5,934,844.03	655.00	0.06	85.60	715.30
358	J-137	584,631.30	5,935,458.11	675.00	0.13	59.60	716.99
359	J-44	580,980.30	5,931,477.21	710.00	0	74.00	762.16
363	J-69	580,683.06	5,934,980.81	657.45	0.12	82.10	715.32
364	J-461	580,324.91	5,931,786.10	709.66	0.08	74.60	762.21
365	J-50	580,982.78	5,931,104.50	710.00	0	74.00	762.15
366	J-58	581,515.23	5,931,487.78	710.00	0.03	74.10	762.18
367	J-61	581,675.72	5,931,158.94	710.00	0.02	74.10	762.19
368	6 (Dumr	581,521.24	5,931,231.89	710.00	2.05	74.10	762.17
369	J-47	580,657.25	5,931,474.23	710.00	0.01	74.10	762.17
370	J-176	583,816.43	5,934,177.51	694.01	0.39	54.50	732.41
371	J-128	584,625.87	5,935,253.30	677.60	0.11	77.70	732.33
372	J-151	584,368.17	5,934,786.73	686.46	0.05	65.20	732.37
373	J-13	580,314.34	5,931,355.17	710.00	0.01	74.10	762.21
374	J-33	581,129.33	5,930,960.12	711.70	0.01	71.60	762.12
376	J-123	584,823.26	5,935,405.93	675.00	0.01	59.60	717.00
378	J-21	580,469.94	5,931,023.06	709.21	0.11	75.20	762.18
379	30 (Dum	582,732.45	5,933,277.32	694.69	2.05	71.10	744.75
380	J-202	581,938.04	5,933,230.80	691.08	0	76.20	744.77
381	J-168	583,530.88	5,933,486.18	696.64	0	68.20	744.71
382	J-49	580,979.92	5,931,250.39	710.00	0.11	74.00	762.15
383	J-110	584,991.94	5,935,799.82	669.94	0.13	66.80	716.98
384	J-102	585,009.28	5,936,277.18	663.86	0.08	75.40	716.98

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
385	J-31	580,988.50	5,930,955.74	710.00	0	74.00	762.14
386	J-147	584,453.45	5,934,840.49	687.96	0	63.00	732.37
387	J-28	580,746.77	5,930,951.45	710.00	0	74.00	762.16
388	J-24	580,662.38	5,931,227.51	710.00	0.01	74.10	762.17
389	J-465	580,908.44	5,932,502.26	705.00	0	56.50	744.84
390	J-154	584,411.58	5,934,645.67	688.86	0.1	61.80	732.37
391	J-89	582,495.94	5,935,018.15	660.81	0.05	77.90	715.67
392	J-153	584,372.24	5,934,648.39	687.96	0.08	63.00	732.37
394	J-98	584,633.48	5,936,025.02	660.29	0.09	80.50	716.98
395	J-259	580,335.37	5,931,450.69	710.00	0.35	74.10	762.20
396	J-3	579,802.82	5,931,225.65	706.10	0.27	80.30	762.68
397	J-85	582,115.29	5,934,881.39	660.25	1.14	78.50	715.53
398	J-71	580,907.63	5,935,126.70	655.00	0.08	85.60	715.33
399	J-116	585,011.03	5,936,214.00	665.00	0.1	73.80	716.98
400	J-167	583,523.26	5,933,883.17	694.49	0	71.20	744.64
401	J-70	580,800.35	5,935,056.62	655.00	0.08	85.60	715.33
402	J-43	581,021.33	5,931,478.00	710.00	0	74.00	762.16
403	J-179	582,955.94	5,933,296.73	695.00	0	70.60	744.73
406	J-224	582,174.13	5,932,629.80	705.00	0.24	56.50	744.78
407	J-35	581,249.48	5,930,968.71	712.31	0	70.70	762.09
408	J-145	584,444.72	5,934,995.00	679.73	0	74.70	732.35
409	J-170	583,875.75	5,934,103.79	694.22	0	54.20	732.40
410	J-228	582,556.63	5,932,642.20	708.46	0.16	51.60	744.78
411	J-15	580,429.24	5,931,386.27	710.00	0.18	74.10	762.19
412	eson Zo	581,783.00	5,931,386.36	710.00	0.23	74.10	762.22
413	J-262	580,997.23	5,933,183.46	691.01	0	76.30	744.79
414	J-76	581,080.70	5,934,784.85	659.39	0	79.50	715.37
415	J-82	581,851.29	5,934,868.21	661.29	0	76.90	715.47
416	J-187	582,195.09	5,933,525.99	685.61	0.06	84.00	744.75
417	J-124	584,883.57	5,935,380.79	675.00	0	59.60	717.00
418	J-86	582,250.40	5,934,884.38	660.62	0.07	78.00	715.57
419	J-101	584,926.98	5,936,225.99	665.00	0.13	73.80	716.98
420	J-140	584,498.38	5,935,323.83	675.17	0.06	81.10	732.31
422	J-198	581,719.60	5,933,471.45	685.00	0.66	84.80	744.77
423	J-248	581,903.32	5,932,070.50	710.80	0	72.80	762.06
424	J-247	581,891.92	5,931,996.23	710.54	0	73.20	762.11
426	J-5	579,945.61	5,931,212.07	706.57	0	79.40	762.53
427	J-171	583,770.32	5,934,494.96	687.57	0.1	63.70	732.42
428	J-22	580,670.19	5,931,024.49	710.00	0.05	74.10	762.17
429	J-16	580,476.44	5,931,406.30	710.00	0	74.10	762.19
430	J-184	582,112.89	5,933,307.91	690.00	0.1	77.70	744.76
431	J-57	581,518.38	5,931,364.91	710.00	0.01	74.10	762.18
432	J-11	580,115.27	5,931,356.66	710.00	0.21	74.20	762.25
433	J-467	580,945.04	5,932,670.20	698.68	0.37	65.50	744.82
434	J-127	584,738.45	5,935,230.24	678.28	0.09	76.70	732.34
435	J-20	580,457.07	5,931,080.27	710.00	0.01	74.10	762.18
436	J-172	583,827.64	5,934,460.07	688.49	0.1	62.30	732.42

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437	J-157	584,429.91	5,934,843.88	686.75	0.05	64.80	732.38
438	J-161	583,932.31	5,934,795.27	682.13	0	71.40	732.41
439	J-114	584,722.31	5,935,766.42	668.89	0.01	68.30	716.98
440	J-149	584,407.51	5,934,758.25	688.05	0.05	62.90	732.37
441	akeshor	584,613.31	5,935,863.83	662.35	0.15	77.50	716.98
442	J-257	580,273.72	5,935,345.33	655.00	0.03	85.60	715.30
443	J-155	584,414.29	5,934,584.64	689.82	0.07	60.40	732.37
444	0 (Dumr	581,734.36	5,934,653.26	664.25	2.05	72.70	715.45
445	J-125	580,796.41	5,934,677.05	660.00	0.12	78.50	715.33
446	J-193	580,848.07	5,934,368.52	665.00	0.09	71.40	715.33
447	J-194	580,976.24	5,934,190.14	670.34	0.09	63.90	715.33
448	J-209	580,970.10	5,934,678.48	660.00	0.1	78.50	715.33
449	J-214	580,690.97	5,934,694.14	660.00	0	78.50	715.33
450	J-215	580,690.08	5,934,275.57	666.57	0	69.20	715.32
451	J-216	580,551.33	5,931,612.96	710.00	0	74.10	762.17
452	J-274	580,878.67	5,934,350.62	665.00	0	71.40	715.33
453	J-275	582,747.60	5,932,645.50	707.89	0.02	52.40	744.78
454	J-276	582,369.34	5,933,528.13	687.83	0.03	80.80	744.75
455	J-277	582,535.87	5,933,574.49	689.17	0.02	78.90	744.74
456	J-278	582,252.25	5,931,642.45	710.00	0	75.30	763.03
457	79 (Dum	582,429.55	5,931,644.90	712.34	2.05	72.50	763.44
458	J-280	582,657.75	5,931,650.26	715.00	0.63	69.60	764.01
460	J-317	582,199.34	5,932,409.79	709.00	2.04	50.80	744.78
461	preme S	579,529.45	5,930,618.12	710.00	0	74.50	762.46
462	J-369	580,329.98	5,930,530.83	711.57	0.07	71.70	762.05
463	J-413	584,962.80	5,935,893.67	667.76	0	69.90	716.98
464	J-414	580,992.55	5,933,333.24	690.00	0.01	77.80	744.79
465	J-415	580,322.26	5,930,836.93	709.65	0	74.50	762.12
466	J-416	580,996.56	5,933,257.52	690.00	0	77.80	744.79
467	J-417	581,409.37	5,930,749.49	710.00	0	73.90	762.07
468	J-418	581,473.62	5,930,748.31	710.00	0	73.90	762.07
469	J-426	581,027.60	5,931,617.03	710.00	0	74.10	762.17
470	J-427	581,474.51	5,931,632.42	711.07	0.29	72.60	762.20
472	J-433	581,230.40	5,931,623.34	710.40	0.04	73.50	762.17
473	J-455	585,032.66	5,934,913.17	682.73	0.02	70.40	732.36
474	J-456	584,578.32	5,935,458.14	674.14	0	60.80	717.00
475	J-457	584,473.57	5,935,561.72	668.91	0.05	68.20	716.99
476	J-458	584,552.88	5,935,630.17	668.40	0.02	69.00	716.99
477	J-459	584,630.33	5,935,622.09	670.00	0	66.70	716.99
478	J-460	584,399.04	5,935,479.51	669.91	0.04	66.80	716.98
479	J-462	584,407.26	5,935,625.71	666.69	0.02	71.40	716.99
480	J-473	584,318.20	5,935,632.34	665.00	0	73.80	716.98
481	J-474	580,907.43	5,933,564.98	687.95	0	80.70	744.78
482	J-475	584,394.68	5,934,582.93	689.24	0	61.20	732.37
483	J-476	584,378.97	5,934,558.28	688.81	0	61.80	732.37
484	J-477	584,385.26	5,934,422.76	691.17	0.11	58.50	732.37
485	J-478	584,452.79	5,934,337.14	695.00	0.05	53.00	732.37

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486	J-479	584,456.37	5,934,203.11	695.00	0	53.00	732.37
487	J-480	584,346.35	5,934,199.50	695.00	0.05	53.00	732.37
488	untry Sq	584,451.06	5,934,432.27	692.57	0.01	56.50	732.37
489	J-482	584,501.53	5,934,435.28	693.17	0	55.60	732.37
490	J-483	582,554.17	5,934,938.61	663.74	0	73.70	715.65
491	J-484	580,257.71	5,934,709.77	655.00	0.08	85.60	715.30
492	J-485	580,164.03	5,934,700.83	655.00	0.03	85.60	715.30
493	Greenbria	580,160.09	5,934,602.78	655.28	0.11	85.20	715.30
494	J-487	580,157.19	5,934,461.58	658.62	0.04	80.50	715.30
495	J-488	580,264.39	5,934,426.70	660.00	0	78.50	715.30
496	J-489	580,262.15	5,934,273.16	662.79	0.02	74.50	715.30
497	J-490	580,263.09	5,934,169.52	664.93	0.47	71.50	715.30
498	J-491	580,263.09	5,934,052.82	668.12	0	67.00	715.30
499	J-492	580,603.96	5,933,233.91	687.77	0.05	80.90	744.79
500	J-493	580,285.22	5,933,229.98	685.12	0	84.70	744.78
501	J-494	580,019.98	5,933,222.44	681.92	0	89.20	744.74
502	J-496	579,846.07	5,933,216.09	683.33	5.74	87.10	744.71
503	J-497	579,558.48	5,933,207.86	680.78	0.53	90.70	744.70
504	J-498	579,384.04	5,933,248.61	680.76	0	90.80	744.70
505	J-499	580,585.32	5,935,532.59	655.00	0.09	85.60	715.30
506	J-500	580,800.29	5,934,469.04	664.91	0.08	71.60	715.33
507	Panatton	580,493.51	5,932,097.85	705.00	0.42	56.70	744.95
508	J-502	581,171.70	5,934,953.60	655.96	0.06	84.30	715.38
509	J-503	581,266.41	5,934,961.33	656.39	0.08	83.70	715.39
510	J-504	581,381.72	5,934,985.17	655.83	0.08	84.60	715.40
511	J-505	581,484.80	5,934,976.15	656.63	0.13	83.40	715.41
512	J-506	581,091.17	5,935,043.79	655.00	0.08	85.70	715.36
513	J-507	581,089.89	5,935,190.68	655.00	0.1	85.70	715.36
514	J-508	580,357.88	5,929,962.29	715.00	0	66.60	761.95
515	J-510	582,422.00	5,934,645.84	669.74	0	65.10	715.59
516	J-511	582,750.31	5,934,542.81	677.72	4.47	53.90	715.66
518	J-338	584,547.50	5,934,594.73	690.00	0.07	60.10	732.37
519	J-339	584,844.68	5,934,804.41	685.00	0.12	67.20	732.36
520	J-340	584,755.52	5,934,642.61	690.00	0.3	60.10	732.37
521	J-341	584,801.75	5,934,584.83	690.00	0.08	60.10	732.37
522	J-342	584,626.74	5,934,593.08	689.17	0	61.30	732.37
523	J-343	584,630.05	5,934,465.96	690.99	0.19	58.70	732.37
524	J-344	584,677.93	5,934,368.55	692.43	0	56.70	732.37
525	J-345	584,719.20	5,934,290.95	693.49	0.13	55.20	732.37
526	J-346	584,743.41	5,934,208.42	694.61	0	53.60	732.37
527	J-347	579,821.81	5,934,839.28	655.41	0	85.00	715.30
528	J-348	579,906.54	5,934,628.04	660.00	0.26	78.50	715.29
529	J-349	579,552.52	5,934,390.76	660.66	0.1	77.50	715.29
530	J-350	579,560.18	5,934,186.05	665.00	0	71.40	715.29
531	J-351	579,798.46	5,934,185.19	665.00	1.19	71.40	715.29
532	J-352	580,053.20	5,934,194.89	663.47	0	73.60	715.30
533	J-353	580,058.17	5,934,050.10	666.33	0	69.50	715.30

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
534	J-354	580,312.61	5,932,449.20	700.00	0	63.80	744.91
535	J-355	580,307.45	5,932,622.04	699.36	0	64.60	744.88
540	J-360	578,697.01	5,931,540.09	705.00	0	83.70	763.98
546	J-367	578,717.06	5,934,829.40	659.32	0.26	79.50	715.29
549	J-371	579,058.45	5,934,237.94	663.97	0	72.80	715.29
550	J-372	582,913.82	5,934,492.65	678.92	0	52.30	715.74
551	J-373	583,715.84	5,934,179.49	692.83	0	56.20	732.41
552	J-374	583,711.11	5,934,323.53	691.08	0.24	58.70	732.42
553	J-375	583,617.79	5,934,384.39	690.00	0	60.20	732.43
554	J-376	583,516.06	5,934,862.86	676.07	0.32	79.40	732.03
555	J-377	583,509.18	5,935,200.72	667.03	0	91.70	731.64
556	J-378	583,929.49	5,935,204.80	671.35	1.85	85.60	731.62
557	J-379	583,908.95	5,935,493.03	665.29	1.8	73.40	716.98
558	J-380	584,314.82	5,935,494.87	667.94	0	69.60	716.98
559	J-381	582,697.16	5,935,191.31	659.04	0	80.50	715.78
560	J-382	583,041.84	5,935,201.63	664.23	0	73.30	715.90
561	J-384	584,690.83	5,933,525.77	696.39	3	68.70	744.79
562	J-385	584,716.16	5,932,759.41	700.00	9.2	63.80	744.93
563	J-386	584,750.39	5,931,678.72	704.69	12.44	78.10	759.71
564	J-387	583,563.61	5,931,658.08	713.93	0	66.20	760.59
565	J-388	583,543.54	5,932,874.51	705.00	1	56.50	744.82
566	J-389	583,975.37	5,932,756.68	705.00	8.06	56.40	744.75
567	J-390	581,655.30	5,929,996.66	715.00	0.26	66.80	762.05
568	91 (Dum	580,970.38	5,929,997.16	715.00	2.05	66.60	761.94
569	J-392	580,813.36	5,929,007.00	720.00	0.04	59.10	761.65
570	J-393	581,663.98	5,929,028.48	715.00	13.62	66.20	761.62
572	J-395	580,870.63	5,928,007.60	715.77	5.77	65.00	761.54
573	J-396	579,994.03	5,927,974.61	710.79	11.1	72.00	761.50
576	J-399	579,124.50	5,929,557.08	715.00	13.47	66.40	761.79
577	J-400	579,105.90	5,930,558.91	710.00	7.59	74.10	762.19
578	J-401	579,838.42	5,929,089.06	711.05	13.13	71.80	761.67
579	J-402	582,479.98	5,930,426.58	717.66	0	62.50	761.71
580	J-403	583,291.35	5,930,024.89	715.00	0	65.30	761.01
581	J-404	584,008.12	5,930,317.94	710.00	12.89	71.70	760.54
588	J-412	582,422.40	5,929,556.63	716.72	6.29	63.60	761.53
591	J-422	582,450.12	5,928,880.13	715.00	0	66.10	761.53
593	J-424	581,660.97	5,929,623.62	713.50	0.08	68.80	761.95
594	J-425	581,665.24	5,929,366.79	715.00	0	66.40	761.77
596	J-429	584,050.71	5,934,639.34	683.04	0.53	70.10	732.41
597	J-430	584,216.79	5,934,482.79	688.98	0.68	61.60	732.37
598	J-431	584,057.80	5,934,105.74	690.03	0.04	60.10	732.39
600	J-435	584,997.94	5,934,344.14	690.00	0.78	60.10	732.36
601	J-436	585,098.32	5,934,735.10	689.76	0	60.50	732.36
602	J-437	584,749.37	5,934,767.29	686.86	0	64.60	732.37
603	J-438	584,571.05	5,934,804.08	690.00	0.08	60.10	732.37
604	J-439	580,563.59	5,929,433.52	710.00	5.13	73.70	761.94
609	J-444	582,796.35	5,930,027.09	720.00	9.73	58.80	761.46

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
614	J-449	581,421.38	5,932,595.83	704.53	0.64	57.20	744.82
615	J-450	579,529.68	5,930,833.39	710.00	0	74.70	762.63
616	J-451	582,718.01	5,933,794.15	686.82	0.24	82.20	744.71
617	J-452	584,568.62	5,934,437.45	692.38	0.21	56.80	732.37
618	J-453	584,709.29	5,934,821.05	685.00	0.19	67.20	732.37
619	J-454	578,967.63	5,931,180.10	705.00	0.26	85.20	764.99
620	J-463	579,109.34	5,929,955.19	715.00	5.56	66.70	762.00
621	J-481	579,912.34	5,929,983.06	710.05	0.34	73.90	762.10
623	J-495	581,742.29	5,930,634.26	710.00	0	73.90	762.05
624	J-514	581,024.45	5,930,758.71	710.00	0.13	73.90	762.07
625	J-509	582,414.25	5,929,796.24	715.00	7.41	66.00	761.53
1202	J-515	581,712.08	5,932,708.51	700.00	0.13	63.60	744.81
1205	J-516	581,669.94	5,929,192.84	715.00	0	66.20	761.65
1210	J-518	581,830.29	5,929,625.08	715.00	0	66.60	761.95
1212	J-519	581,835.07	5,929,999.06	715.66	1.03	65.80	762.05
1215	J-520	583,628.60	5,934,178.46	691.55	0	58.00	732.41
1217	J-521	579,709.90	5,934,475.78	661.19	0	76.80	715.29
1221	J-523	579,612.49	5,934,670.51	660.00	0	78.50	715.29
1223	J-524	579,458.36	5,934,392.85	660.00	0	78.50	715.29
1225	J-525	579,864.05	5,934,327.41	663.27	0	73.80	715.29
1247	J-529	581,722.82	5,930,546.21	711.81	0.54	71.30	762.05
1250	J-530	581,718.67	5,930,439.72	715.00	0	66.80	762.05
1252	J-531	581,695.54	5,930,265.84	715.00	1.14	66.80	762.05
1254	J-532	581,651.35	5,930,158.96	715.00	0	66.80	762.05
1261	J-535	580,317.76	5,932,082.48	705.00	0	56.70	744.97
1266	J-536	579,735.35	5,931,890.66	705.76	7.45	80.50	762.45
1268	J-537	579,384.24	5,931,741.18	705.00	0.23	82.20	762.88
1272	J-539	579,340.40	5,932,056.77	700.00	4.94	89.20	762.87
1274	J-540	579,699.30	5,932,009.28	700.12	0	88.50	762.45
1276	J-541	579,799.44	5,931,732.09	706.82	0	78.90	762.42
1279	J-542	580,321.43	5,931,912.84	706.22	0	79.50	762.21
1289	J-546	579,073.46	5,931,613.43	705.00	2.52	82.80	763.36
1293	J-547	580,088.01	5,932,060.24	705.55	0	80.60	762.34
1303	J-550	579,304.34	5,931,106.29	705.49	0.76	82.60	763.71
1308	J-552	581,774.56	5,934,875.22	660.36	0.56	78.20	715.47
1310	J-553	584,830.76	5,934,337.70	691.53	0	58.00	732.36
1313	J-554	581,603.99	5,933,308.60	689.95	0	77.80	744.77
1317	J-555	581,321.58	5,933,537.76	685.33	0	84.40	744.77
1320	J-556	581,323.99	5,933,415.23	687.59	0	81.20	744.77
1322	J-557	581,250.04	5,933,467.96	686.55	0	82.60	744.77
1323	J-558	581,327.56	5,933,467.96	686.59	0	82.60	744.77
1330	J-560	584,062.95	5,933,663.17	698.76	0.35	65.30	744.73
1333	J-561	582,080.53	5,931,638.76	710.00	0	74.70	762.63
1336	J-562	582,569.27	5,933,781.52	685	0.04	84.8	744.72
1339	J-563	583,023.88	5,933,806.52	689.56	0.8	78.2	744.68
1342	J-564	583,338.73	5,933,881.24	692.98	0	73.4	744.66
1345	J-565	582,744.06	5,932,889.49	701.99	0	60.7	744.77

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1348	J-566	582,939.07	5,932,645.59	708.52	0.01	51.5	744.78
1351	J-567	583,002.33	5,932,556.57	709	0.04	50.8	744.78
1353	J-568	581,247.75	5,932,942.22	695.05	0.43	70.6	744.81
1356	J-569	580,577.37	5,932,096.86	705.31	0	56.2	744.93
1359	J-570	580,889.17	5,932,276.53	705.71	0	55.6	744.87
1362	J-571	580,880.65	5,932,177.12	706.82	0	54	744.89
1366	J-573	579,703.90	5,930,618.74	710	0.15	74.4	762.39
1369	J-574	579,904.79	5,930,431.14	710	1.5	74.2	762.25
1372	J-575	580,334.11	5,930,381.44	712.92	0	69.7	762.02
1375	J-576	581,433.82	5,929,694.07	715	1.34	66.6	761.95
1385	J-577	578,886.69	5,931,210.46	705	0	84.9	764.84
1387	J-578	580,835.80	5,932,122.19	707.37	0	53.3	744.9
1390	J-579	579,380.19	5,933,203.20	681.18	0	90.2	744.7
1395	J-582	579,207.27	5,933,179.51	680.57	3.34	91	744.7
1399	J-584	583,409.70	5,930,823.23	715	0	64.6	760.53
1401	J-585	583,613.66	5,930,025.23	708.86	0	73.6	760.73
1405	J-586	581,295.24	5,929,939.38	715	0.08	66.6	761.95
1410	J-588	582,796.31	5,931,225.82	716.44	1.2	66.9	763.6
1422	J-590	582,460.14	5,928,520.74	720	11.82	58.9	761.52
1425	J-591	583,549.35	5,932,202.80	710	10.36	71.3	760.2
1428	J-592	578,708.52	5,931,205.20	706.2	1.71	82.8	764.53
1449	J-601	579,260.41	5,934,216.98	664.6	2.2	72	715.29
1452	J-602	579,239.65	5,934,831.22	656.38	0	83.6	715.3
1459	J-604	580,481.32	5,934,271.82	664.6	2.21	72	715.31
1473	J-607	579,543.45	5,929,983.64	715	0	66.8	762.06
1475	J-608	580,203.48	5,929,958.96	713.28	0	69.2	762.05
1478	J-609	580,201.01	5,929,860.38	713.35	0	69.1	762.05
1480	J-610	580,552.48	5,929,989.36	715	0.58	66.6	761.94
1483	J-611	580,325.86	5,930,727.51	710	0	73.9	762.09
1499	J-613	584,353.40	5,933,669.57	695.76	8.61	69.5	744.74
1504	J-614	582,934.11	5,932,889.06	702.94	1.57	59.4	744.78
1526	J-619	583,965.70	5,931,182.45	713.27	6.21	66.7	760.26
1529	J-620	583,426.67	5,930,620.38	719.95	0	57.7	760.58
1542	J-622	584,014.70	5,930,037.23	715	0	64.8	760.62
1545	J-623	579,142.16	5,929,148.03	715	0	66.4	761.75
1548	J-624	580,979.44	5,929,436.53	710	0	73.7	761.94
1552	J-626	582,439.40	5,929,055.55	714.43	0	66.9	761.54
1556	J-628	580,375.92	5,929,164.92	717.44	0	62.9	761.72
1559	J-629	580,365.57	5,929,526.73	705	0	80.7	761.82
1563	J-631	580,387.52	5,927,986.11	715	1.11	66.1	761.55
1604	J-632	580,288.92	5,933,147.51	687.49	0	81.3	744.79
1619	J-634	580,375.70	5,929,000.34	718.77	0	60.9	761.67
1623	J-635	582,786.29	5,930,481.33	720	12.15	59.3	761.8
1681	J-642	581,668.12	5,929,095.99	715	0	66.2	761.63
1711	J-644	583,046.25	5,935,496.03	657.92	2.32	82.3	715.88
1741	J-647	581,271.30	5,929,015.97	720	0	59.1	761.62
1744	48 (Dum	581,275.92	5,928,657.02	720	2.05	59.1	761.62

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1746	J-649	581,116.31	5,928,684.12	720	0	59.1	761.62
1748	J-650	581,110.60	5,929,012.69	721.17	0	57.4	761.63
1857	J-662	581,970.85	5,935,022.33	659.84	0.12	79	715.5
1859	J-663	582,116.21	5,935,056.50	657.14	0.15	82.9	715.53
1930	J-668	579,102.84	5,931,112.30	705.76	0.75	83.3	764.45
1933	J-669	583,535.99	5,932,752.55	705	5.4	56.6	744.88
1936	J-670	583,961.86	5,933,365.46	700	2.81	63.5	744.73
1938	J-671	583,518.52	5,931,175.41	715	5.95	64.6	760.48
1941	J-672	584,343.63	5,931,657.91	705	6.09	78.1	760
1944	J-673	580,373.82	5,928,781.54	710.94	1	72	761.65
1947	J-674	584,337.86	5,932,018.97	706.68	11.59	75.8	760.06
1949	J-675	579,907.29	5,930,219.27	710	1.5	74.1	762.18
1952	J-676	580,043.39	5,929,961.76	711.5	0.46	71.8	762.08
1955	J-677	581,118.82	5,928,478.68	720	4.21	59.1	761.61
1956	J-678	580,803.49	5,928,525.59	713.58	0	68.2	761.6
1957	J-679	580,802.56	5,928,372.79	716.43	0	64.1	761.6
1959	J-681	580,378.87	5,928,367.84	710	0	73.2	761.6
1965	J-682	578,966.18	5,934,323.21	662.52	0.57	74.9	715.29
1969	J-683	580,796.56	5,933,569.23	687.51	2.89	81.3	744.77
1970	J-684	580,269.86	5,933,725.09	675.19	1.28	98.8	744.78
1974	J-685	580,448.50	5,933,230.44	686.51	3.37	82.7	744.78
1977	J-686	580,280.05	5,933,437.59	680.95	1.69	90.6	744.78
1980	J-687	580,334.63	5,930,185.02	714.34	0.32	67.6	761.99
1983	J-688	580,557.45	5,930,744.75	710	0.46	73.9	762.08
1986	J-689	581,209.13	5,929,990.60	715	1.2	66.6	761.95
1989	J-690	582,115.87	5,934,642.64	664.96	1.11	71.8	715.52
1995	J-692	580,367.90	5,935,411.75	655	0.57	85.6	715.3
1998	J-693	580,939.14	5,935,207.44	655	0.09	85.6	715.33
2001	J-694	581,593.23	5,933,015.33	699.23	1.25	64.7	744.78
2004	J-695	581,706.64	5,932,861.89	698.36	1.5	65.9	744.79
2007	J-696	585,110.51	5,930,733.81	710	1.29	71.7	760.53
2009	J-697	580,594.61	5,929,003.29	722.94	1.84	55	761.66
2012	J-698	579,772.86	5,930,616.65	710	0.33	74.3	762.37
2015	J-699	581,656.96	5,929,786.31	715	0.18	66.7	761.99
2020	J-700	584,566.88	5,934,158.53	695	0.25	53	732.37
2024	J-701	579,705.90	5,933,212.88	682	2.69	89	744.7
2027	J-702	582,798.78	5,931,094.66	716	5.9	67.4	763.49
2030	J-703	583,042.23	5,935,001.28	669.77	1.84	65.5	715.89
2048	J-709	584,218.05	5,933,682.14	696.07	0	69.1	744.73
2064	J-713	584,319.60	5,931,332.55	708.64	0	73.1	760.11
2071	J-715	583,984.76	5,930,837.44	713.33	0	67	760.54
2093	J-718	583,981.82	5,932,017.05	712	0	68.4	760.21
2142	J-719	582,112.92	5,929,042.77	714.67	0	66.6	761.57
2145	J-720	581,900.54	5,929,036.19	714.83	0	66.4	761.59
2148	J-721	585,115.48	5,935,430.98	672.05	0	63.8	716.98
2153	J-723	581,364.59	5,933,637.12	683.4	0	87.1	744.77
2155	J-724	581,503.77	5,933,636.39	683.4	0	87.1	744.77

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
2157	J-725	581,505.07	5,933,898.96	680	0	91.9	744.77

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
654	P-120	J-102	J-116	63.00	200	120.00	-0.02	0	0	0	PVC
655	P-156	J-147	J-148	80.00	200	120.00	1.37	0.04	0.002	0.02	PVC
656	P-78	J-73	J-74	58.00	200	120.00	-4.11	0.13	0.008	0.145	PVC
657	P-95	J-90	J-91	95.00	200	120.00	-6.65	0.21	0.034	0.355	PVC
658	P-74	J-69	J-70	140.00	200	120.00	-2.24	0.07	0.007	0.047	PVC
659	P-201	J-191	J-192	96.00	300	120.00	0.00	0	0	0	PVC
660	P-5	J-5	J-7	173.00	200	120.00	14.68	0.47	0.266	1.538	PVC
661	P-119	J-115	J-109	130.00	200	120.00	1.00	0.03	0.001	0.011	PVC
662	P-307(2)	J-471	J-470	147.00	300	120.00	-6.60	0.09	0.007	0.049	PVC
663	P-216	J-205	J-206	353.00	300	120.00	-7.29	0.1	0.015	0.058	PVC
664	P-124	J-119	J-110	95.00	200	120.00	0.27	0.01	0	0.001	PVC
665	P-17	J-17	J-18	122.00	300	110.00	8.16	0.12	0.01	0.084	Asbestos Cement
666	P-11	J-11	J-12	113.00	300	120.00	15.22	0.22	0.024	0.228	PVC
667	P-73	J-68	J-69	169.00	200	120.00	-2.12	0.07	0.007	0.043	PVC
668	P-235	J-223	J-224	98.00	300	120.00	-5.32	0.08	0.003	0.033	PVC
669	P-46	J-44	J-45	77.00	300	110.00	-4.61	0.07	0.003	0.029	Asbestos Cement
670	P-152	J-131	J-145	12.00	200	120.00	-3.02	0.1	0.001	0.084	PVC
671	P-141	J-134	J-135	126.00	150	120.00	0.30	0.02	0.001	0.005	PVC
672	P-30	J-28	J-29	73.00	300	110.00	7.25	0.1	0.005	0.068	Asbestos Cement
673	P-195	J-185	J-186	131.00	300	120.00	4.23	0.06	0.003	0.022	PVC
674	P-306(2)	J-472	J-471	85.00	300	120.00	-6.60	0.09	0.003	0.048	PVC
675	P-215	J-204	J-205	197.00	300	120.00	-7.29	0.1	0.011	0.058	PVC
676	P-159	J-150	J-151	35.00	200	120.00	0.18	0.01	0	0.002	PVC
677	P-16	J-13	J-17	156.00	300	110.00	8.16	0.12	0.013	0.085	Asbestos Cement
678	P-160	J-151	J-152	71.00	200	120.00	0.13	0	0	0	PVC
679	P-110	J-106	J-107	37.00	200	120.00	-0.22	0.01	0	0.002	PVC
680	P-10	J-10	J-11	167.00	300	120.00	15.43	0.22	0.041	0.234	PVC
681	P-234	J-222	J-223	81.00	300	120.00	-5.30	0.08	0.003	0.033	PVC
682	P-72	J-67	J-58	158.00	300	110.00	13.63	0.19	0.036	0.219	Asbestos Cement
683	P-135	J-128	J-129	126.00	150	120.00	0.61	0.03	0.002	0.018	PVC
684	P-26	J-25 (Dummy)	J-26	119.00	300	110.00	-4.26	0.06	0.003	0.026	Asbestos Cement
685	P-172	J-162	J-163	145.00	300	120.00	-6.64	0.09	0.007	0.049	PVC
686	P-140	J-133	J-134	114.00	200	120.00	0.38	0.01	0	0.002	PVC
687	P-158	J-149	J-150	30.00	200	120.00	0.18	0.01	0	0	PVC
688	P-52	J-49	J-50	146.00	300	110.00	5.24	0.07	0.005	0.037	Asbestos Cement
689	P-148	J-129	J-141	83.00	150	120.00	0.00	0	0	0	PVC
690	P-182	J-173	J-174	102.00	200	120.00	1.03	0.03	0.001	0.011	PVC
691	P-282	J-252	J-253	357.00	300	120.00	1.20	0.02	0.001	0.002	HDPE
692	P-217	J-206	J-207	75.00	300	120.00	-18.31	0.26	0.054	0.321	PVC
693	P-15	J-15	J-16	51.00	300	110.00	9.83	0.14	0.006	0.119	Asbestos Cement
694	P-109	J-99	J-106	76.00	200	120.00	-0.14	0	0	0	PVC
695	P-142	J-135	J-136	88.00	200	120.00	2.48	0.08	0.005	0.057	PVC
696	P-181	J-172	J-173	65.00	200	120.00	2.47	0.08	0.004	0.058	PVC
697	P-71	J-66	J-67	156.00	300	110.00	13.64	0.19	0.032	0.218	Asbestos Cement
698	P-193	J-183	J-184	75.00	300	120.00	4.68	0.07	0.002	0.026	PVC
699	P-238	J-226	J-227	86.00	300	120.00	3.37	0.05	0.002	0.014	PVC
700	P-157	J-148	J-149	48.00	200	120.00	0.47	0.01	0	0.002	PVC
701	P-75	J-70	J-71	128.00	200	120.00	0.26	0.01	0	0.001	PVC
702	P-147	J-129	J-140	62.00	150	120.00	3.28	0.19	0.024	0.388	PVC
703	P-129	J-122	J-123	62.00	200	120.00	-1.41	0.04	0.001	0.019	PVC
704	P-92	J-87	J-88	83.00	200	120.00	-6.31	0.2	0.029	0.322	PVC
705	P-171	J-161	J-162	175.00	300	120.00	-6.64	0.09	0.009	0.049	PVC
706	P-206	J-196	J-197	78.00	300	120.00	0.90	0.01	0	0.001	PVC
707	P-45	J-43	J-44	40.00	300	110.00	0.74	0.01	0	0.002	Asbestos Cement
708	P-258	PMP-101	J-234	2.00	150	120.00	0.00	0	0	0	PVC
709	P-276	J-248	J-211	11.00	300	120.00	25.92	0.37	0.017	0.613	PVC
710	P-189	J-179	J-180 (Dummy)	237.00	350	120.00	-9.62	0.1	0.01	0.046	PVC
711	P-33	J-31	J-32	76.00	300	110.00	12.42	0.18	0.014	0.184	Asbestos Cement
712	P-84	J-79	J-80 (Dummy)	386.00	250	120.00	-6.49	0.13	0.044	0.114	PVC
713	P-255	PMP-104	J-237	2.00	250	120.00	0.00	0	0	0	PVC
714	P-29	J-27	J-28	77.00	300	110.00	7.25	0.1	0.005	0.068	Asbestos Cement
715	P-118	J-114	J-115	108.00	200	120.00	1.05	0.03	0.001	0.012	PVC
716	P-9	J-5	J-10	137.00	200	120.00	15.60	0.5	0.233	1.72	PVC
718	P-229	J-217	J-218	31.00	300	120.00	-27.23	0.39	0.021	0.67	PVC
719	P-265	J-241	PMP-103	2.00	600	120.00	0.00	0	0	0	PVC
720	P-210	J-200	J-201	211.00	300	120.00	1.63	0.02	0.001	0.004	PVC
721	P-232	J-220	J-221	94.00	300	120.00	-5.30	0.07	0.003	0.032	PVC
722	P-32	J-30	J-31	86.00	300	110.00	7.18	0.1	0.006	0.067	Asbestos Cement
723	P-108	J-96	J-105	160.00	200	120.00	0.14	0	0	0	PVC
724	P-133	J-126	J-127	125.00	150	120.00	0.91	0.05	0.005	0.037	PVC
725	P-174	J-164	J-165	87.00	300	120.00	-11.64	0.16	0.012	0.138	PVC
726	P-134	J-127	J-128	116.00	150	120.00	0.82	0.05	0.003	0.03	PVC
727	P-190	J-180 (Dummy)	J-181	119.00	350	120.00	-3.60	0.04	0.001	0.007	PVC
728	P-211	J-201	J-202	129.00	360	120.00	8.70	0.09	0.004	0.033	HDPE
729	P-300	OLD FIRE PUMP	J-265	145.00	300	120.00	0.00	0	0	0	PVC
730	P-144	J-122	J-137	191.00	200	120.00	-0.56	0.02	0.001	0.004	PVC
731	P-231	J-219	J-220	100.00	300	120.00	-5.06	0.07	0.003	0.029	PVC
732	P-70	J-65	J-66	106.00	300	110.00	-9.57	0.14	0.013	0.113	Asbestos Cement
733	P-35	J-33	J-34	60.00	300	110.00	12.33	0.17	0.01	0.182	Asbestos Cement
734	P-117	J-113	J-114	51.00	200	120.00	-0.82	0.03	0	0.007	PVC
735	P-184	J-175	J-177	34.00	200	120.00	0.86	0.03	0	0.009	PVC
736	P-112	J-108	J-109	88.00	200	120.00	-0.26	0.01	0	0.001	PVC
737	P-150	J-141	J-143	23.00	150	120.00	0.00	0	0	0	PVC
738	P-177	J-167	J-168	458.00	300	120.00	-12.84	0.18	0.066	0.167	PVC
739	P-115	J-97	Lakeshore	143.00	200	120.00	-0.66	0.02	0.001	0.005	PVC
740	P-192	J-182	J-183	257.00	350	120.00	-9.01	0.09	0.011	0.041	PVC
741	P-251	J-235	J-236	2.00	400	120.00	0.00	0	0	0	PVC
742	P-68	J-63	Acheson Zone 3	124.00	300	110.00	-9.34	0.13	0.013	0.108	Asbestos Cement
743	P-309	J-469	J-468 (Dummy)	89.00	300	120.00	-6.60	0.09	0.004	0.049	PVC
744	P-146	J-128	J-139	63.00	150	120.00	0.10	0.01	0	0.001	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
745	P-97	J-93	J-94	73.00	200	120.00	-0.78	0.02	0	0.006	PVC
746	P-237	J-224	J-226	96.00	300	120.00	3.42	0.05	0.001	0.015	PVC
747	P-128	J-121	J-122	38.00	200	120.00	-1.92	0.06	0.002	0.036	PVC
748	P-22	J-21	J-22	200.00	300	110.00	5.20	0.07	0.007	0.037	Asbestos Cement
749	P-122	J-117	J-118	130.00	200	120.00	-0.23	0.01	0	0.001	PVC
750	P-230	J-183	J-219	149.00	300	120.00	-4.99	0.07	0.005	0.029	PVC
751	P-104	J-100	J-101	111.00	200	120.00	0.28	0.01	0	0.001	PVC
753	P-61	J-57	J-58	116.00	300	110.00	-5.11	0.07	0.004	0.035	Asbestos Cement
754	P-126	J-114	J-120	75.00	200	120.00	-1.88	0.06	0.003	0.034	PVC
755	P-28	J-22	J-27	72.00	300	110.00	7.33	0.1	0.005	0.069	Asbestos Cement
756	P-44	J-42	J-43	77.00	300	110.00	0.74	0.01	0	0.001	Asbestos Cement
757	P-197	J-187	J-188	74.00	300	120.00	4.17	0.06	0.001	0.021	PVC
758	P-20	J-19	J-20	49.00	300	110.00	5.33	0.08	0.002	0.037	Asbestos Cement
759	P-80	J-75	J-76	179.00	200	120.00	-0.81	0.03	0.001	0.007	PVC
760	P-261	J-241	J-242	2.00	600	120.00	0.00	0	0	0	PVC
761	P-298	J-234	J-265	2.00	300	120.00	0.00	0	0	0	PVC
762	P-102	J-98	J-99	87.00	200	120.00	0.50	0.02	0	0.003	PVC
763	P-254	J-238	PMP-105	2.00	250	120.00	0.00	0	0	0	PVC
764	P-291	J-192	J-264	218.00	300	120.00	0.33	0	0	0	PVC
765	P-281	J-14	J-259	44.00	300	120.00	-2.97	0.04	0.001	0.011	PVC
766	P-64	J-60	J-40	31.00	300	110.00	6.67	0.09	0.002	0.059	Asbestos Cement
767	P-3	J-3	J-4	65.00	300	120.00	30.28	0.43	0.056	0.816	PVC
768	P-83	J-78	J-79	214.00	250	120.00	-6.49	0.13	0.024	0.114	PVC
769	P-14	J-14	J-15	120.00	300	110.00	10.01	0.14	0.011	0.123	Asbestos Cement
770	P-58	J-54	J-55	167.00	300	110.00	-12.16	0.17	0.03	0.177	Asbestos Cement
771	P-55	J-51	J-52	57.00	300	110.00	-12.06	0.17	0.009	0.174	Asbestos Cement
772	P-167	J-157	J-158	22.00	250	120.00	-7.36	0.15	0.003	0.146	PVC
773	P-137	J-130	J-131	98.00	200	120.00	-2.91	0.09	0.008	0.077	PVC
774	P-105	J-101	J-102	98.00	200	120.00	0.15	0	0	0	PVC
775	P-101	J-97	J-98	173.00	200	120.00	0.59	0.02	0.001	0.004	PVC
776	P-188	J-178	J-179	247.00	350	120.00	-9.62	0.1	0.011	0.046	PVC
777	P-228	J-217	J-66	67.00	300	120.00	27.23	0.39	0.042	0.671	PVC
778	P-38	J-36	J-37	94.00	300	110.00	-10.36	0.15	0.012	0.132	Asbestos Cement
779	P-41	J-39	J-40	154.00	300	110.00	-10.39	0.15	0.021	0.132	Asbestos Cement
780	P-154	J-145	J-146	133.00	200	120.00	-3.66	0.12	0.015	0.117	PVC
781	P-63	J-59	J-60	123.00	300	110.00	6.67	0.09	0.007	0.058	Asbestos Cement
782	P-164	J-149	J-156	36.00	200	120.00	0.23	0.01	0	0.002	PVC
784	P-287	J-257	J-255	556.00	200	120.00	-0.77	0.02	0.003	0.007	HDPE
785	P-59	J-55	J-56 (Dummy)	74.00	300	110.00	-3.06	0.04	0.001	0.014	Asbestos Cement
786	P-243	J-231	J-73	144.00	200	120.00	-1.34	0.04	0.003	0.019	PVC
787	P-264	J-242	PMP-102	2.00	600	120.00	0.00	0	0	0	PVC
788	P-7	J-7	J-8	371.00	300	120.00	14.66	0.21	0.078	0.213	PVC
789	P-268	R-1	J-239	2.00	600	120.00	0.00	0	0	0	PVC
790	P-88	J-83	J-84	56.00	200	120.00	-4.85	0.15	0.017	0.198	PVC
791	P-121	J-116	J-117	92.00	200	120.00	-0.12	0	0	0	PVC
792	P-79	J-74	J-75	142.00	200	120.00	-4.11	0.13	0.021	0.145	PVC
793	P-24	J-23	J-24	158.00	300	110.00	-2.21	0.03	0.001	0.008	Asbestos Cement
794	P-47	J-45	J-46	103.00	300	110.00	-4.67	0.07	0.003	0.031	Asbestos Cement
795	P-31	J-29	J-30	83.00	300	110.00	7.24	0.1	0.006	0.067	Asbestos Cement
796	P-196	J-186	J-187	92.00	300	120.00	4.23	0.06	0.002	0.021	PVC
797	P-107	J-94	J-104	107.00	200	120.00	-1.06	0.03	0.001	0.012	PVC
799	P-161	J-152	J-153	68.00	200	120.00	0.24	0.01	0	0.001	PVC
800	P-250	J-234	J-235	2.00	400	120.00	0.00	0	0	0	PVC
801	P-136	J-129	J-130	187.00	200	120.00	-2.83	0.09	0.014	0.073	PVC
802	P-27	J-26	J-16	95.00	300	110.00	-9.83	0.14	0.012	0.12	Asbestos Cement
803	P-173	J-163	J-164	99.00	300	120.00	-9.32	0.13	0.009	0.092	PVC
804	P-66	J-61	J-62	112.00	300	110.00	-9.22	0.13	0.012	0.106	Asbestos Cement
805	P-284	J-68	J-255	311.00	200	120.00	2.00	0.06	0.013	0.038	HDPE
806	P-257	PMP-102	J-235	2.00	150	120.00	0.00	0	0	0	PVC
807	P-218	J-207	J-208	408.00	300	120.00	7.50	0.11	0.027	0.062	PVC
808	P-239	J-227	J-228	96.00	300	120.00	1.74	0.02	0	0.004	PVC
809	P-18	J-18	J-8	31.00	300	110.00	2.84	0.04	0	0.012	Asbestos Cement
811	P-130	J-123	J-124	65.00	200	120.00	-1.43	0.05	0.001	0.021	PVC
812	P-143	J-136	J-126	89.00	200	120.00	2.48	0.08	0.005	0.057	PVC
813	P-93	J-88	J-89	68.00	200	120.00	-6.45	0.21	0.02	0.336	PVC
814	P-207	J-197	J-198	121.00	300	120.00	0.67	0.01	0	0.001	PVC
815	P-149	J-141	J-142	40.00	150	120.00	0.00	0	0	0	PVC
816	P-259	J-239	J-240	2.00	600	120.00	0.00	0	0	0	PVC
817	P-34	J-32	J-33	60.00	300	110.00	12.34	0.17	0.012	0.181	Asbestos Cement
818	P-85	J-80 (Dummy)	J-81	125.00	250	120.00	-8.53	0.17	0.024	0.19	PVC
819	P-256	PMP-103	J-236	2.00	200	120.00	0.00	0	0	0	PVC
820	P-183	J-174	J-175	119.00	200	120.00	0.92	0.03	0.001	0.009	PVC
821	P-266	J-240	PMP-104	2.00	600	120.00	0.00	0	0	0	PVC
822	P-111	J-107	J-108	99.00	200	120.00	-0.22	0.01	0	0	PVC
823	P-308(2)	J-470	J-469	207.00	300	120.00	-6.60	0.09	0.01	0.048	PVC
824	P-233	J-221	J-222	79.00	300	120.00	-5.30	0.08	0.003	0.032	PVC
825	P-175	J-165	J-166	352.00	300	120.00	-39.98	0.57	0.405	1.364	PVC
826	P-53	J-50	J-31	149.00	300	110.00	5.24	0.07	0.006	0.037	Asbestos Cement
827	P-96	J-86	J-92	190.00	200	120.00	0.07	0	0	0	PVC
828	P-191	J-181	J-182	234.00	350	120.00	-6.99	0.07	0.004	0.026	PVC
831	P-145	J-138	J-128	73.00	150	120.00	0.00	0	0	0	PVC
832	P-273	J-218	J-246	35.00	300	120.00	-27.23	0.39	0.02	0.67	PVC
833	P-185	J-177	J-170	76.00	200	120.00	2.56	0.08	0.005	0.06	PVC
834	P-213	J-201	J-203	142.00	300	120.00	-7.07	0.1	0.008	0.055	PVC
835	P-114	J-110	J-111	107.00	200	120.00	0.14	0	0	0.001	PVC
836	P-178	J-168	J-169	64.00	300	120.00	-13.81	0.2	0.024	0.191	PVC
837	P-151	J-143	J-144	26.00	150	120.00	0.00	0	0	0	PVC
838	P-67	J-62	J-63	99.00	300	110.00	-9.22	0.13	0.01	0.106	Asbestos Cement
839	P-310(2)	J-468 (Dummy)	J-467	69.00	300	120.00	-8.64	0.12	0.006	0.08	PVC
840	P-42	J-40	J-41	91.00	300	110.00	0.83	0.01	0	0.002	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
841	P-123	J-109	J-119	21.00	200	120.00	0.66	0.02	0	0.004	PVC
842	P-12	J-12	J-13	89.00	300	120.00	15.22	0.22	0.021	0.228	PVC
843	P-127	J-120	J-121	205.00	200	120.00	-1.88	0.06	0.007	0.034	PVC
844	P-39	J-37	J-38	110.00	300	110.00	-10.37	0.15	0.015	0.132	Asbestos Cement
845	P-198	J-76	J-189	340.00	250	120.00	5.68	0.12	0.03	0.089	PVC
846	P-21	J-20	J-21	62.00	300	110.00	5.31	0.08	0.002	0.038	Asbestos Cement
847	P-252	J-236	J-237	2.00	400	120.00	0.00	0	0	0	PVC
848	P-81	J-76	J-77	87.00	250	120.00	-6.49	0.13	0.01	0.114	PVC
849	P-293	J-264	J-261	179.00	300	120.00	-1.50	0.02	0.001	0.003	PVC
850	P-236	J-224	J-225	82.00	300	120.00	2.04	0.03	0.001	0.006	PVC
851	P-69	Acheson Zone 3	J-65	123.00	300	110.00	-9.57	0.14	0.014	0.114	Asbestos Cement
852	P-65	J-55	J-61	151.00	300	110.00	-9.20	0.13	0.016	0.106	Asbestos Cement
853	P-4	J-4	J-5	124.00	300	120.00	30.28	0.43	0.101	0.815	PVC
854	P-168	J-158	J-159	265.00	300	120.00	-7.36	0.1	0.016	0.059	PVC
855	P-56	J-52	J-53	70.00	300	110.00	-12.06	0.17	0.013	0.174	Asbestos Cement
856	P-139	J-132	J-133	106.00	200	120.00	0.57	0.02	0	0.003	PVC
857	P-36	J-34	J-35	61.00	300	110.00	12.33	0.17	0.012	0.181	Asbestos Cement
858	P-103	J-99	J-100	157.00	200	120.00	0.44	0.01	0	0.002	PVC
859	P-98	J-94	J-95	59.00	200	120.00	0.28	0.01	0	0.001	PVC
860	P-116	Lakeshore	J-113	107.00	200	120.00	-0.82	0.03	0.001	0.008	PVC
861	P-305(2)	J-262	J-472	275.00	300	120.00	-0.91	0.01	0	0.001	PVC
863	P-165	J-156	J-152	29.00	200	120.00	0.23	0.01	0	0	PVC
864	P-221	J-210	J-211	208.00	300	120.00	-25.92	0.37	0.127	0.612	PVC
865	P-60	J-56 (Dummy)	J-57	133.00	300	110.00	-5.11	0.07	0.005	0.036	Asbestos Cement
866	P-244	J-135	J-232	151.00	200	120.00	-2.36	0.08	0.008	0.052	PVC
867	P-106	J-102	J-103	82.00	200	120.00	0.10	0	0	0	PVC
868	P-269	J-35	J-244	73.00	350	120.00	34.56	0.36	0.012	0.491	PVC
869	P-89	J-84	J-85	64.00	200	120.00	-4.88	0.16	0.013	0.2	PVC
870	P-25	J-24	J-25 (Dummy)	124.00	300	110.00	-2.21	0.03	0.001	0.007	Asbestos Cement
871	P-23	J-22	J-23	47.00	300	110.00	-2.18	0.03	0	0.008	Asbestos Cement
872	P-37	J-35	J-36	106.00	300	110.00	-10.36	0.15	0.014	0.131	Asbestos Cement
873	P-43	J-41	J-42	45.00	300	110.00	0.79	0.01	0	0	Asbestos Cement
874	P-19	J-18	J-19	89.00	300	110.00	5.33	0.08	0.003	0.039	Asbestos Cement
876	P-77	J-70	J-73	144.00	200	120.00	-2.58	0.08	0.009	0.061	PVC
877	P-94	J-89	J-90	141.00	200	120.00	-6.50	0.21	0.049	0.34	PVC
878	P-260	J-240	J-241	2.00	600	120.00	0.00	0	0	0	PVC
879	P-267	J-239	PMP-105	2.00	600	120.00	0.00	0	0	0	PVC
880	P-297	J-243	OLD FIRE PUMP	4.00	500	120.00	0.00	0	0	0	PVC
881	P-253	J-237	J-238	2.00	400	120.00	0.00	0	0	0	PVC
882	P-186	J-176	J-177	48.00	200	120.00	1.70	0.05	0.001	0.029	PVC
883	P-86	J-81	J-82	220.00	200	120.00	-0.36	0.01	0	0.002	PVC
884	P-274	J-246	J-247	370.00	300	120.00	25.92	0.37	0.225	0.612	PVC
885	P-214	J-203	J-204	29.00	300	120.00	-7.29	0.1	0.002	0.058	PVC
886	P-311(2)	J-467	J-466	82.00	300	120.00	-9.01	0.13	0.007	0.087	PVC
887	P-194	J-184	J-185	66.00	300	120.00	4.58	0.06	0.002	0.024	PVC
888	P-40	J-38	J-39	44.00	300	110.00	-10.39	0.15	0.006	0.133	Asbestos Cement
889	P-199	J-189	J-190	318.00	300	120.00	0.00	0	0	0	PVC
890	P-162	J-153	J-154	39.00	200	120.00	0.32	0.01	0	0	PVC
891	P-82	J-77	J-78	43.00	250	120.00	-6.49	0.13	0.005	0.114	PVC
892	P-54	J-35	J-51	62.00	300	110.00	-11.86	0.17	0.011	0.169	Asbestos Cement
893	P-57	J-53	J-54	91.00	300	110.00	-12.15	0.17	0.016	0.176	Asbestos Cement
894	P-99	J-95	J-96	66.00	200	120.00	0.25	0.01	0	0	PVC
895	P-166	J-147	J-157	23.00	200	120.00	-7.32	0.23	0.01	0.423	PVC
896	P-222	J-211	J-212	47.00	300	120.00	0.00	0	0	0	PVC
897	P-245	J-133	J-233	76.00	200	120.00	0.11	0	0	0.001	PVC
898	P-1	J-1	J-2	158.00	300	120.00	30.88	0.44	0.143	0.846	PVC
899	P-90	J-85	J-86	140.00	200	120.00	-6.17	0.2	0.042	0.309	PVC
900	P-13	J-13	J-14	30.00	300	110.00	7.04	0.1	0.003	0.065	Asbestos Cement
901	P-48	J-46	J-47	139.00	300	110.00	-4.67	0.07	0.004	0.03	Asbestos Cement
903	P-155	J-146	J-147	23.00	200	120.00	-3.66	0.12	0.003	0.119	PVC
904	P-302(2)	J-259	J-461	628.00	300	120.00	-3.32	0.05	0.005	0.014	PVC
905	P-240	J-208	J-230	357.00	300	120.00	-2.74	0.04	0.003	0.009	PVC
906	P-187	J-168	J-178	363.00	350	120.00	-9.43	0.1	0.016	0.044	PVC
907	P-262	J-242	J-243	2.00	600	120.00	0.00	0	0	0	PVC
908	P-275	J-247	J-248	75.00	300	120.00	25.92	0.37	0.046	0.612	PVC
909	P-312(2)	J-466	J-465	94.00	300	120.00	-9.01	0.13	0.008	0.086	PVC
910	P-153	J-145	J-132	114.00	200	120.00	0.64	0.02	0.001	0.005	PVC
911	P-62	J-58	J-59	127.00	300	110.00	8.49	0.12	0.012	0.091	Asbestos Cement
912	P-163	J-154	J-155	61.00	200	120.00	0.23	0.01	0	0.001	PVC
913	P-208	J-198	J-199	68.00	300	120.00	0.02	0	0	0	PVC
914	P-100	J-96	J-97	141.00	200	120.00	0.02	0	0	0	PVC
915	P-91	J-86	J-87	166.00	200	120.00	-6.31	0.2	0.054	0.322	PVC
916	P-49	J-47	J-26	98.00	300	110.00	-4.68	0.07	0.003	0.03	Asbestos Cement
917	P-314(2)	J-464	J-230	207.00	300	120.00	2.77	0.04	0.002	0.01	PVC
918	P-242	J-229	J-230	45.00	250	120.00	-0.03	0	0	0	PVC
919	P-6	J-7	J-6	24.00	200	120.00	0.02	0	0	0	PVC
920	P-263	J-243	PMP-101	2.00	600	120.00	0.00	0	0	0	PVC
921	P-2	J-2	J-3	142.00	300	120.00	30.54	0.43	0.114	0.828	PVC
922	P-180	J-171	J-172	67.00	200	120.00	2.58	0.08	0.004	0.061	PVC
923	P-50	J-44	J-48	97.00	300	110.00	5.35	0.08	0.004	0.039	Asbestos Cement
924	P-169	J-159	J-160	124.00	300	120.00	-7.36	0.1	0.007	0.059	PVC
925	P-315(2)	J-465	J-464	45.00	300	120.00	-9.01	0.13	0.004	0.087	PVC
926	P-87	J-82	J-83	149.00	200	120.00	-4.74	0.15	0.022	0.189	PVC
927	P-51	J-48	J-49	123.00	300	110.00	5.35	0.08	0.005	0.039	Asbestos Cement
928	P-170	J-160	J-161	104.00	300	120.00	-6.64	0.09	0.005	0.049	PVC
929	P-179	J-163	J-171	113.00	200	120.00	2.68	0.09	0.007	0.066	PVC
930	P-113	J-231	J-125	185.00	200	120.00	1.34	0.04	0.003	0.018	PVC
931	P-203	J-125	J-209	180.00	200	120.00	0.10	0	0	0	PVC
932	P-204	J-125	J-214	107.00	200	120.00	0.00	0	0	0	PVC
933	P-205	J-193	J-215	201.00	300	120.00	6.43	0.09	0.009	0.046	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
934	P-219	J-26	J-216	167.00	200	110.00	0.87	0.03	0.002	0.009	Asbestos Cement
935	P-303	J-193	J-274	39.00	300	120.00	-5.48	0.08	0.001	0.036	PVC
936	P-305	J-274	J-194	198.00	200	120.00	0.09	0	0	0	PVC
937	P-306	J-189	J-274	249.00	300	120.00	5.57	0.08	0.009	0.035	PVC
938	P-307	J-228	J-275	314.00	300	120.00	1.58	0.02	0.001	0.004	PVC
940	P-310	J-188	J-276	110.00	300	120.00	4.17	0.06	0.002	0.02	PVC
941	P-311	J-276	J-182	265.00	300	120.00	-1.90	0.03	0.001	0.005	PVC
942	P-312	J-276	J-277	170.00	300	120.00	6.04	0.09	0.007	0.041	PVC
944	P-314	J-278	J-279 (Dummy)	172.00	300	120.00	-53.16	0.75	0.41	2.313	PVC
945	P-315	J-279 (Dummy)	J-280	255.00	300	120.00	-55.20	0.78	0.566	2.48	PVC
946	P-413	J-369	J-9	217.00	300	120.00	-13.61	0.19	0.033	0.185	PVC
947	P-463	J-119	J-413	36.00	150	120.00	0.39	0.02	0	0.008	PVC
948	P-464	J-413	J-118	118.00	200	120.00	0.39	0.01	0	0.002	PVC
949	P-466	J-414	J-263	264.00	300	120.00	6.09	0.09	0.009	0.042	PVC
950	P-467	J-8	J-415	209.00	300	120.00	17.39	0.25	0.061	0.292	PVC
952	P-469	J-262	J-416	50.00	300	120.00	6.11	0.09	0.003	0.042	PVC
953	P-470	J-416	J-414	71.00	300	120.00	6.11	0.09	0.003	0.042	PVC
954	P-471	J-244	J-417	188.00	600	120.00	34.55	0.12	0.013	0.036	HDPE
955	P-472	J-417	J-418	70.00	600	120.00	37.70	0.13	0.003	0.043	PVC
956	P-483	J-216	J-426	467.00	200	110.00	0.87	0.03	0.005	0.01	Asbestos Cement
957	P-485	J-427	J-66	310.00	200	110.00	-4.02	0.13	0.05	0.164	Asbestos Cement
961	P-494	J-238	PRV-4	3.00	350	120.00	0.00	0	0	0	PVC
962	P-495	PRV-4	J-244	3.00	350	120.00	0.00	0	0	0	PVC
963	P-496	PRV-5	J-280	37.00	400	120.00	224.91	1.79	1.012	8.235	PVC
965	P-500	J-433	J-427	244.00	200	110.00	-3.73	0.12	0.035	0.143	Asbestos Cement
966	P-501	J-40	J-433	147.00	300	110.00	-4.56	0.06	0.004	0.029	Asbestos Cement
967	P-502	J-225	J-317	106.00	300	120.00	2.04	0.03	0.001	0.006	PVC
968	P-529	J-461	J-542	318.00	300	120.00	-3.40	0.05	0.002	0.014	PVC
971	P-536	J-202	J-183	115.00	350	120.00	8.70	0.09	0.007	0.038	PVC
972	P-597	J-232	J-455	163.00	200	120.00	-0.51	0.02	0	0.003	PVC
973	P-598	J-137	J-456	53.00	200	120.00	-0.69	0.02	0	0.006	PVC
974	P-599	J-456	J-457	147.00	200	120.00	2.52	0.08	0.009	0.059	PVC
975	P-600	J-457	J-458	105.00	200	120.00	0.02	0	0	0	PVC
976	P-601	J-458	J-459	75.00	200	120.00	0.00	0	0	0	PVC
977	P-602	J-457	J-460	112.00	200	120.00	1.23	0.04	0.002	0.015	PVC
978	P-603	J-457	J-462	99.00	200	120.00	1.22	0.04	0.001	0.015	PVC
979	P-604	J-462	J-473	83.00	200	120.00	1.20	0.04	0.001	0.015	PVC
982	P-607	J-263	J-261	199.00	300	120.00	3.20	0.05	0.003	0.013	PVC
983	P-608	J-263	J-474	104.00	300	120.00	2.89	0.04	0.001	0.01	PVC
984	P-609	J-155	J-475	48.00	200	120.00	0.15	0	0	0	PVC
985	P-610	J-475	J-476	99.00	200	120.00	0.15	0	0	0	PVC
986	P-611	J-476	J-477	118.00	200	120.00	0.15	0	0	0.001	PVC
987	P-612	J-477	J-478	106.00	200	120.00	0.04	0	0	0	PVC
988	P-613	J-478	J-479	100.00	200	120.00	-0.02	0	0	0	PVC
989	P-614	J-479	J-480	106.00	200	120.00	-1.63	0.05	0.003	0.026	PVC
990	P-615	J-478	Country Squire	134.00	200	120.00	0.01	0	0	0	PVC
991	P-616	Country Squire	J-482	51.00	200	120.00	0.00	0	0	0	PVC
992	P-617	J-483	J-88	77.00	200	120.00	0.00	0	0	0	PVC
993	P-618	J-255	J-484	74.00	300	120.00	-1.33	0.02	0	0.002	PVC
994	P-619	J-484	J-485	90.00	300	120.00	-1.40	0.02	0	0.003	PVC
995	P-620	J-485	Greenbriar	149.00	300	120.00	-1.43	0.02	0	0.002	PVC
996	P-621	Greenbriar	J-487	95.00	300	120.00	-1.55	0.02	0.001	0.004	PVC
997	P-622	J-487	J-488	146.00	300	120.00	-1.59	0.02	0	0.003	PVC
998	P-623	J-488	J-489	137.00	300	120.00	-1.59	0.02	0.001	0.003	PVC
999	P-624	J-489	J-490	161.00	300	120.00	2.60	0.04	0.001	0.009	PVC
1000	P-625	J-490	J-491	59.00	300	120.00	2.13	0.03	0.001	0.006	PVC
1001	P-626	J-472	J-492	200.00	300	120.00	5.68	0.08	0.007	0.037	PVC
1003	P-628	J-493	J-494	221.00	300	120.00	12.30	0.17	0.041	0.154	PVC
1004	P-631	J-496	J-701	290.00	300	120.00	6.56	0.09	0.007	0.048	PVC
1006	P-633	J-494	J-496	395.00	300	120.00	12.30	0.17	0.027	0.154	PVC
1007	P-634	J-256	J-499	159.00	200	120.00	0.09	0	0	0	HDPE
1008	P-635	J-125	J-500	208.00	200	120.00	1.11	0.04	0.003	0.013	PVC
1009	P-636	J-500	J-193	123.00	200	120.00	1.03	0.03	0.001	0.012	PVC
1012	P-639	J-75	J-502	104.00	200	120.00	-3.47	0.11	0.011	0.106	PVC
1013	P-640	J-502	J-503	95.00	200	120.00	-3.53	0.11	0.01	0.11	PVC
1014	P-641	J-503	J-504	118.00	200	120.00	-3.61	0.11	0.013	0.114	PVC
1015	P-642	J-504	J-505	103.00	200	120.00	-3.69	0.12	0.012	0.119	PVC
1016	P-643	J-75	J-506	84.00	200	120.00	0.17	0.01	0	0.001	PVC
1017	P-644	J-506	J-507	147.00	200	120.00	0.10	0	0	0	PVC
1018	P-533	J-426	J-433	198.00	200	110.00	0.87	0.03	0.002	0.01	Asbestos Cement
1021	P-439	J-513	J-167	152.00	300	120.00	-39.98	0.57	0.167	1.364	HDPE
1023	P-441	J-148	J-338	252.00	200	120.00	0.89	0.03	0.002	0.008	PVC
1024	P-443	J-339	J-232	126.00	200	120.00	1.85	0.06	0.004	0.033	PVC
1025	P-445	J-340	J-341	74.00	200	120.00	0.08	0	0	0	PVC
1026	P-446	J-338	J-342	79.00	200	120.00	0.82	0.03	0.001	0.008	PVC
1027	P-447	J-342	J-340	138.00	200	120.00	0.33	0.01	0	0.002	PVC
1028	P-448	J-342	J-343	127.00	200	120.00	0.49	0.02	0	0.003	PVC
1029	P-449	J-343	J-344	109.00	200	120.00	0.09	0	0	0	PVC
1030	P-450	J-344	J-345	88.00	200	120.00	0.09	0	0	0	PVC
1031	P-451	J-345	J-346	107.00	200	120.00	-1.36	0.04	0.002	0.018	PVC
1032	P-452	J-255	J-347	531.00	300	120.00	2.49	0.04	0.004	0.008	HDPE
1034	P-454	J-347	J-348	255.00	200	120.00	0.99	0.03	0.002	0.011	PVC
1036	P-456	J-349	J-350	241.00	250	120.00	0.64	0.01	0	0.001	PVC
1037	P-457	J-350	J-351	254.00	250	120.00	-0.94	0.02	0.001	0.003	PVC
1038	P-458	J-351	J-352	307.00	250	120.00	-2.13	0.04	0.004	0.015	PVC
1039	P-459	J-352	J-353	190.00	250	120.00	-2.13	0.04	0.002	0.014	PVC
1040	P-460	J-353	J-491	195.00	250	120.00	-2.13	0.04	0.003	0.015	PVC
1042	P-462	J-354	J-355	173.00	300	120.00	13.00	0.18	0.029	0.171	PVC
1052	P-486	J-252	J-367	354.00	300	120.00	0.26	0	0	0	PVC
1057	P-499	J-511	J-372	586.00	250	120.00	-13.75	0.28	0.079	0.46	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1058	P-504	J-176	J-373	101.00	200	120.00	-2.08	0.07	0.004	0.041	PVC
1059	P-505	J-373	J-374	144.00	200	120.00	-2.08	0.07	0.006	0.041	PVC
1060	P-506	J-374	J-375	147.00	200	120.00	-2.32	0.07	0.007	0.051	PVC
1061	P-507	J-375	J-164	158.00	200	120.00	-2.32	0.07	0.008	0.051	PVC
1062	P-508	J-165	J-376	357.00	200	120.00	12.99	0.41	0.415	1.226	PVC
1063	P-510	J-377	J-378	401.00	200	120.00	1.85	0.06	0.014	0.033	PVC
1064	P-512	J-379	J-380	394.00	200	120.00	-1.19	0.04	0.006	0.015	PVC
1065	P-513	J-380	J-460	90.00	300	120.00	-1.19	0.02	0	0.002	PVC
1066	P-514	J-91	J-381	67.00	200	120.00	-6.65	0.21	0.022	0.354	PVC
1067	P-515	J-381	J-382	353.00	200	120.00	-6.65	0.21	0.122	0.355	PVC
1069	P-517	J-473	J-104	80.00	200	120.00	1.20	0.04	0.001	0.015	PVC
1073	P-524	J-384	J-385	986.00	350	120.00	-20.39	0.21	0.142	0.185	PVC
1075	P-527	J-387	J-280	912.00	350	120.00	-103.78	1.08	3.413	3.768	PVC
1077	P-530	J-389	J-669	661.00	250	120.00	-10.99	0.22	0.133	0.303	PVC
1087	P-548	J-400	Supreme Steel	629.00	300	120.00	-25.67	0.36	0.273	0.6	PVC
1103	P-573	J-424	J-425	398.00	300	120.00	27.98	0.4	0.181	0.705	PVC
1107	P-577	J-206	J-224	304.00	322	120.00	11.02	0.14	0.028	0.089	HDPE
1108	P-580	J-173	J-429	273.00	200	120.00	1.26	0.04	0.004	0.016	PVC
1109	P-581	J-429	J-160	203.00	200	120.00	0.72	0.02	0.001	0.006	PVC
1110	P-582	J-153	J-430	277.00	200	120.00	-0.16	0.01	0	0.001	PVC
1111	P-583	J-430	J-480	334.00	200	120.00	-0.84	0.03	0.003	0.008	PVC
1112	P-584	J-480	J-431	297.00	200	120.00	-2.52	0.08	0.022	0.059	PVC
1113	P-585	J-431	J-170	268.00	200	120.00	-2.56	0.08	0.011	0.061	PVC
1116	P-588	J-435	J-436	431.00	200	120.00	0.54	0.02	0.001	0.003	PVC
1117	P-589	J-436	J-455	232.00	200	120.00	0.54	0.02	0.001	0.003	PVC
1118	P-590	J-340	J-437	148.00	200	120.00	-0.05	0	0	0	PVC
1119	P-591	J-437	J-339	102.00	200	120.00	1.97	0.06	0.004	0.037	PVC
1120	P-593	J-438	J-147	134.00	300	120.00	-2.28	0.03	0.001	0.007	PVC
1124	P-630	J-505	J-82	489.00	200	120.00	-3.82	0.12	0.062	0.127	PVC
1137	P-664	J-385	PRV-16	32.00	350	120.00	-29.59	0.31	0.084	0.369	PVC
1138	P-665	PRV-16	J-386	969.00	350	120.00	-29.59	0.31	0.315	0.369	PVC
1140	P-671	J-379	J-93	481.00	200	120.00	-0.62	0.02	0.002	0.004	PVC
1143	P-678	J-511	J-510	93.00	250	120.00	9.28	0.19	0.076	0.222	PVC
1149	P-684	J-509	J-444	384.00	300	120.00	12.55	0.18	0.071	0.16	PVC
1150	P-685	J-444	J-403	378.00	300	120.00	31.82	0.45	0.442	0.894	PVC
1153	P-688	J-401	J-623	837.00	300	120.00	-10.31	0.15	0.078	0.111	PVC
1158	P-693	J-169	J-388	745.00	300	120.00	-13.68	0.19	0.091	0.187	PVC
1169	P-705	J-449	J-208	166.00	300	120.00	-10.22	0.14	0.015	0.109	PVC
1171	P-707	Supreme Steel	J-450	178.00	410	120.00	-68.48	0.52	0.174	0.807	HDPE
1172	P-708	J-450	J-1	334.00	400	120.00	-68.48	0.54	0.306	0.911	PVC
1174	P-710	J-343	J-452	68.00	200	120.00	0.21	0.01	0	0.001	PVC
1175	P-711	J-437	J-453	67.00	200	120.00	-2.02	0.06	0.003	0.04	PVC
1176	P-712	J-453	J-438	139.00	300	120.00	-2.21	0.03	0.001	0.006	PVC
1180	P-717	J-399	J-463	398.00	300	120.00	-23.77	0.34	0.208	0.521	PVC
1181	P-718	J-463	J-400	489.00	300	120.00	-18.08	0.26	0.19	0.314	PVC
1185	P-722	J-607	J-463	437.00	300	120.00	11.25	0.16	0.057	0.13	PVC
1186	P-723	J-418	J-495	222.00	600	120.00	37.70	0.13	0.012	0.042	PVC
1190	P-727	J-514	J-417	673.00	300	120.00	3.15	0.04	0.005	0.012	PVC
1191	P-728	J-402	J-509	260.00	300	120.00	17.06	0.24	0.183	0.282	PVC
1192	P-729	J-509	J-412	472.00	400	120.00	-2.90	0.02	0.001	0.003	PVC
1193	P-730	R-4	PRV-18	2.00	300	120.00	147.11	2.08	0.03	15.218	PVC
1194	P-731	PRV-18	J-454	2.00	300	120.00	147.11	2.08	0.03	15.218	PVC
1203	P-735	J-449	J-515	810.00	250	120.00	3.97	0.08	0.015	0.046	PVC
1206	P-737	J-425	J-516	666.00	300	120.00	27.98	0.4	0.123	0.705	PVC
1211	P-740	J-424	J-518	0.00	300	120.00	0.00	0	0	0	PVC
1213	P-741	J-390	J-519	897.00	400	120.00	1.03	0.01	0	0	PVC
1216	P-743	J-373	J-520	0.00	200	120.00	0.00	0	0	0	PVC
1218	P-744	J-348	J-521	448.00	200	120.00	0.73	0.02	0.001	0.006	PVC
1219	P-745	J-521	J-349	448.00	200	120.00	0.73	0.02	0.001	0.006	PVC
1222	P-746	J-521	J-523	0	200	120	0	0	0	0	PVC
1224	P-747	J-349	J-524	0	250	120	0	0	0	0	PVC
1226	P-748	J-351	J-525	0	200	120	0	0	0	0	PVC
1248	P-754	J-495	J-529	560	600	120	19.28	0.07	0.001	0.012	PVC
1251	P-756	J-529	J-530	0	600	120	18.74	0.07	0.001	0.011	PVC
1253	P-757	J-530	J-531	0	600	120	18.74	0.07	0.002	0.012	PVC
1255	P-758	J-531	J-532	0	600	120	17.6	0.06	0.001	0.01	PVC
1256	P-759	J-532	J-390	0	600	120	17.6	0.06	0.002	0.01	PVC
1257	P-760	J-390	J-495	0	600	120	-18.42	0.07	0.007	0.011	PVC
1262	P-762	PRV-A	J-535	185	300	120	25.2	0.36	0.041	0.58	PVC
1263	P-763	J-535	Panattoni	185	300	120	12.2	0.17	0.028	0.152	PVC
1269	P-767	J-536	J-537	0	300	120	-36.05	0.51	0.43	1.126	PVC
1273	P-769	J-537	J-539	0	300	120	4.94	0.07	0.009	0.028	PVC
1275	P-770	J-536	J-540	0	300	120	0	0	0	0	PVC
1277	P-771	J-541	J-536	0	300	120	-11.93	0.17	0.025	0.145	PVC
1280	P-773	J-542	PRV-A	0	300	120	25.2	0.36	0.057	0.58	PVC
1287	P-778	J-547	J-541	0	300	120	-11.93	0.17	0.081	0.145	PVC
1290	P-779	J-537	J-546	0	300	120	-41.22	0.58	0.485	1.444	PVC
1294	P-782	J-536	J-547	0	300	120	16.68	0.24	0.106	0.27	PVC
1295	P-783	J-547	J-542	0	350	120	28.6	0.3	0.132	0.346	PVC
1304	P-789	J-1	J-550	0	350	120	-99.9	1.04	0.766	3.511	PVC
1309	P-792	J-82	J-552	0	200	120	0.56	0.02	0	0.004	PVC
1311	P-793	J-345	J-553	288	200	120	1.32	0.04	0.002	0.018	PVC
1312	P-794	J-553	J-435	288	200	120	1.32	0.04	0.003	0.018	PVC
1314	P-795	J-197	J-554	247	300	120	0.23	0	0	0	PVC
1315	P-796	J-554	J-200	247	300	120	0.54	0.01	0	0.001	PVC
1316	P-797	J-261	J-554	0	200	120	0.32	0.01	0.001	0.001	PVC
1318	P-798	J-261	J-555	401	300	120	1.38	0.02	0	0.003	PVC
1319	P-799	J-555	J-196	401	300	120	1.05	0.01	0	0.002	PVC
1324	P-801	J-555	J-558	0	200	120	0	0	0	0	PVC
1325	P-802	J-558	J-556	0	200	120	0	0	0	0	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1326	P-803	J-557	J-558	0	200	120	0	0	0	0	PVC
1331	P-806	J-168	J-560	1,219	350	120	-8.43	0.09	0.02	0.036	PVC
1334	P-808	J-246	J-561	359	322	120	-53.16	0.65	0.3	1.638	HDPE
1335	P-809	J-561	J-278	359	300	120	-53.16	0.75	0.397	2.312	PVC
1337	P-810	J-277	J-562	362	300	120	9.39	0.13	0.022	0.093	PVC
1338	P-811	J-562	J-451	362	300	120	9.35	0.13	0.014	0.092	PVC
1340	P-812	J-451	J-563	0	300	120	9.11	0.13	0.027	0.088	PVC
1343	P-814	J-563	J-564	0	300	120	8.31	0.12	0.025	0.074	PVC
1344	P-815	J-564	J-167	0	300	120	8.31	0.12	0.014	0.075	PVC
1346	P-816	J-275	J-565	618	300	120	3.29	0.05	0.003	0.013	PVC
1347	P-817	J-565	J-180 (Dummy)	618	300	120	8.06	0.11	0.027	0.07	PVC
1349	P-818	J-275	J-566	785	300	120	-1.72	0.02	0.001	0.004	PVC
1350	P-819	J-614	J-388	785	300	120	-8.12	0.11	0.045	0.071	PVC
1352	P-820	J-566	J-567	0	300	120	0.04	0	0	0	PVC
1354	P-821	J-262	J-568	797	300	120	-5.19	0.07	0.015	0.031	PVC
1355	P-822	J-568	J-449	797	300	120	-5.62	0.08	0.014	0.036	PVC
1357	P-823	Panattoni	J-569	726	300	120	11.78	0.17	0.012	0.142	PVC
1361	P-826	J-570	J-464	726	300	120	11.78	0.17	0.032	0.142	PVC
1364	P-828	J-571	J-570	726	300	120	11.78	0.17	0.014	0.142	PVC
1368	P-830	J-573	Supreme Steel	1,001	400	120	-42.81	0.34	0.066	0.381	PVC
1374	P-834	J-575	J-369	589	300	120	-13.54	0.19	0.027	0.183	PVC
1376	P-835	J-424	J-576	899	400	120	6.49	0.05	0.003	0.011	PVC
1386	P-837	J-454	J-577	0	300	120	45.45	0.64	0.15	1.73	PVC
1388	P-838	J-569	J-578	726	300	120	11.78	0.17	0.037	0.142	PVC
1389	P-839	J-578	J-571	726	300	120	11.78	0.17	0.01	0.142	PVC
1391	P-840	J-497	J-579	41	300	120	3.34	0.05	0.002	0.014	PVC
1392	P-841	J-579	J-498	41	300	120	0	0	0	0	PVC
1396	P-842	J-579	J-582	959	300	120	3.34	0.05	0.002	0.014	PVC
1402	P-845	J-403	J-585	783	300	120	31.82	0.45	0.288	0.894	PVC
1403	P-846	J-585	J-622	783	300	120	16.54	0.23	0.107	0.266	PVC
1406	P-848	J-576	J-586	899	400	120	5.14	0.04	0.002	0.008	PVC
1411	P-851	J-280	J-588	1,451	400	120	65.31	0.52	0.407	0.834	PVC
1423	P-855	J-422	J-590	905	400	120	11.82	0.09	0.013	0.035	PVC
1426	P-857	PRV-15	J-591	974	350	120	-39.18	0.41	0.208	0.62	PVC
1427	P-858	J-591	J-387	974	350	120	-42.79	0.44	0.398	0.73	PVC
1430	P-860	J-592	J-577	0	300	120	-45.45	0.64	0.308	1.73	PVC
1450	P-871	J-371	J-601	444	300	120	0.61	0.01	0	0	PVC
1451	P-872	J-601	J-350	444	300	120	-1.58	0.02	0.001	0.003	PVC
1453	P-873	J-347	J-602	818	300	120	1.5	0.02	0.002	0.003	HDPE
1454	P-874	J-602	J-252	818	300	120	1.5	0.02	0.001	0.003	HDPE
1460	P-878	J-489	J-604	428	300	120	-4.22	0.06	0.005	0.021	PVC
1461	P-879	J-604	J-215	428	300	120	-6.43	0.09	0.01	0.046	PVC
1474	P-884	J-481	J-607	0	300	120	11.25	0.16	0.048	0.13	PVC
1476	P-885	J-508	J-608	503	300	120	-27.26	0.39	0.104	0.671	PVC
1479	P-887	J-608	J-609	0	300	120	0	0	0	0	PVC
1481	P-888	J-391 (Dummy)	J-610	624	400	120	-0.35	0	0	0	PVC
1482	P-889	J-610	J-508	624	300	120	-3.89	0.05	0.004	0.018	PVC
1484	P-890	J-415	J-611	176	300	120	17.39	0.25	0.032	0.292	PVC
1485	P-891	J-611	J-9	176	300	120	17.39	0.25	0.006	0.294	PVC
1501	P-901	J-613	J-384	1,219	350	120	-17.39	0.18	0.051	0.138	PVC
1505	P-904	J-565	J-614	0	300	120	-4.77	0.07	0.005	0.027	PVC
1506	P-905	J-614	J-566	0	300	120	1.78	0.03	0.001	0.004	PVC
1528	P-914	J-619	J-671	1,187	350	120	-34.69	0.36	0.221	0.495	PVC
1530	P-915	J-584	J-620	0	300	120	-15.27	0.22	0.047	0.23	PVC
1531	P-916	J-620	J-585	0	300	120	-15.27	0.22	0.147	0.23	PVC
1544	P-924	J-622	J-404	754	300	120	16.54	0.23	0.075	0.266	PVC
1547	P-926	J-623	J-399	789	300	120	-10.31	0.15	0.045	0.111	PVC
1549	P-927	J-610	J-439	356	300	120	2.96	0.04	0.006	0.011	PVC
1553	P-929	J-412	J-626	720	400	120	-9.19	0.07	0.011	0.022	PVC
1554	P-930	J-626	J-422	720	400	120	11.82	0.09	0.006	0.035	PVC
1558	P-932	J-634	J-401	1,163	300	120	2.82	0.04	0.006	0.01	PVC
1560	P-933	J-508	J-629	1,206	400	120	36.59	0.29	0.124	0.285	PVC
1561	P-934	J-629	J-628	1,206	400	120	36.59	0.29	0.103	0.285	PVC
1564	P-935	J-395	J-631	803	350	120	-5.77	0.06	0.009	0.018	PVC
1565	P-936	J-631	J-396	803	300	120	11.1	0.16	0.05	0.127	PVC
1574	P-941	J-354	J-535	0	300	120	-13	0.18	0.063	0.17	PVC
1580	P-944	J-439	J-624	0	300	120	-2.18	0.03	0.003	0.006	PVC
1605	P-946	J-493	J-632	0	300	120	-13	0.18	0.014	0.171	PVC
1606	P-947	J-632	J-355	0	300	120	-13	0.18	0.09	0.17	PVC
1613	P-949	J-382	PRV-24	465	200	120	-10.82	0.34	0.32	0.873	PVC
1614	P-950	PRV-24	J-377	465	200	120	-10.82	0.34	0.11	0.873	PVC
1615	P-951	J-376	J-377	0	200	120	12.67	0.4	0.396	1.171	PVC
1617	P-952	J-378	PRV-25	279	200	120	0	0	0	0	PVC
1618	P-953	PRV-25	J-379	279	200	120	0	0	0	0	PVC
1620	P-954	J-628	J-634	906	400	120	36.59	0.29	0.047	0.285	PVC
1625	P-958	J-635	J-444	1,451	300	120	28.99	0.41	0.342	0.753	PVC
1626	P-959	J-402	J-635	0	300	120	-17.06	0.24	0.088	0.282	PVC
1682	P-967	J-516	J-642	666	400	120	27.98	0.22	0.017	0.174	PVC
1683	P-968	J-642	J-393	666	400	120	27.98	0.22	0.012	0.174	PVC
1712	P-971	J-382	J-644	0	200	120	2.32	0.07	0.015	0.05	PVC
1743	P-540(2)	J-647	J-393	848	400	120	6.65	0.05	0.005	0.012	PVC
1745	P-974	J-647	J-648 (Dummy)	0	300	120	3.58	0.05	0.006	0.016	PVC
1747	P-975	J-648 (Dummy)	J-649	0	300	120	1.54	0.02	0.001	0.003	PVC
1749	P-540(1)(1)	J-392	J-650	848	400	120	15.5	0.12	0.017	0.058	PVC
1750	P-540(1)(2)	J-650	J-647	848	400	120	10.24	0.08	0.004	0.027	PVC
1751	P-976	J-649	J-650	0	300	120	-5.26	0.07	0.01	0.032	PVC
1794	P-691(1)	J-166	J-651	105	350	120	-39.98	0.42	0.068	0.644	PVC
1795	P-691(2)	J-651	PRV-2i	1	76	120	-39.98	8.81	1.095	1,095.30	PVC
1797	P-438(1)	PRV-2i	J-652	1	76	120	-39.98	8.81	1.095	1,095.30	PVC
1798	P-438(2)	J-652	J-513	118	350	120	-39.98	0.42	0.076	0.644	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1807	P-531(1)	J-207	J-653	39	300	120	-25.81	0.37	0.024	0.607	PVC
1808	P-531(2)	J-653	PRV-Bi	1	100	120	-25.81	3.29	0.128	127.918	PVC
1810	P-532(1)	PRV-Bi	J-654	1	100	120	-25.81	3.29	0.128	127.918	PVC
1811	P-532(2)	J-654	J-210	144	300	120	-25.81	0.37	0.087	0.606	PVC
1816	P-246(1)	J-190	J-655	43	300	120	0	0	0	0	PVC
1817	P-246(2)	J-655	PRV-1i	1	76	120	0	0	0	0	PVC
1819	P-247(1)	PRV-1i	J-656	1	76	120	0	0	0	0	PVC
1820	P-247(2)	J-656	J-191	166	265	120	0	0	0	0	HDPE
1825	P-605(1)	J-456	J-657	123	200	120	-3.21	0.1	0.011	0.092	PVC
1826	P-605(2)	J-657	PRV-21i	1	76	120	-3.21	0.71	0.01	10.269	PVC
1828	P-606(1)	PRV-21i	J-658	1	76	120	-3.21	0.71	0.01	10.269	PVC
1829	P-606(2)	J-658	J-140	37	200	120	-3.21	0.1	0.003	0.092	PVC
1834	P-131(1)	J-124	J-659	15	200	120	-1.43	0.05	0	0.02	PVC
1835	P-131(2)	J-659	PRV-3i	1	50	120	-1.43	0.73	0.018	17.562	PVC
1837	P-132(1)	PRV-3i	J-660	1	50	120	-1.43	0.73	0.017	17.487	PVC
1838	P-132(2)	J-660	J-126	64	200	120	-1.43	0.05	0.001	0.021	PVC
1858	P-989	J-83	J-662	0	200	120	0.12	0	0	0.001	PVC
1860	P-990	J-85	J-663	0	200	120	0.15	0	0	0	PVC
1861	P-991	J-277	J-181	0	300	120	-3.37	0.05	0.004	0.014	PVC
1883	P-854(1)	J-589	J-666	120	250	120	-15.35	0.31	0.068	0.563	PVC
1884	P-854(2)	J-666	PRV-19i	1	76.2	120	-15.35	3.37	0.184	183.654	PVC
1886	P-680(1)	PRV-19i	J-667	1	76.2	120	-15.35	3.37	0.184	183.654	PVC
1887	P-680(2)	J-667	J-165	61	300	120	-15.35	0.22	0.014	0.232	PVC
1931	P-790(1)	J-550	J-668	0	350	120	-100.66	1.05	0.738	3.561	PVC
1932	P-790(2)	J-668	J-454	0	350	120	-101.41	1.05	0.546	3.61	PVC
1934	P-662(1)	J-388	J-669	44	300	120	-22.79	0.32	0.059	0.482	PVC
1935	P-662(2)	J-669	PRV-15	44	350	120	-39.18	0.41	0.133	0.62	PVC
1937	P-995	J-169	J-670	0	250	120	-0.13	0	0	0	PVC
1939	P-844(1)	J-387	J-671	0	350	120	23.01	0.24	0.114	0.231	PVC
1940	P-844(2)	J-671	J-584	0	350	120	-17.63	0.18	0.052	0.141	PVC
1942	P-913(1)	J-386	J-672	1,187	350	120	-42.03	0.44	0.288	0.706	PVC
1945	P-955(1)	J-634	J-673	906	350	120	16.39	0.17	0.027	0.123	PVC
1948	P-996	J-674	J-672	0	350	120	19.63	0.2	0.062	0.173	PVC
1950	P-831(1)	J-481	J-675	1,001	400	120	-39.32	0.31	0.077	0.326	PVC
1951	P-831(2)	J-675	J-574	1,001	400	120	-40.83	0.32	0.074	0.349	PVC
1953	P-886(1)	J-608	J-676	503	400	120	-27.26	0.22	0.026	0.166	PVC
1954	P-886(2)	J-676	J-481	503	400	120	-27.72	0.22	0.025	0.17	PVC
1960	P-955(2)(1)	J-673	J-681	906	350	120	15.39	0.16	0.045	0.11	PVC
1961	P-955(2)(2)	J-681	J-631	906	350	120	17.98	0.19	0.056	0.147	PVC
1962	P-997	J-678	J-677	0	300	120	-2.59	0.04	0.003	0.008	PVC
1963	P-998	J-678	J-679	0	300	120	2.59	0.04	0.001	0.009	PVC
1964	P-999	J-681	J-679	0	350	120	-2.59	0.03	0.002	0.004	PVC
1966	P-490(1)	J-253	J-682	280	200	120	1.18	0.04	0.002	0.014	PVC
1967	P-490(2)	J-682	J-371	280	200	120	0.61	0.02	0.001	0.005	PVC
1973	P-1000	J-683	J-474	0	300	120	-2.89	0.04	0.001	0.011	PVC
1975	P-627(1)	J-492	J-685	233	300	120	5.63	0.08	0.006	0.036	PVC
1976	P-627(2)	J-685	J-493	233	300	120	2.27	0.03	0.001	0.007	PVC
1978	P-734(2)(1)	J-684	J-686	669	300	120	-1.28	0.02	0.001	0.002	PVC
1979	P-734(2)(2)	J-686	J-493	669	300	120	-2.97	0.04	0.002	0.011	PVC
1981	P-833(1)	J-508	J-687	589	300	120	-13.21	0.19	0.04	0.175	PVC
1982	P-833(2)	J-687	J-575	589	300	120	-13.54	0.19	0.036	0.184	PVC
1984	P-725(1)	J-9	J-688	642	300	120	3.74	0.05	0.004	0.017	PVC
1985	P-725(2)	J-688	J-514	642	300	120	3.28	0.05	0.006	0.013	PVC
1987	P-849(1)	J-586	J-689	899	400	120	5.07	0.04	0.001	0.007	PVC
1988	P-849(2)	J-689	J-391 (Dummy)	899	400	120	3.87	0.03	0.001	0.004	PVC
1990	P-428(1)	J-81	J-690	1,571	250	120	-8.17	0.17	0.045	0.175	PVC
1991	P-428(2)	J-690	J-510	1,571	250	120	-9.28	0.19	0.068	0.222	PVC
1993	P-853(1)	J-372	J-691	581	250	120	-13.75	0.28	0.106	0.46	PVC
1994	P-853(2)	J-691	J-589	581	250	120	-15.35	0.31	0.113	0.563	PVC
1996	P-286(1)	J-256	J-692	219	200	120	-0.18	0.01	0	0.001	HDPE
1997	P-286(2)	J-692	J-257	219	200	120	-0.75	0.02	0.001	0.006	HDPE
1999	P-76(1)	J-71	J-693	166	200	120	0.17	0.01	0	0	PVC
2000	P-76(2)	J-693	J-72	166	200	120	0.09	0	0	0.001	PVC
2003	P-988(2)	J-694	J-200	0	200	120	1.08	0.03	0.003	0.012	PVC
2005	P-988(1)(1)	J-515	J-695	0	200	120	3.83	0.12	0.02	0.128	PVC
2006	P-988(1)(2)	J-695	J-694	0	200	120	2.33	0.07	0.01	0.051	PVC
2010	P-956(1)	J-392	J-697	0	400	120	-15.53	0.12	0.013	0.058	PVC
2011	P-956(2)	J-697	J-634	0	400	120	-17.37	0.14	0.016	0.072	PVC
2013	P-832(1)	J-574	J-698	1,001	400	120	-42.33	0.34	0.114	0.374	PVC
2014	P-832(2)	J-698	J-573	1,001	400	120	-42.66	0.34	0.026	0.379	PVC
2016	P-571(1)	J-390	J-699	201	400	120	34.73	0.28	0.054	0.259	PVC
2017	P-571(2)	J-699	J-424	201	400	120	34.55	0.27	0.042	0.256	PVC
2021	P-518(1)	J-346	J-700	347	300	120	-1.36	0.02	0.001	0.003	PVC
2022	P-518(2)	J-700	J-479	347	300	120	-1.61	0.02	0.001	0.003	PVC
2026	P-948(2)	J-701	J-497	0	300	120	3.87	0.05	0.003	0.018	PVC
2028	P-957(1)	J-588	J-702	1,451	400	120	64.11	0.51	0.106	0.806	PVC
2029	P-957(2)	J-702	J-635	1,451	300	120	58.21	0.82	1.696	2.736	PVC
2031	P-1002	J-382	J-703	0	200	120	1.84	0.06	0.007	0.033	PVC
2049	P-900(1)	J-560	J-709	1,219	350	120	-8.79	0.09	0.006	0.039	PVC
2050	P-900(2)	J-709	J-613	1,219	350	120	-8.79	0.09	0.005	0.039	PVC
2056	P-1007	J-670	J-389	0	250	120	-2.94	0.06	0.016	0.026	PVC
2057	P-1008	J-624	J-391 (Dummy)	0	300	120	-2.18	0.03	0.003	0.006	PVC
2058	P-1009	J-677	J-649	0	300	120	-6.8	0.1	0.011	0.051	PVC
2060	P-1011	J-546	J-360	0	300	120	-43.74	0.62	0.618	1.611	PVC
2065	P-913(2)(1)	J-672	J-713	1,187	350	120	-28.48	0.3	0.113	0.344	PVC
2066	P-913(2)(2)	J-713	J-619	1,187	350	120	-28.48	0.3	0.144	0.344	PVC
2067	P-1014	J-404	J-715	0	300	120	3.65	0.05	0.008	0.016	PVC
2072	P-1016(1)	J-584	J-715	0	300	120	-2.36	0.03	0.004	0.007	PVC
2073	P-1016(2)	J-715	J-696	0	300	120	1.29	0.02	0.003	0.002	PVC
2094	P-1018	J-387	J-718	0	350	120	37.97	0.39	0.385	0.585	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
2095	P-1019	J-718	J-591	0	350	120	6.75	0.07	0.013	0.024	PVC
2096	P-1020	J-718	J-674	0	350	120	31.22	0.32	0.145	0.407	PVC
2109	P-1023	R-5	PRV-5	2	400	120	224.91	1.79	0.016	8.223	PVC
2129	P-1026	J-592	J-360	0	300	120	43.74	0.62	0.551	1.612	PVC
2144	P-687(2)	J-719	J-626	807	400	120	21.02	0.17	0.033	0.102	PVC
2146	P-687(1)(1)	J-393	J-720	807	400	120	21.02	0.17	0.024	0.102	PVC
2147	P-687(1)(2)	J-720	J-719	807	400	120	21.02	0.17	0.022	0.102	PVC
2149	P-1029	J-111	J-721	0	200	120	0	0	0	0	PVC
2150	P-1030	J-168	J-167	0	350	120	18.83	0.2	0.066	0.16	PVC
2154	P-1032	J-555	J-723	0	300	120	0.33	0	0	0	PVC
2156	P-1033	J-723	J-724	0	300	120	0.33	0	0	0.001	PVC
2158	P-1034	J-724	J-725	0	300	120	0.33	0	0	0	PVC
2159	P-1035	J-725	J-192	0	300	120	0.33	0	0	0	PVC

AECOM

Appendix G

Ultimate System Simulation Results

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
185	J-160	584,027.01	5,934,838.88	678.02	0	79.30	733.85
186	J-222	582,145.56	5,932,813.74	700.26	0	63.40	744.95
187	J-162	583,810.38	5,934,670.57	685.00	0	69.30	733.85
188	J-138	584,613.67	5,935,181.42	678.38	0	78.70	733.85
189	J-192	581,191.96	5,933,912.97	677.56	0	95.60	744.91
190	J-119	584,936.53	5,935,869.14	667.10	0	73.70	719.01
191	J-134	584,764.89	5,935,072.26	680.51	0.04	75.70	733.85
192	J-67	581,650.04	5,931,561.40	710.00	0	78.10	765.05
193	J-38	581,243.76	5,931,279.09	710.00	0.04	77.20	764.40
194	J-41	581,141.03	5,931,480.63	710.00	0.04	77.20	764.40
195	J-144	584,396.66	5,935,219.39	675.00	0	83.50	733.85
196	J-37	581,243.76	5,931,168.95	710.00	0	77.20	764.37
197	J-472	580,740.47	5,933,183.14	689.91	0	78.10	744.93
198	J-201	581,815.00	5,933,229.15	690.13	0	77.80	744.95
199	J-91	582,694.12	5,935,128.13	660.00	0	79.80	716.19
200	J-103	585,091.20	5,936,277.99	665.00	0.04	76.70	719.01
201	J-53	581,438.28	5,930,980.15	710.00	0.12	77.40	764.50
202	J-40	581,233.98	5,931,482.32	710.00	0	77.30	764.46
203	J-107	584,778.23	5,935,996.97	664.16	0	77.90	719.01
204	J-212	581,825.45	5,932,053.99	710.00	0	79.30	765.86
205	J-197	581,603.91	5,933,472.82	685.44	0	84.40	744.93
206	J-159	584,150.38	5,934,848.85	679.15	0	77.60	733.85
207	J-163	583,696.80	5,934,580.94	685.00	0	69.30	733.85
208	J-92	582,355.13	5,935,027.71	660.00	0.03	79.70	716.18
209	J-90	582,616.55	5,935,084.61	660.00	0.07	79.80	716.18
210	J-111	585,098.38	5,935,794.30	672.05	0.07	66.70	719.01
211	J-177	583,865.02	5,934,178.46	693.29	0	57.60	733.85
212	J-471	580,745.35	5,933,130.74	690.00	0	78.00	744.93
213	J-233	584,681.75	5,934,979.21	681.75	0.06	74.00	733.85
214	68 (Dum	580,952.95	5,932,747.92	698.59	2.73	65.80	744.94
215	J-1	579,511.27	5,931,168.86	705.00	0.72	83.60	763.88
216	J-174	583,865.88	5,934,330.48	690.60	0.06	61.40	733.85
218	J-131	584,433.28	5,934,995.60	679.54	0.06	77.10	733.85
219	J-100	584,835.40	5,936,162.83	665.00	0.07	76.70	719.01
220	J-75	581,067.83	5,934,963.64	655.66	0	85.90	716.17
221	J-60	581,268.02	5,931,483.28	710.00	0	77.40	764.49
222	J-217	581,836.74	5,931,627.98	710.00	0	79.00	765.63
223	J-146	584,443.42	5,934,865.47	686.39	0	67.40	733.85
224	J-6	579,945.01	5,931,013.88	708.42	0.04	79.00	764.06
225	J-169	583,532.49	5,933,358.14	700.00	0	63.80	744.96
226	J-4	579,847.42	5,931,278.15	705.69	0	82.70	763.95
227	J-27	580,669.54	5,930,951.45	710.00	0.12	76.90	764.19
228	J-158	584,415.79	5,934,856.33	685.70	0	68.30	733.85
229	J-14	580,335.90	5,931,383.96	710.00	0	76.70	764.02
230	J-105	584,480.67	5,935,747.97	663.83	0.07	78.30	719.02
231	J-261	581,205.35	5,933,531.77	685.10	0	84.90	744.92
232	J-51	581,311.65	5,930,974.43	710.00	0.24	77.20	764.38
233	J-183	582,114.01	5,933,238.15	690.57	0	77.20	744.95

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
234	J-106	584,742.82	5,936,007.34	663.04	0.04	79.50	719.01
235	J-244	581,247.28	5,930,944.87	712.82	0	73.10	764.31
236	J-185	582,109.89	5,933,372.58	689.49	0.48	78.70	744.95
237	J-205	581,855.89	5,932,883.46	697.62	0	67.20	744.95
238	J-88	582,477.45	5,934,962.82	661.52	0.07	77.60	716.18
239	J-87	582,416.94	5,934,900.96	661.92	0	77.00	716.18
240	J-104	584,294.78	5,935,708.60	663.84	0.07	78.30	719.02
241	J-246	581,897.49	5,931,628.85	710.00	0	79.40	765.94
242	J-232	584,892.94	5,934,920.80	684.28	0	70.40	733.85
243	J-30	580,902.68	5,930,954.31	710.00	0.08	77.00	764.26
244	J-9	580,323.88	5,930,706.90	710.00	0.04	76.80	764.11
245	J-182	582,375.00	5,933,263.31	692.23	0.16	74.80	744.95
246	J-203	581,820.84	5,933,082.06	694.39	0.28	71.80	744.95
247	J-65	581,778.70	5,931,509.37	710.00	0	78.40	765.22
248	J-113	584,707.09	5,935,813.70	666.13	0	75.10	719.02
249	J-126	584,863.23	5,935,234.31	677.59	0.07	79.90	733.85
251	J-175	583,860.04	5,934,212.11	692.89	0.03	58.10	733.85
252	J-108	584,859.07	5,935,946.29	665.31	0.01	76.20	719.01
253	J-152	584,376.31	5,934,716.20	687.39	0.06	65.90	733.85
254	J-200	581,603.76	5,933,231.65	690.97	0	76.60	744.94
255	J-36	581,245.19	5,931,074.55	710.09	0	77.00	764.35
256	J-143	584,418.36	5,935,234.31	675.12	0	83.40	733.85
257	J-81	581,858.80	5,934,643.74	665.00	0	72.60	716.17
258	J-12	580,220.70	5,931,351.93	710.00	0	76.70	764.02
259	J-226	582,264.78	5,932,630.99	705.95	0.08	55.40	744.96
260	J-45	580,893.42	5,931,477.97	710.00	0.08	77.00	764.28
261	J-17	580,311.95	5,931,197.47	710.00	0	76.70	764.06
262	J-206	581,857.12	5,932,625.05	705.00	0	56.70	744.96
263	J-115	584,825.79	5,935,796.19	666.72	0.03	74.20	719.02
264	J-150	584,403.44	5,934,788.09	687.49	0	65.80	733.85
265	J-77	581,167.95	5,934,784.85	659.73	0	80.10	716.17
266	J-18	580,314.80	5,931,075.86	708.85	0	78.40	764.08
267	J-141	584,418.36	5,935,257.37	675.00	0	83.50	733.85
268	J-8	580,315.10	5,931,044.42	708.00	0.12	79.60	764.08
270	J-118	585,014.92	5,935,991.35	667.08	0.07	73.70	719.01
271	J-34	581,184.46	5,930,958.60	713.60	0	72.00	764.31
272	J-263	580,990.65	5,933,540.47	686.38	0	83.10	744.93
273	J-135	584,890.35	5,935,064.77	680.00	0.08	76.40	733.85
274	J-121	584,820.49	5,935,506.24	675.00	0.01	62.50	719.02
275	J-181	582,540.59	5,933,275.94	693.31	0.04	73.30	744.95
276	J-264	581,189.28	5,933,693.30	681.63	2.45	89.80	744.92
277	J-220	582,117.40	5,932,983.49	695.93	0.32	69.60	744.95
278	J-252	578,937.82	5,934,828.30	660.00	0.01	79.70	716.14
279	J-142	584,423.78	5,935,296.70	675.00	0	83.50	733.85
280	J-109	584,921.74	5,935,884.21	666.76	0.04	74.20	719.01
281	J-129	584,501.09	5,935,261.44	676.15	0.07	81.90	733.85
282	J-39	581,239.51	5,931,322.53	710.00	0	77.20	764.41
283	J-164	583,606.03	5,934,540.88	685.74	0	68.30	733.86

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
285	J-219	582,113.42	5,933,083.07	693.64	0.12	72.80	744.95
286	J-469	580,912.58	5,932,829.94	695.69	0	69.90	744.94
287	J-256	580,441.19	5,935,464.19	655.00	0.04	86.80	716.15
288	J-120	584,734.38	5,935,692.75	670.15	0	69.40	719.02
289	J-230	581,106.83	5,932,460.94	706.93	0	54.00	744.95
290	J-130	584,431.22	5,935,093.29	677.58	0.04	79.90	733.85
291	J-117	585,014.92	5,936,121.64	665.00	0.04	76.70	719.01
292	J-223	582,152.61	5,932,731.90	702.98	0	59.60	744.95
293	J-218	581,867.74	5,931,628.35	710.00	0	79.20	765.79
294	J-46	580,798.60	5,931,476.05	710.00	0	77.00	764.25
295	J-2	579,680.28	5,931,170.16	705.50	0.44	82.90	763.91
296	J-26	580,564.63	5,931,456.51	710.00	0.04	76.90	764.17
297	J-189	581,084.12	5,934,453.39	665.00	0.06	72.60	716.17
298	J-211	581,876.01	5,932,068.33	710.09	0	79.20	765.86
299	J-23	580,668.11	5,931,070.17	710.00	0.04	76.90	764.17
301	J-59	581,386.82	5,931,485.18	710.00	2.45	77.50	764.62
302	J-156	584,404.53	5,934,722.07	688.13	0	64.90	733.85
303	J-199	581,769.17	5,933,510.82	685.00	0.04	85.10	744.93
305	J-148	584,454.98	5,934,760.96	689.42	0.01	63.10	733.85
306	J-132	584,558.06	5,935,001.03	680.87	0.03	75.20	733.85
307	J-19	580,403.49	5,931,080.18	707.98	0	79.70	764.10
308	J-83	581,967.59	5,934,879.14	661.00	0	78.30	716.17
309	J-139	584,644.86	5,935,312.98	676.87	0.04	80.90	733.85
310	J-133	584,653.03	5,935,049.18	680.00	0.03	76.40	733.85
311	J-96	584,368.02	5,935,856.50	660.02	0.04	83.70	719.02
312	J-204	581,850.05	5,933,080.11	694.67	0	71.40	744.95
313	J-52	581,362.87	5,930,976.72	710.00	0	77.30	764.43
314	J-55	581,524.10	5,931,157.51	710.00	0.12	77.70	764.76
315	J-74	580,931.94	5,934,929.32	656.10	0	85.30	716.16
316	J-253	578,957.63	5,934,474.88	660.00	0.01	79.70	716.14
317	J-225	582,168.53	5,932,538.56	707.11	0	53.70	744.96
318	J-186	582,113.31	5,933,524.29	685.00	0	85.10	744.95
319	J-66	581,776.04	5,931,621.09	710.00	0	78.50	765.30
320	J-227	582,440.48	5,932,638.63	706.71	0	54.30	744.96
321	J-54	581,528.40	5,930,990.16	710.00	0	77.50	764.59
322	J-470	580,815.61	5,933,005.16	692.36	0	74.60	744.94
323	J-165	583,521.11	5,934,524.87	687.40	0	65.90	733.86
324	J-32	581,064.31	5,930,954.31	710.00	0.12	77.10	764.29
325	J-42	581,092.22	5,931,480.07	710.00	0.08	77.20	764.37
326	J-178	583,196.31	5,933,356.52	696.11	0.24	69.30	744.95
327	J-93	584,191.17	5,935,768.07	660.00	0.07	83.80	719.02
328	J-97	584,487.83	5,935,930.76	660.00	0.04	83.80	719.02
329	J-122	584,821.83	5,935,460.16	675.00	0.03	62.50	719.02
330	J-84	582,052.57	5,934,877.70	660.32	0.01	79.30	716.17
331	J-62	581,787.29	5,931,163.23	710.00	0	78.00	764.95
332	J-29	580,819.72	5,930,954.31	710.00	0.04	77.00	764.23
333	J-94	584,255.00	5,935,803.19	660.00	0	83.80	719.02
334	J-72	580,939.25	5,935,281.52	655.00	0.04	86.80	716.16

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
335	J-188	582,266.79	5,933,527.86	686.55	0	82.90	744.95
336	J-231	580,791.64	5,934,829.71	658.98	0	81.20	716.16
337	J-229	581,106.36	5,932,407.45	708.32	0.04	52.00	744.95
338	J-466	580,911.13	5,932,595.87	700.92	0	62.50	744.95
339	J-10	579,940.63	5,931,347.65	705.00	0.24	83.80	764.01
340	J-95	584,308.01	5,935,828.08	660.00	0.01	83.80	719.02
341	5 (Dumr	580,618.70	5,931,343.45	710.00	2.73	76.90	764.17
342	J-78	581,169.38	5,934,827.76	658.78	0	81.50	716.17
343	J-99	584,705.73	5,936,073.73	662.40	0.1	80.40	719.01
345	J-7	579,949.27	5,931,039.18	708.18	0	79.30	764.06
346	J-196	581,597.38	5,933,587.35	683.44	0.2	87.30	744.93
347	J-208	581,439.10	5,932,459.61	706.90	0.04	54.00	744.95
348	J-68	580,592.95	5,934,845.60	659.96	0.06	79.80	716.15
349	J-73	580,877.59	5,934,935.04	656.37	0.08	84.90	716.16
350	J-79	581,379.39	5,934,807.01	659.35	0.17	80.70	716.17
351	J-464	580,909.59	5,932,458.81	705.00	0	56.70	744.95
352	J-221	582,125.37	5,932,889.89	698.69	0	65.70	744.95
353	J-63	581,781.57	5,931,261.93	710.00	0.16	78.10	765.03
354	J-48	580,984.87	5,931,374.92	710.00	0	77.10	764.30
355	J-173	583,884.96	5,934,430.17	688.11	0.08	64.90	733.85
356	J-136	584,891.71	5,935,152.93	679.69	0	76.90	733.85
357	J-255	580,263.72	5,934,844.03	655.00	0.03	86.80	716.15
358	J-137	584,631.30	5,935,458.11	675.00	0.06	62.50	719.02
359	J-44	580,980.30	5,931,477.21	710.00	0	77.10	764.31
363	J-69	580,683.06	5,934,980.81	657.45	0.06	83.30	716.16
364	J-461	580,324.91	5,931,786.10	709.66	0.12	76.70	763.71
365	J-50	580,982.78	5,931,104.50	710.00	0	77.10	764.29
366	J-58	581,515.23	5,931,487.78	710.00	0.04	77.70	764.77
367	J-61	581,675.72	5,931,158.94	710.00	0.04	77.90	764.87
368	6 (Dumr	581,521.24	5,931,231.89	710.00	2.73	77.70	764.76
369	J-47	580,657.25	5,931,474.23	710.00	0.04	76.90	764.20
370	J-176	583,816.43	5,934,177.51	694.01	0.18	56.60	733.85
371	J-128	584,625.87	5,935,253.30	677.60	0.06	79.80	733.85
372	J-151	584,368.17	5,934,786.73	686.46	0.03	67.30	733.85
373	J-13	580,314.34	5,931,355.17	710.00	0.04	76.70	764.03
374	J-33	581,129.33	5,930,960.12	711.70	0	74.70	764.30
376	J-123	584,823.26	5,935,405.93	675.00	0	62.50	719.02
378	J-21	580,469.94	5,931,023.06	709.21	0.16	78.00	764.13
379	30 (Dum	582,732.45	5,933,277.32	694.69	2.73	71.30	744.95
380	J-202	581,938.04	5,933,230.80	691.08	0	76.50	744.95
381	J-168	583,530.88	5,933,486.18	696.64	0	68.60	744.95
382	J-49	580,979.92	5,931,250.39	710.00	0.16	77.10	764.30
383	J-110	584,991.94	5,935,799.82	669.94	0.06	69.70	719.01
384	J-102	585,009.28	5,936,277.18	663.86	0.04	78.30	719.01
385	J-31	580,988.50	5,930,955.74	710.00	0	77.10	764.28
386	J-147	584,453.45	5,934,840.49	687.96	0	65.10	733.85
387	J-28	580,746.77	5,930,951.45	710.00	0	77.00	764.21
388	J-24	580,662.38	5,931,227.51	710.00	0	76.90	764.17

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
389	J-465	580,908.44	5,932,502.26	705.00	0	56.70	744.95
390	J-154	584,411.58	5,934,645.67	688.86	0.04	63.90	733.85
391	J-89	582,495.94	5,935,018.15	660.81	0.03	78.60	716.18
392	J-153	584,372.24	5,934,648.39	687.96	0.04	65.10	733.85
394	J-98	584,633.48	5,936,025.02	660.29	0.04	83.40	719.01
395	J-259	580,335.37	5,931,450.69	710.00	0.48	76.60	763.97
396	J-3	579,802.82	5,931,225.65	706.10	0.36	82.10	763.94
397	J-85	582,115.29	5,934,881.39	660.25	0.38	79.40	716.18
398	J-71	580,907.63	5,935,126.70	655.00	0.04	86.80	716.16
399	J-116	585,011.03	5,936,214.00	665.00	0.04	76.70	719.01
400	J-167	583,523.26	5,933,883.17	694.49	0	71.60	744.94
401	J-70	580,800.35	5,935,056.62	655.00	0.04	86.80	716.16
402	J-43	581,021.33	5,931,478.00	710.00	0	77.10	764.33
403	J-179	582,955.94	5,933,296.73	695.00	0	70.90	744.95
406	J-224	582,174.13	5,932,629.80	705.00	0.32	56.70	744.96
407	J-35	581,249.48	5,930,968.71	712.31	0	73.80	764.32
408	J-145	584,444.72	5,934,995.00	679.73	0	76.80	733.85
409	J-170	583,875.75	5,934,103.79	694.22	0	56.30	733.85
410	J-228	582,556.63	5,932,642.20	708.46	0.2	51.80	744.96
411	J-15	580,429.24	5,931,386.27	710.00	0.24	76.80	764.08
412	eson Zo	581,783.00	5,931,386.36	710.00	0.32	78.20	765.12
413	J-262	580,997.23	5,933,183.46	691.01	0	76.50	744.93
414	J-76	581,080.70	5,934,784.85	659.39	0	80.60	716.17
415	J-82	581,851.29	5,934,868.21	661.29	0	77.90	716.17
416	J-187	582,195.09	5,933,525.99	685.61	0.08	84.20	744.95
417	J-124	584,883.57	5,935,380.79	675.00	0	62.50	719.02
418	J-86	582,250.40	5,934,884.38	660.62	0.03	78.90	716.18
419	J-101	584,926.98	5,936,225.99	665.00	0.06	76.70	719.01
420	J-140	584,498.38	5,935,323.83	675.17	0.03	83.30	733.85
422	J-198	581,719.60	5,933,471.45	685.00	0.88	85.10	744.93
423	J-248	581,903.32	5,932,070.50	710.80	0	78.20	765.86
424	J-247	581,891.92	5,931,996.23	710.54	0	78.50	765.88
426	J-5	579,945.61	5,931,212.07	706.57	0	81.50	763.97
427	J-171	583,770.32	5,934,494.96	687.57	0.04	65.70	733.85
428	J-22	580,670.19	5,931,024.49	710.00	0.04	76.90	764.17
429	J-16	580,476.44	5,931,406.30	710.00	0	76.80	764.11
430	J-184	582,112.89	5,933,307.91	690.00	0.12	78.00	744.95
431	J-57	581,518.38	5,931,364.91	710.00	0	77.70	764.77
432	J-11	580,115.27	5,931,356.66	710.00	0.28	76.70	764.02
433	J-467	580,945.04	5,932,670.20	698.68	0.48	65.70	744.94
434	J-127	584,738.45	5,935,230.24	678.28	0.04	78.90	733.85
435	J-20	580,457.07	5,931,080.27	710.00	0.04	76.80	764.11
436	J-172	583,827.64	5,934,460.07	688.49	0.04	64.40	733.85
437	J-157	584,429.91	5,934,843.88	686.75	0.01	66.90	733.85
438	J-161	583,932.31	5,934,795.27	682.13	0	73.40	733.85
439	J-114	584,722.31	5,935,766.42	668.89	0	71.20	719.02
440	J-149	584,407.51	5,934,758.25	688.05	0.03	65.00	733.85
441	akeshor	584,613.31	5,935,863.83	662.35	0.07	80.40	719.02

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
442	J-257	580,273.72	5,935,345.33	655.00	0.01	86.80	716.15
443	J-155	584,414.29	5,934,584.64	689.82	0.03	62.50	733.85
444	0 (Dumr	581,734.36	5,934,653.26	664.25	0.95	73.70	716.17
445	J-125	580,796.41	5,934,677.05	660.00	0.06	79.70	716.16
446	J-193	580,848.07	5,934,368.52	665.00	0.04	72.60	716.16
447	J-194	580,976.24	5,934,190.14	670.34	0.04	65.00	716.16
448	J-209	580,970.10	5,934,678.48	660.00	0.04	79.70	716.16
449	J-214	580,690.97	5,934,694.14	660.00	0	79.70	716.16
450	J-215	580,690.08	5,934,275.57	666.57	0	70.40	716.16
451	J-216	580,551.33	5,931,612.96	710.00	0	77.00	764.22
452	J-274	580,878.67	5,934,350.62	665.00	0	72.60	716.16
453	J-275	582,747.60	5,932,645.50	707.89	0.04	52.60	744.96
454	J-276	582,369.34	5,933,528.13	687.83	0.04	81.10	744.95
455	J-277	582,535.87	5,933,574.49	689.17	0.04	79.20	744.95
456	J-278	582,252.25	5,931,642.45	710.00	0	81.40	767.37
457	79 (Dum	582,429.55	5,931,644.90	712.34	2.73	78.90	767.94
458	J-280	582,657.75	5,931,650.26	715.00	0.84	76.30	768.72
460	J-317	582,199.34	5,932,409.79	709.00	0	51.00	744.96
461	preme S	579,529.45	5,930,618.12	710.00	0	76.50	763.89
462	J-369	580,329.98	5,930,530.83	711.57	0.08	74.60	764.10
463	J-413	584,962.80	5,935,893.67	667.76	0	72.80	719.01
464	J-414	580,992.55	5,933,333.24	690.00	0.04	78.00	744.93
465	J-415	580,322.26	5,930,836.93	709.65	0	77.30	764.10
466	J-416	580,996.56	5,933,257.52	690.00	0	78.00	744.93
467	J-417	581,409.37	5,930,749.49	710.00	0	77.10	764.29
468	J-418	581,473.62	5,930,748.31	710.00	0	77.10	764.29
469	J-426	581,027.60	5,931,617.03	710.00	0	77.20	764.40
470	J-427	581,474.51	5,931,632.42	711.07	0.4	76.30	764.83
472	J-433	581,230.40	5,931,623.34	710.40	0.04	76.70	764.47
473	J-455	585,032.66	5,934,913.17	682.73	0.01	72.60	733.85
474	J-456	584,578.32	5,935,458.14	674.14	0	63.70	719.02
475	J-457	584,473.57	5,935,561.72	668.91	0.03	71.10	719.02
476	J-458	584,552.88	5,935,630.17	668.40	0.01	71.90	719.02
477	J-459	584,630.33	5,935,622.09	670.00	0	69.60	719.02
478	J-460	584,399.04	5,935,479.51	669.91	0.01	69.70	719.02
479	J-462	584,407.26	5,935,625.71	666.69	0.01	74.30	719.02
480	J-473	584,318.20	5,935,632.34	665.00	0	76.70	719.02
481	J-474	580,907.43	5,933,564.98	687.95	0	80.90	744.92
482	J-475	584,394.68	5,934,582.93	689.24	0	63.30	733.85
483	J-476	584,378.97	5,934,558.28	688.81	0	63.90	733.85
484	J-477	584,385.26	5,934,422.76	691.17	0.06	60.60	733.85
485	J-478	584,452.79	5,934,337.14	695.00	0.02	55.10	733.85
486	J-479	584,456.37	5,934,203.11	695.00	0	55.10	733.85
487	J-480	584,346.35	5,934,199.50	695.00	0.03	55.10	733.85
488	untry Sq	584,451.06	5,934,432.27	692.57	0	58.60	733.85
489	J-482	584,501.53	5,934,435.28	693.17	0	57.70	733.85
490	J-483	582,554.17	5,934,938.61	663.74	0	74.40	716.18
491	J-484	580,257.71	5,934,709.77	655.00	0.03	86.80	716.15

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
492	J-485	580,164.03	5,934,700.83	655.00	0.01	86.80	716.15
493	Greenbria	580,160.09	5,934,602.78	655.28	0.06	86.40	716.15
494	J-487	580,157.19	5,934,461.58	658.62	0.01	81.70	716.15
495	J-488	580,264.39	5,934,426.70	660.00	0	79.70	716.15
496	J-489	580,262.15	5,934,273.16	662.79	0.01	75.70	716.15
497	J-490	580,263.09	5,934,169.52	664.93	0.16	72.70	716.15
498	J-491	580,263.09	5,934,052.82	668.12	0	68.20	716.15
499	J-492	580,603.96	5,933,233.91	687.77	0.08	81.10	744.93
500	J-493	580,285.22	5,933,229.98	685.12	0	84.90	744.93
501	J-494	580,019.98	5,933,222.44	681.92	0	89.40	744.93
502	J-496	579,846.07	5,933,216.09	683.33	0	87.40	744.93
503	J-497	579,558.48	5,933,207.86	680.78	0.72	91.10	744.93
504	J-498	579,384.04	5,933,248.61	680.76	0	91.10	744.93
505	J-499	580,585.32	5,935,532.59	655.00	0.04	86.80	716.15
506	J-500	580,800.29	5,934,469.04	664.91	0.04	72.80	716.16
507	Panatton	580,493.51	5,932,097.85	705.00	0.56	56.80	744.99
508	J-502	581,171.70	5,934,953.60	655.96	0.03	85.50	716.17
509	J-503	581,266.41	5,934,961.33	656.39	0.04	84.90	716.17
510	J-504	581,381.72	5,934,985.17	655.83	0.04	85.60	716.17
511	J-505	581,484.80	5,934,976.15	656.63	0.06	84.50	716.17
512	J-506	581,091.17	5,935,043.79	655.00	0.04	86.80	716.17
513	J-507	581,089.89	5,935,190.68	655.00	0.04	86.80	716.17
514	J-508	580,357.88	5,929,962.29	715.00	0	69.70	764.09
515	J-510	582,422.00	5,934,645.84	669.74	0	65.90	716.18
516	J-511	582,750.31	5,934,542.81	677.72	1.49	54.60	716.18
518	J-338	584,547.50	5,934,594.73	690.00	0.02	62.20	733.85
519	J-339	584,844.68	5,934,804.41	685.00	0.06	69.30	733.85
520	J-340	584,755.52	5,934,642.61	690.00	0.14	62.20	733.85
521	J-341	584,801.75	5,934,584.83	690.00	0.03	62.20	733.85
522	J-342	584,626.74	5,934,593.08	689.17	0	63.40	733.85
523	J-343	584,630.05	5,934,465.96	690.99	0.08	60.80	733.85
524	J-344	584,677.93	5,934,368.55	692.43	0	58.80	733.85
525	J-345	584,719.20	5,934,290.95	693.49	0.07	57.30	733.85
526	J-346	584,743.41	5,934,208.42	694.61	0	55.70	733.85
527	J-347	579,821.81	5,934,839.28	655.41	0.22	86.20	716.14
528	J-348	579,906.54	5,934,628.04	660.00	0.13	79.70	716.14
529	J-349	579,552.52	5,934,390.76	660.66	0.04	78.80	716.14
530	J-350	579,560.18	5,934,186.05	665.00	0	72.60	716.14
531	J-351	579,798.46	5,934,185.19	665.00	0.4	72.60	716.14
532	J-352	580,053.20	5,934,194.89	663.47	0	74.80	716.15
533	J-353	580,058.17	5,934,050.10	666.33	0	70.70	716.15
534	J-354	580,312.61	5,932,449.20	700.00	0	63.80	744.96
535	J-355	580,307.45	5,932,622.04	699.36	0	64.70	744.94
536	J-356	579,997.89	5,932,624.62	692.45	0	74.50	744.92
537	J-357	579,512.91	5,932,611.72	692.30	0	74.70	744.89
538	J-358	579,102.08	5,932,475.53	690.19	4.75	77.60	744.87
539	J-359	578,692.37	5,932,179.56	695.00	4.45	70.80	744.87
540	J-360	578,697.01	5,931,540.09	705.00	0	83.00	763.49

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
541	J-361	578,222.97	5,931,414.90	701.79	1.78	61.10	744.82
542	J-362	576,685.76	5,931,405.43	691.85	1.69	74.90	744.64
543	J-363	576,670.09	5,932,150.71	682.23	4.46	88.50	744.60
544	J-364	576,660.70	5,932,987.81	672.00	6.73	62.70	716.16
545	J-365	577,479.18	5,932,164.91	680.63	4.46	90.90	744.69
546	J-367	578,717.06	5,934,829.40	659.32	0.09	80.70	716.14
547	J-368	578,225.64	5,934,575.53	657.00	1.07	83.90	716.14
548	J-370	577,055.12	5,934,577.33	660.00	1.16	79.70	716.13
549	J-371	579,058.45	5,934,237.94	663.97	0	74.00	716.14
550	J-372	582,913.82	5,934,492.65	678.92	0	52.90	716.18
551	J-373	583,715.84	5,934,179.49	692.83	0	58.20	733.85
552	J-374	583,711.11	5,934,323.53	691.08	0.08	60.70	733.85
553	J-375	583,617.79	5,934,384.39	690.00	0	62.20	733.85
554	J-376	583,516.06	5,934,862.86	676.07	0.11	81.90	733.79
555	J-377	583,509.18	5,935,200.72	667.03	0	94.70	733.73
556	J-378	583,929.49	5,935,204.80	671.35	0.62	88.50	733.72
557	J-379	583,908.95	5,935,493.03	665.29	0.6	76.30	719.02
558	J-380	584,314.82	5,935,494.87	667.94	0	72.50	719.02
559	J-381	582,697.16	5,935,191.31	659.04	0	81.10	716.19
560	J-382	583,041.84	5,935,201.63	664.23	0	73.80	716.19
561	J-384	584,690.83	5,933,525.77	696.39	1	68.90	744.97
562	J-385	584,716.16	5,932,759.41	700.00	3.07	63.90	744.99
563	J-386	584,750.39	5,931,678.72	704.69	4.15	86.70	765.79
564	J-387	583,563.61	5,931,658.08	713.93	0	74.20	766.17
565	J-388	583,543.54	5,932,874.51	705.00	0	56.70	744.98
566	J-389	583,975.37	5,932,756.68	705.00	2.68	56.80	744.99
567	J-390	581,655.30	5,929,996.66	715.00	0.36	70.00	764.29
568	91 (Dum	580,970.38	5,929,997.16	715.00	2.73	69.80	764.15
569	J-392	580,813.36	5,929,007.00	720.00	0.04	62.60	764.14
570	J-393	581,663.98	5,929,028.48	715.00	18.21	69.90	764.25
571	J-394	581,271.76	5,928,382.80	719.00	1.34	64.00	764.11
572	J-395	580,870.63	5,928,007.60	715.77	1.92	68.60	764.11
573	J-396	579,994.03	5,927,974.61	710.79	3.7	75.60	764.05
574	J-397	579,174.48	5,927,957.46	715.00	4.49	69.50	763.98
575	J-398	579,153.39	5,928,768.73	712.26	3.43	73.40	763.97
576	J-399	579,124.50	5,929,557.08	715.00	4.49	69.50	763.93
577	J-400	579,105.90	5,930,558.91	710.00	2.53	76.50	763.87
578	J-401	579,838.42	5,929,089.06	711.05	4.38	75.20	764.02
579	J-402	582,479.98	5,930,426.58	717.66	0	67.80	765.41
580	J-403	583,291.35	5,930,024.89	715.00	0	71.20	765.16
581	J-404	584,008.12	5,930,317.94	710.00	4.3	78.30	765.19
582	J-406	584,887.98	5,930,054.27	710.00	4.49	77.90	764.86
583	J-407	584,895.38	5,929,247.13	710.00	4.5	77.60	764.70
584	J-408	584,916.02	5,928,301.28	710.00	1.93	77.50	764.63
585	J-409	584,067.45	5,928,313.11	710.00	2.15	77.50	764.63
586	J-410	583,221.53	5,928,298.46	717.75	2.26	66.50	764.62
587	J-411	582,457.82	5,928,275.54	720.00	1.29	63.30	764.62
588	J-412	582,422.40	5,929,556.63	716.72	2.1	68.30	764.85

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
589	J-420	583,620.42	5,929,590.40	716.07	4.42	69.30	764.88
590	J-421	583,218.17	5,929,151.91	715.00	0	70.50	764.68
591	J-422	582,450.12	5,928,880.13	715.00	0	70.40	764.63
592	J-423	584,057.49	5,929,227.06	710.00	4.48	77.60	764.70
593	J-424	581,660.97	5,929,623.62	713.50	0.12	72.00	764.24
594	J-425	581,665.24	5,929,366.79	715.00	0	69.90	764.25
596	J-429	584,050.71	5,934,639.34	683.04	0.18	72.10	733.85
597	J-430	584,216.79	5,934,482.79	688.98	0.23	63.70	733.85
598	J-431	584,057.80	5,934,105.74	690.03	0.01	62.20	733.85
600	J-435	584,997.94	5,934,344.14	690.00	0.26	62.20	733.85
601	J-436	585,098.32	5,934,735.10	689.76	0	62.60	733.85
602	J-437	584,749.37	5,934,767.29	686.86	0	66.70	733.85
603	J-438	584,571.05	5,934,804.08	690.00	0.03	62.20	733.85
604	J-439	580,563.59	5,929,433.52	710.00	1.71	76.80	764.13
605	J-440	577,488.21	5,931,964.01	685.04	0	84.70	744.69
606	J-441	577,498.53	5,931,408.86	695.00	2.64	70.50	744.69
607	J-442	578,704.52	5,935,246.24	656.72	0.79	84.30	716.14
609	J-444	582,796.35	5,930,027.09	720.00	3.24	64.10	765.18
610	J-445	577,047.21	5,933,899.96	663.15	4.46	75.20	716.13
614	J-449	581,421.38	5,932,595.83	704.53	0.84	57.40	744.95
615	J-450	579,529.68	5,930,833.39	710.00	0	76.50	763.89
616	J-451	582,718.01	5,933,794.15	686.82	0.32	82.50	744.94
617	J-452	584,568.62	5,934,437.45	692.38	0.1	58.90	733.85
618	J-453	584,709.29	5,934,821.05	685.00	0.08	69.30	733.85
619	J-454	578,967.63	5,931,180.10	705.00	0.36	83.40	763.76
620	J-463	579,109.34	5,929,955.19	715.00	1.85	69.40	763.92
621	J-481	579,912.34	5,929,983.06	710.05	0.48	76.50	763.96
623	J-495	581,742.29	5,930,634.26	710.00	0	77.10	764.29
624	J-514	581,024.45	5,930,758.71	710.00	0.16	77.00	764.23
625	J-509	582,414.25	5,929,796.24	715.00	2.47	70.90	764.96
1202	J-515	581,712.08	5,932,708.51	700.00	0.2	63.80	744.94
1205	J-516	581,669.94	5,929,192.84	715.00	0	69.90	764.25
1210	J-518	581,830.29	5,929,625.08	715.00	0	69.90	764.24
1212	J-519	581,835.07	5,929,999.06	715.66	0	69.00	764.29
1215	J-520	583,628.60	5,934,178.46	691.55	0	60.00	733.85
1217	J-521	579,709.90	5,934,475.78	661.19	0	78	716.14
1221	J-523	579,612.49	5,934,670.51	660	0	79.7	716.14
1223	J-524	579,458.36	5,934,392.85	660	0	79.7	716.14
1225	J-525	579,864.05	5,934,327.41	663.27	0	75	716.14
1247	J-529	581,722.82	5,930,546.21	711.81	0	74.5	764.29
1250	J-530	581,718.67	5,930,439.72	715	0	70	764.29
1252	J-531	581,695.54	5,930,265.84	715	0	70	764.29
1254	J-532	581,651.35	5,930,158.96	715	0	70	764.29
1261	J-535	580,317.76	5,932,082.48	705	0	56.8	745
1266	J-536	579,735.35	5,931,890.66	705.76	2.48	82.1	763.57
1268	J-537	579,384.24	5,931,741.18	705	0.08	83.1	763.53
1272	J-539	579,340.40	5,932,056.77	700	1.65	90.2	763.53
1274	J-540	579,699.30	5,932,009.28	700.12	0	90.1	763.57

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1276	J-541	579,799.44	5,931,732.09	706.82	0	80.6	763.58
1279	J-542	580,321.43	5,931,912.84	706.22	0	81.5	763.62
1289	J-546	579,073.46	5,931,613.43	705	0.84	83.1	763.51
1293	J-547	580,088.01	5,932,060.24	705.55	0	82.4	763.59
1303	J-550	579,304.34	5,931,106.29	705.49	0	82.8	763.83
1308	J-552	581,774.56	5,934,875.22	660.36	0.01	79.2	716.17
1310	J-553	584,830.76	5,934,337.70	691.53	0	60.1	733.85
1313	J-554	581,603.99	5,933,308.60	689.95	0	78.1	744.93
1317	J-555	581,321.58	5,933,537.76	685.33	0	84.6	744.92
1320	J-556	581,323.99	5,933,415.23	687.59	0	81.4	744.92
1322	J-557	581,250.04	5,933,467.96	686.55	0	82.9	744.92
1323	J-558	581,327.56	5,933,467.96	686.59	0	82.8	744.92
1330	J-560	584,062.95	5,933,663.17	698.76	0.48	65.6	744.95
1333	J-561	582,080.53	5,931,638.76	710	0	80.7	766.83
1336	J-562	582,569.27	5,933,781.52	685	0.04	85.1	744.94
1339	J-563	583,023.88	5,933,806.52	689.56	1.08	78.6	744.94
1342	J-564	583,338.73	5,933,881.24	692.98	0	73.8	744.94
1345	J-565	582,744.06	5,932,889.49	701.99	0	61	744.96
1348	J-566	582,939.07	5,932,645.59	708.52	0.04	51.7	744.96
1351	J-567	583,002.33	5,932,556.57	709	0.04	51	744.96
1353	J-568	581,247.75	5,932,942.22	695.05	0	70.8	744.94
1356	J-569	580,577.37	5,932,096.86	705.31	0	56.3	744.98
1359	J-570	580,889.17	5,932,276.53	705.71	0	55.7	744.96
1362	J-571	580,880.65	5,932,177.12	706.82	0	54.2	744.97
1366	J-573	579,703.90	5,930,618.74	710	0.2	76.5	763.91
1369	J-574	579,904.79	5,930,431.14	710	0	76.6	763.93
1372	J-575	580,334.11	5,930,381.44	712.92	0	72.6	764.1
1375	J-576	581,433.82	5,929,694.07	715	1.8	69.9	764.21
1385	J-577	578,886.69	5,931,210.46	705	0	83.4	763.72
1387	J-578	580,835.80	5,932,122.19	707.37	0	53.4	744.97
1390	J-579	579,380.19	5,933,203.20	681.18	0	90.5	744.93
1395	J-582	579,207.27	5,933,179.51	680.57	1.11	91.4	744.93
1399	J-584	583,409.70	5,930,823.23	715	0	71.8	765.55
1401	J-585	583,613.66	5,930,025.23	708.86	0	79.9	765.14
1405	J-586	581,295.24	5,929,939.38	715	0.12	69.8	764.18
1410	J-588	582,796.31	5,931,225.82	716.44	0.4	72.9	767.8
1422	J-590	582,460.14	5,928,520.74	720	3.94	63.3	764.62
1425	J-591	583,549.35	5,932,202.80	710	3.45	79.5	766.03
1428	J-592	578,708.52	5,931,205.20	706.2	0.57	81.5	763.64
1435	J-595	577,630.09	5,930,951.63	701.67	3.06	88	763.64
1437	J-596	577,630.09	5,930,329.83	710	4.16	76.2	763.66
1442	J-598	578,276.18	5,930,332.49	710	4.32	76.3	763.72
1445	J-599	578,408.19	5,931,119.25	707.61	0	79.5	763.64
1449	J-601	579,260.41	5,934,216.98	664.6	0.73	73.2	716.14
1452	J-602	579,239.65	5,934,831.22	656.38	0	84.8	716.14
1459	J-604	580,481.32	5,934,271.82	664.6	0.74	73.2	716.15
1462	J-605	581,613.21	5,934,259.07	671.37	0.42	63.6	716.17
1466	J-606	582,281.16	5,931,229.50	710	2.49	81.3	767.26

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1473	J-607	579,543.45	5,929,983.64	715	0	69.5	763.94
1475	J-608	580,203.48	5,929,958.96	713.28	0	72	764.01
1478	J-609	580,201.01	5,929,860.38	713.35	0	71.9	764.01
1480	J-610	580,552.48	5,929,989.36	715	0.76	69.7	764.13
1483	J-611	580,325.86	5,930,727.51	710	0	76.8	764.11
1499	J-613	584,353.40	5,933,669.57	695.76	2.87	69.8	744.96
1504	J-614	582,934.11	5,932,889.06	702.94	0	59.6	744.96
1521	J-617	576,696.06	5,930,806.93	697.46	0.83	93.9	763.64
1526	J-619	583,965.70	5,931,182.45	713.27	2.07	74.6	765.81
1529	J-620	583,426.67	5,930,620.38	719.95	0	64.6	765.45
1538	J-621	578,694.88	5,931,642.14	700.74	0	62.8	744.97
1542	J-622	584,014.70	5,930,037.23	715	0	71.2	765.13
1545	J-623	579,142.16	5,929,148.03	715	0	69.5	763.97
1548	J-624	580,979.44	5,929,436.53	710	2.52	76.8	764.13
1552	J-626	582,439.40	5,929,055.55	714.43	0	71.3	764.63
1556	J-628	580,375.92	5,929,164.92	717.44	0	66.2	764.1
1559	J-629	580,365.57	5,929,526.73	705	0	83.9	764.1
1563	J-631	580,387.52	5,927,986.11	715	0.37	69.7	764.11
1604	J-632	580,288.92	5,933,147.51	687.49	0	81.5	744.93
1619	J-634	580,375.70	5,929,000.34	718.77	0	64.3	764.1
1623	J-635	582,786.29	5,930,481.33	720	4.05	64.8	765.62
1634	J-637	578,683.08	5,932,473.92	690.87	0	76.7	744.87
1681	J-642	581,668.12	5,929,095.99	715	0	69.9	764.25
1711	J-644	583,046.25	5,935,496.03	657.92	0.77	82.7	716.19
1741	J-647	581,271.30	5,929,015.97	720	0	62.7	764.17
1744	48 (Dum	581,275.92	5,928,657.02	720	2.73	62.7	764.15
1746	J-649	581,116.31	5,928,684.12	720	0	62.7	764.15
1748	J-650	581,110.60	5,929,012.69	721.17	0	61	764.16
1857	J-662	581,970.85	5,935,022.33	659.84	0.04	80	716.17
1859	J-663	582,116.21	5,935,056.50	657.14	0.05	83.8	716.18
1930	J-668	579,102.84	5,931,112.30	705.76	0.25	82.4	763.79
1933	J-669	583,535.99	5,932,752.55	705	1.8	56.8	744.99
1936	J-670	583,961.86	5,933,365.46	700	0.94	63.8	744.97
1938	J-671	583,518.52	5,931,175.41	715	1.98	72.1	765.81
1941	J-672	584,343.63	5,931,657.91	705	2.03	86.3	765.82
1944	J-673	580,373.82	5,928,781.54	710.94	0.33	75.5	764.1
1947	J-674	584,337.86	5,932,018.97	706.68	3.86	84.1	765.91
1949	J-675	579,907.29	5,930,219.27	710	0.5	76.6	763.95
1952	J-676	580,043.39	5,929,961.76	711.5	0.15	74.5	763.98
1955	J-677	581,118.82	5,928,478.68	720	1.4	62.6	764.14
1956	J-678	580,803.49	5,928,525.59	713.58	0	71.7	764.12
1957	J-679	580,802.56	5,928,372.79	716.43	0	67.7	764.11
1959	J-681	580,378.87	5,928,367.84	710	0	76.8	764.11
1965	J-682	578,966.18	5,934,323.21	662.52	0.19	76.1	716.14
1969	J-683	580,796.56	5,933,569.23	687.51	0.96	81.5	744.92
1970	J-684	580,269.86	5,933,725.09	675.19	0.43	99	744.93
1974	J-685	580,448.50	5,933,230.44	686.51	1.12	82.9	744.93
1977	J-686	580,280.05	5,933,437.59	680.95	0.56	90.8	744.93

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
1980	J-687	580,334.63	5,930,185.02	714.34	0.11	70.6	764.1
1983	J-688	580,557.45	5,930,744.75	710	0.15	76.9	764.15
1986	J-689	581,209.13	5,929,990.60	715	0.4	69.8	764.17
1989	J-690	582,115.87	5,934,642.64	664.96	0.37	72.7	716.17
1995	J-692	580,367.90	5,935,411.75	655	0.19	86.8	716.15
1998	J-693	580,939.14	5,935,207.44	655	0.03	86.8	716.16
2001	J-694	581,593.23	5,933,015.33	699.23	0.42	64.9	744.94
2004	J-695	581,706.64	5,932,861.89	698.36	0.5	66.1	744.94
2007	J-696	585,110.51	5,930,733.81	710	0	78.6	765.36
2009	J-697	580,594.61	5,929,003.29	722.94	0.61	58.5	764.12
2012	J-698	579,772.86	5,930,616.65	710	0.11	76.5	763.91
2015	J-699	581,656.96	5,929,786.31	715	0.06	69.9	764.26
2020	J-700	584,566.88	5,934,158.53	695	0.08	55.1	733.85
2024	J-701	579,705.90	5,933,212.88	682	0.9	89.3	744.93
2027	J-702	582,798.78	5,931,094.66	716	1.97	73.4	767.69
2030	J-703	583,042.23	5,935,001.28	669.77	0.62	65.9	716.19
2033	J-704	581,714.42	5,934,441.08	668.91	0	67.1	716.17
2038	J-705	580,902.73	5,927,660.12	715	0	69.9	764.22
2039	J-706	583,647.50	5,927,753.89	710	0	77.5	764.59
2040	J-707	580,267.35	5,933,787.67	674.05	0	100.6	744.93
2045	J-708	583,620.77	5,928,790.07	715	0	70.5	764.67
2048	J-709	584,218.05	5,933,682.14	696.07	0	69.4	744.96
2051	J-710	584,263.37	5,932,753.23	704.52	0	57.4	744.99
2054	J-711	584,752.84	5,931,333.50	708	0	82	765.8
2062	J-712	584,428.67	5,927,760.57	710	0	77.5	764.61
2064	J-713	584,319.60	5,931,332.55	708.64	0	81.1	765.81
2071	J-715	583,984.76	5,930,837.44	713.33	0	73.9	765.36
2087	J-716	583,622.05	5,929,187.03	712.59	0	74	764.71
2090	J-717	583,632.05	5,928,302.37	713.99	0	71.9	764.63
2093	J-718	583,981.82	5,932,017.05	712	0	76.7	766.03
2142	J-719	582,112.92	5,929,042.77	714.67	0	70.7	764.47
2145	J-720	581,900.54	5,929,036.19	714.83	0	70.3	764.36
2148	J-721	585,115.48	5,935,430.98	672.05	0	66.7	719.01
2153	J-723	581,364.59	5,933,637.12	683.4	0	87.3	744.92
2155	J-724	581,503.77	5,933,636.39	683.4	0	87.3	744.92
2157	J-725	581,505.07	5,933,898.96	680	0	92.1	744.92

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
654	P-120	J-102	J-116	63.00	200	120.00	0.00	0	0	0	PVC
655	P-156	J-147	J-148	80.00	200	120.00	0.53	0.02	0	0.004	PVC
656	P-78	J-73	J-74	58.00	200	120.00	-1.61	0.05	0.001	0.026	PVC
657	P-95	J-90	J-91	95.00	200	120.00	-1.33	0.04	0.002	0.018	PVC
658	P-74	J-69	J-70	140.00	200	120.00	-1.41	0.04	0.003	0.02	PVC
659	P-201	J-191	J-192	96.00	300	120.00	-6.43	0.09	0.004	0.046	PVC
660	P-5	J-5	J-7	173.00	200	120.00	-8.00	0.25	0.086	0.499	PVC
661	P-119	J-115	J-109	130.00	200	120.00	0.36	0.01	0	0.002	PVC
662	P-307(2)	J-471	J-470	147.00	300	120.00	-3.03	0.04	0.002	0.011	PVC
663	P-216	J-205	J-206	353.00	300	120.00	-4.12	0.06	0.005	0.02	PVC
664	P-124	J-119	J-110	95.00	200	120.00	0.13	0	0	0	PVC
665	P-17	J-17	J-18	122.00	300	110.00	-13.19	0.19	0.025	0.206	Asbestos Cement
666	P-11	J-11	J-12	113.00	300	120.00	-6.38	0.09	0.005	0.046	PVC
667	P-73	J-68	J-69	169.00	200	120.00	-1.36	0.04	0.003	0.018	PVC
668	P-235	J-223	J-224	98.00	300	120.00	-3.54	0.05	0.002	0.015	PVC
669	P-46	J-44	J-45	77.00	300	110.00	17.40	0.25	0.03	0.344	Asbestos Cement
670	P-152	J-131	J-145	12.00	200	120.00	-0.67	0.02	0	0.006	PVC
671	P-141	J-134	J-135	126.00	150	120.00	0.00	0	0	0	PVC
672	P-30	J-28	J-29	73.00	300	110.00	-16.01	0.23	0.022	0.294	Asbestos Cement
673	P-195	J-185	J-186	131.00	300	120.00	0.44	0.01	0	0	PVC
674	P-306(2)	J-472	J-471	85.00	300	120.00	-3.03	0.04	0.001	0.011	PVC
675	P-215	J-204	J-205	197.00	300	120.00	-4.12	0.06	0.004	0.02	PVC
676	P-159	J-150	J-151	35.00	200	120.00	0.11	0	0	0	PVC
677	P-16	J-13	J-17	156.00	300	110.00	-13.19	0.19	0.032	0.206	Asbestos Cement
678	P-160	J-151	J-152	71.00	200	120.00	0.08	0	0	0	PVC
679	P-110	J-106	J-107	37.00	200	120.00	-0.02	0	0	0	PVC
680	P-10	J-10	J-11	167.00	300	120.00	-6.10	0.09	0.007	0.042	PVC
681	P-234	J-222	J-223	81.00	300	120.00	-3.54	0.05	0.001	0.015	PVC
682	P-72	J-67	J-58	158.00	300	110.00	41.28	0.58	0.28	1.701	Asbestos Cement
683	P-135	J-128	J-129	126.00	150	120.00	0.12	0.01	0	0.001	PVC
684	P-26	J-25 (Dummy)	J-26	119.00	300	110.00	-0.28	0	0	0	Asbestos Cement
685	P-172	J-162	J-163	145.00	300	120.00	-1.94	0.03	0.001	0.005	PVC
686	P-140	J-133	J-134	114.00	200	120.00	0.05	0	0	0	PVC
687	P-158	J-149	J-150	30.00	200	120.00	0.11	0	0	0.002	PVC
688	P-52	J-49	J-50	146.00	300	110.00	5.78	0.08	0.007	0.045	Asbestos Cement
689	P-148	J-129	J-141	83.00	150	120.00	0.00	0	0	0	PVC
690	P-182	J-173	J-174	102.00	200	120.00	0.35	0.01	0	0.001	PVC
691	P-282	J-252	J-253	357.00	300	120.00	-0.63	0.01	0	0	HDPE
692	P-217	J-206	J-207	75.00	300	120.00	-7.43	0.11	0.01	0.06	PVC
693	P-15	J-15	J-16	51.00	300	110.00	-23.08	0.33	0.03	0.578	Asbestos Cement
694	P-109	J-99	J-106	76.00	200	120.00	0.02	0	0	0	PVC
695	P-142	J-135	J-136	88.00	200	120.00	0.33	0.01	0	0.002	PVC
696	P-181	J-172	J-173	65.00	200	120.00	0.75	0.02	0	0.006	PVC
697	P-71	J-66	J-67	156.00	300	110.00	41.28	0.58	0.251	1.7	Asbestos Cement
698	P-193	J-183	J-184	75.00	300	120.00	1.05	0.01	0	0.001	PVC
699	P-238	J-226	J-227	86.00	300	120.00	-0.63	0.01	0	0	PVC
700	P-157	J-148	J-149	48.00	200	120.00	0.27	0.01	0	0	PVC
701	P-75	J-70	J-71	128.00	200	120.00	0.11	0	0	0	PVC
702	P-147	J-129	J-140	62.00	150	120.00	0.63	0.04	0.001	0.019	PVC
703	P-129	J-122	J-123	62.00	200	120.00	0.00	0	0	0	PVC
704	P-92	J-87	J-88	83.00	200	120.00	-1.17	0.04	0.001	0.014	PVC
705	P-171	J-161	J-162	175.00	300	120.00	-1.94	0.03	0.001	0.005	PVC
706	P-206	J-196	J-197	78.00	300	120.00	-4.21	0.06	0.002	0.021	PVC
707	P-45	J-43	J-44	40.00	300	110.00	23.34	0.33	0.024	0.591	Asbestos Cement
708	P-258	PMP-101	J-234	2.00	150	120.00	0.00	0	0	0	PVC
709	P-276	J-248	J-211	11.00	300	120.00	13.38	0.19	0.005	0.182	PVC
710	P-189	J-179	J-180 (Dummy)	237.00	350	120.00	1.18	0.01	0	0.001	PVC
711	P-33	J-31	J-32	76.00	300	110.00	-10.35	0.15	0.01	0.131	Asbestos Cement
712	P-84	J-79	J-80 (Dummy)	386.00	250	120.00	-1.31	0.03	0.002	0.006	PVC
713	P-255	PMP-104	J-237	2.00	250	120.00	0.00	0	0	0	PVC
714	P-29	J-27	J-28	77.00	300	110.00	-16.01	0.23	0.023	0.294	Asbestos Cement
715	P-118	J-114	J-115	108.00	200	120.00	0.39	0.01	0	0.002	PVC
716	P-9	J-5	J-10	137.00	200	120.00	-5.86	0.19	0.038	0.281	PVC
718	P-229	J-217	J-218	31.00	300	120.00	-81.91	1.16	0.16	5.151	PVC
719	P-265	J-241	PMP-103	2.00	600	120.00	0.00	0	0	0	PVC
720	P-210	J-200	J-201	211.00	300	120.00	-5.96	0.08	0.008	0.04	PVC
721	P-232	J-220	J-221	94.00	300	120.00	-3.54	0.05	0.001	0.016	PVC
722	P-32	J-30	J-31	86.00	300	110.00	-16.13	0.23	0.026	0.299	Asbestos Cement
723	P-108	J-96	J-105	160.00	200	120.00	0.07	0	0	0	PVC
724	P-133	J-126	J-127	125.00	150	120.00	0.26	0.01	0.001	0.004	PVC
725	P-174	J-164	J-165	87.00	300	120.00	-3.50	0.05	0.001	0.015	PVC
726	P-134	J-127	J-128	116.00	150	120.00	0.22	0.01	0	0.003	PVC
727	P-190	J-180 (Dummy)	J-181	119.00	350	120.00	2.55	0.03	0.001	0.004	PVC
728	P-211	J-201	J-202	129.00	360	120.00	-2.12	0.02	0	0.002	HDPE
729	P-300	OLD FIRE PUMP	J-265	145.00	300	120.00	0.00	0	0	0	PVC
730	P-144	J-122	J-137	191.00	200	120.00	-0.46	0.01	0	0.002	PVC
731	P-231	J-219	J-220	100.00	300	120.00	-3.22	0.05	0.001	0.013	PVC
732	P-70	J-65	J-66	106.00	300	110.00	-27.06	0.38	0.087	0.778	Asbestos Cement
733	P-35	J-33	J-34	60.00	300	110.00	-10.47	0.15	0.007	0.134	Asbestos Cement
734	P-117	J-113	J-114	51.00	200	120.00	-0.02	0	0	0	PVC
735	P-184	J-175	J-177	34.00	200	120.00	0.27	0.01	0	0.002	PVC
736	P-112	J-108	J-109	88.00	200	120.00	-0.03	0	0	0	PVC
737	P-150	J-141	J-143	23.00	150	120.00	0.00	0	0	0	PVC
738	P-177	J-167	J-168	458.00	300	120.00	-4.27	0.06	0.009	0.022	PVC
739	P-115	J-97	Lakeshore	143.00	200	120.00	0.05	0	0	0	PVC
740	P-192	J-182	J-183	257.00	350	120.00	0.07	0	0	0	PVC
741	P-251	J-235	J-236	2.00	400	120.00	0.00	0	0	0	PVC
742	P-68	J-63	Acheson Zone 3	124.00	300	110.00	-26.74	0.38	0.095	0.761	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
743	P-309	J-469	J-468 (Dummy)	89.00	300	120.00	-3.03	0.04	0.001	0.011	PVC
744	P-146	J-128	J-139	63.00	150	120.00	0.04	0	0	0	PVC
745	P-97	J-93	J-94	73.00	200	120.00	0.33	0.01	0	0.001	PVC
746	P-237	J-224	J-226	96.00	300	120.00	-0.55	0.01	0	0.001	PVC
747	P-128	J-121	J-122	38.00	200	120.00	-0.42	0.01	0	0.003	PVC
748	P-22	J-21	J-22	200.00	300	110.00	-13.35	0.19	0.042	0.21	Asbestos Cement
749	P-122	J-117	J-118	130.00	200	120.00	-0.09	0	0	0	PVC
750	P-230	J-183	J-219	149.00	300	120.00	-3.10	0.04	0.002	0.012	PVC
751	P-104	J-100	J-101	111.00	200	120.00	0.14	0	0	0	PVC
753	P-61	J-57	J-58	116.00	300	110.00	-6.99	0.1	0.008	0.063	Asbestos Cement
754	P-126	J-114	J-120	75.00	200	120.00	-0.41	0.01	0	0.002	PVC
755	P-28	J-22	J-27	72.00	300	110.00	-15.89	0.22	0.021	0.29	Asbestos Cement
756	P-44	J-42	J-43	77.00	300	110.00	23.34	0.33	0.042	0.592	Asbestos Cement
757	P-197	J-187	J-188	74.00	300	120.00	0.36	0.01	0	0	PVC
758	P-20	J-19	J-20	49.00	300	110.00	-13.15	0.19	0.011	0.205	Asbestos Cement
759	P-80	J-75	J-76	179.00	200	120.00	-1.03	0.03	0.002	0.011	PVC
760	P-261	J-241	J-242	2.00	600	120.00	0.00	0	0	0	PVC
761	P-298	J-234	J-265	2.00	300	120.00	0.00	0	0	0	PVC
762	P-102	J-98	J-99	87.00	200	120.00	0.33	0.01	0	0.002	PVC
763	P-254	J-238	PMP-105	2.00	250	120.00	0.00	0	0	0	PVC
764	P-291	J-192	J-264	218.00	300	120.00	-3.41	0.05	0.003	0.014	PVC
765	P-281	J-14	J-259	44.00	300	120.00	29.61	0.42	0.052	0.783	PVC
766	P-64	J-60	J-40	31.00	300	110.00	31.80	0.45	0.036	1.048	Asbestos Cement
767	P-3	J-3	J-4	65.00	300	120.00	-13.86	0.2	0.013	0.191	PVC
768	P-83	J-78	J-79	214.00	250	120.00	-1.14	0.02	0.001	0.005	PVC
769	P-14	J-14	J-15	120.00	300	110.00	-22.84	0.32	0.053	0.569	Asbestos Cement
770	P-58	J-54	J-55	167.00	300	110.00	-30.68	0.43	0.164	0.981	Asbestos Cement
771	P-55	J-51	J-52	57.00	300	110.00	-30.56	0.43	0.05	0.975	Asbestos Cement
772	P-167	J-157	J-158	22.00	250	120.00	-2.08	0.04	0	0.012	PVC
773	P-137	J-130	J-131	98.00	200	120.00	-0.62	0.02	0	0.005	PVC
774	P-105	J-101	J-102	98.00	200	120.00	0.08	0	0	0.001	PVC
775	P-101	J-97	J-98	173.00	200	120.00	0.37	0.01	0	0.002	PVC
776	P-188	J-178	J-179	247.00	350	120.00	1.18	0.01	0	0.001	PVC
777	P-228	J-217	J-66	67.00	300	120.00	81.91	1.16	0.323	5.151	PVC
778	P-38	J-36	J-37	94.00	300	110.00	-15.32	0.22	0.026	0.271	Asbestos Cement
779	P-41	J-39	J-40	154.00	300	110.00	-15.36	0.22	0.044	0.273	Asbestos Cement
780	P-154	J-145	J-146	133.00	200	120.00	-0.83	0.03	0.001	0.007	PVC
781	P-63	J-59	J-60	123.00	300	110.00	31.80	0.45	0.125	1.049	Asbestos Cement
782	P-164	J-149	J-156	36.00	200	120.00	0.14	0	0	0.002	PVC
784	P-287	J-257	J-255	556.00	200	120.00	-0.29	0.01	0.001	0.001	HDPE
785	P-59	J-55	J-56 (Dummy)	74.00	300	110.00	-4.26	0.06	0.002	0.025	Asbestos Cement
786	P-243	J-231	J-73	144.00	200	120.00	0.04	0	0	0	PVC
787	P-264	J-242	PMP-102	2.00	600	120.00	0.00	0	0	0	PVC
788	P-7	J-7	J-8	371.00	300	120.00	-8.04	0.11	0.026	0.07	PVC
789	P-268	R-1	J-239	2.00	600	120.00	0.00	0	0	0	PVC
790	P-88	J-83	J-84	56.00	200	120.00	-0.66	0.02	0	0.005	PVC
791	P-121	J-116	J-117	92.00	200	120.00	-0.05	0	0	0.001	PVC
792	P-79	J-74	J-75	142.00	200	120.00	-1.61	0.05	0.004	0.026	PVC
793	P-24	J-23	J-24	158.00	300	110.00	2.45	0.03	0.001	0.009	Asbestos Cement
794	P-47	J-45	J-46	103.00	300	110.00	17.32	0.24	0.032	0.34	Asbestos Cement
795	P-31	J-29	J-30	83.00	300	110.00	-16.05	0.23	0.024	0.295	Asbestos Cement
796	P-196	J-186	J-187	92.00	300	120.00	0.44	0.01	0	0	PVC
797	P-107	J-94	J-104	107.00	200	120.00	-0.26	0.01	0	0.001	PVC
799	P-161	J-152	J-153	68.00	200	120.00	0.16	0.01	0	0	PVC
800	P-250	J-234	J-235	2.00	400	120.00	0.00	0	0	0	PVC
801	P-136	J-129	J-130	187.00	200	120.00	-0.58	0.02	0.001	0.004	PVC
802	P-27	J-26	J-16	95.00	300	110.00	23.08	0.33	0.059	0.58	Asbestos Cement
803	P-173	J-163	J-164	99.00	300	120.00	-2.78	0.04	0.001	0.01	PVC
804	P-66	J-61	J-62	112.00	300	110.00	-26.58	0.38	0.084	0.752	Asbestos Cement
805	P-284	J-68	J-255	311.00	200	120.00	1.30	0.04	0.006	0.017	HDPE
806	P-257	PMP-102	J-235	2.00	150	120.00	0.00	0	0	0	PVC
807	P-218	J-207	J-208	408.00	300	120.00	5.92	0.08	0.017	0.04	PVC
808	P-239	J-227	J-228	96.00	300	120.00	-0.63	0.01	0	0.001	PVC
809	P-18	J-18	J-8	31.00	300	110.00	-0.03	0	0	0	Asbestos Cement
811	P-130	J-123	J-124	65.00	200	120.00	0.00	0	0	0	PVC
812	P-143	J-136	J-126	89.00	200	120.00	0.33	0.01	0	0.001	PVC
813	P-93	J-88	J-89	68.00	200	120.00	-1.24	0.04	0.001	0.015	PVC
814	P-207	J-197	J-198	121.00	300	120.00	0.92	0.01	0	0.001	PVC
815	P-149	J-141	J-142	40.00	150	120.00	0.00	0	0	0	PVC
816	P-259	J-239	J-240	2.00	600	120.00	0.00	0	0	0	PVC
817	P-34	J-32	J-33	60.00	300	110.00	-10.47	0.15	0.009	0.133	Asbestos Cement
818	P-85	J-80 (Dummy)	J-81	125.00	250	120.00	-0.78	0.02	0	0.002	PVC
819	P-256	PMP-103	J-236	2.00	200	120.00	0.00	0	0	0	PVC
820	P-183	J-174	J-175	119.00	200	120.00	0.29	0.01	0	0.001	PVC
821	P-266	J-240	PMP-104	2.00	600	120.00	0.00	0	0	0	PVC
822	P-111	J-107	J-108	99.00	200	120.00	-0.02	0	0	0	PVC
823	P-308(2)	J-470	J-469	207.00	300	120.00	-3.03	0.04	0.002	0.012	PVC
824	P-233	J-221	J-222	79.00	300	120.00	-3.54	0.05	0.001	0.015	PVC
825	P-175	J-165	J-166	352.00	300	120.00	-11.64	0.16	0.041	0.139	PVC
826	P-53	J-50	J-31	149.00	300	110.00	5.78	0.08	0.007	0.045	Asbestos Cement
827	P-96	J-86	J-92	190.00	200	120.00	0.03	0	0	0	PVC
828	P-191	J-181	J-182	234.00	350	120.00	1.12	0.01	0	0.001	PVC
831	P-145	J-138	J-128	73.00	150	120.00	0.00	0	0	0	PVC
832	P-273	J-218	J-246	35.00	300	120.00	-81.91	1.16	0.154	5.152	PVC
833	P-185	J-177	J-170	76.00	200	120.00	0.72	0.02	0	0.005	PVC
834	P-213	J-201	J-203	142.00	300	120.00	-3.84	0.05	0.003	0.018	PVC
835	P-114	J-110	J-111	107.00	200	120.00	0.07	0	0	0	PVC
836	P-178	J-168	J-169	64.00	300	120.00	-8.19	0.12	0.009	0.072	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
837	P-151	J-143	J-144	26.00	150	120.00	0.00	0	0	0	PVC
838	P-67	J-62	J-63	99.00	300	110.00	-26.58	0.38	0.074	0.753	Asbestos Cement
839	P-310(2)	J-468 (Dummy)	J-467	69.00	300	120.00	-5.76	0.08	0.003	0.038	PVC
840	P-42	J-40	J-41	91.00	300	110.00	23.46	0.33	0.056	0.597	Asbestos Cement
841	P-123	J-109	J-119	21.00	200	120.00	0.28	0.01	0	0	PVC
842	P-12	J-12	J-13	89.00	300	120.00	-6.38	0.09	0.004	0.045	PVC
843	P-127	J-120	J-121	205.00	200	120.00	-0.41	0.01	0	0.002	PVC
844	P-39	J-37	J-38	110.00	300	110.00	-15.32	0.22	0.03	0.272	Asbestos Cement
845	P-198	J-76	J-189	340.00	250	120.00	0.11	0	0	0	PVC
846	P-21	J-20	J-21	62.00	300	110.00	-13.19	0.19	0.013	0.206	Asbestos Cement
847	P-252	J-236	J-237	2.00	400	120.00	0.00	0	0	0	PVC
848	P-81	J-76	J-77	87.00	250	120.00	-1.14	0.02	0	0.005	PVC
849	P-293	J-264	J-261	179.00	300	120.00	-5.86	0.08	0.006	0.039	PVC
850	P-236	J-224	J-225	82.00	300	120.00	0.00	0	0	0	PVC
851	P-69	Acheson Zone 3	J-65	123.00	300	110.00	-27.06	0.38	0.096	0.778	Asbestos Cement
852	P-65	J-55	J-61	151.00	300	110.00	-26.54	0.38	0.114	0.751	Asbestos Cement
853	P-4	J-4	J-5	124.00	300	120.00	-13.86	0.2	0.024	0.192	PVC
854	P-168	J-158	J-159	265.00	300	120.00	-2.08	0.03	0.002	0.006	PVC
855	P-56	J-52	J-53	70.00	300	110.00	-30.56	0.43	0.074	0.975	Asbestos Cement
856	P-139	J-132	J-133	106.00	200	120.00	0.13	0	0	0	PVC
857	P-36	J-34	J-35	61.00	300	110.00	-10.47	0.15	0.009	0.135	Asbestos Cement
858	P-103	J-99	J-100	157.00	200	120.00	0.21	0.01	0	0	PVC
859	P-98	J-94	J-95	59.00	200	120.00	0.59	0.02	0	0.004	PVC
860	P-116	Lakeshore	J-113	107.00	200	120.00	-0.02	0	0	0	PVC
861	P-305(2)	J-262	J-472	275.00	300	120.00	-1.05	0.01	0	0.002	PVC
863	P-165	J-156	J-152	29.00	200	120.00	0.14	0	0	0	PVC
864	P-221	J-210	J-211	208.00	300	120.00	-13.38	0.19	0.037	0.18	PVC
865	P-60	J-56 (Dummy)	J-57	133.00	300	110.00	-6.99	0.1	0.008	0.064	Asbestos Cement
866	P-244	J-135	J-232	151.00	200	120.00	-0.41	0.01	0	0.002	PVC
867	P-106	J-102	J-103	82.00	200	120.00	0.04	0	0	0	PVC
868	P-269	J-35	J-244	73.00	350	120.00	35.17	0.37	0.012	0.507	PVC
869	P-89	J-84	J-85	64.00	200	120.00	-0.68	0.02	0	0.005	PVC
870	P-25	J-24	J-25 (Dummy)	124.00	300	110.00	2.45	0.03	0.001	0.009	Asbestos Cement
871	P-23	J-22	J-23	47.00	300	110.00	2.49	0.04	0	0.01	Asbestos Cement
872	P-37	J-35	J-36	106.00	300	110.00	-15.32	0.22	0.029	0.272	Asbestos Cement
873	P-43	J-41	J-42	45.00	300	110.00	23.42	0.33	0.029	0.595	Asbestos Cement
874	P-19	J-18	J-19	89.00	300	110.00	-13.15	0.19	0.018	0.204	Asbestos Cement
876	P-77	J-70	J-73	144.00	200	120.00	-1.57	0.05	0.003	0.024	PVC
877	P-94	J-89	J-90	141.00	200	120.00	-1.26	0.04	0.002	0.016	PVC
878	P-260	J-240	J-241	2.00	600	120.00	0.00	0	0	0	PVC
879	P-267	J-239	PMP-105	2.00	600	120.00	0.00	0	0	0	PVC
880	P-297	J-243	OLD FIRE PUMP	4.00	500	120.00	0.00	0	0	0	PVC
881	P-253	J-237	J-238	2.00	400	120.00	0.00	0	0	0	PVC
882	P-186	J-176	J-177	48.00	200	120.00	0.46	0.01	0	0.003	PVC
883	P-86	J-81	J-82	220.00	200	120.00	0.22	0.01	0	0.001	PVC
884	P-274	J-246	J-247	370.00	300	120.00	13.38	0.19	0.066	0.18	PVC
885	P-214	J-203	J-204	29.00	300	120.00	-4.12	0.06	0.001	0.02	PVC
886	P-311(2)	J-467	J-466	82.00	300	120.00	-6.24	0.09	0.004	0.044	PVC
887	P-194	J-184	J-185	66.00	300	120.00	0.93	0.01	0	0.001	PVC
888	P-40	J-38	J-39	44.00	300	110.00	-15.36	0.22	0.012	0.271	Asbestos Cement
889	P-199	J-189	J-190	318.00	300	120.00	-4.52	0.06	0.008	0.024	PVC
890	P-162	J-153	J-154	39.00	200	120.00	0.12	0	0	0	PVC
891	P-82	J-77	J-78	43.00	250	120.00	-1.14	0.02	0	0.003	PVC
892	P-54	J-35	J-51	62.00	300	110.00	-30.32	0.43	0.06	0.96	Asbestos Cement
893	P-57	J-53	J-54	91.00	300	110.00	-30.68	0.43	0.089	0.981	Asbestos Cement
894	P-99	J-95	J-96	66.00	200	120.00	0.57	0.02	0	0.004	PVC
895	P-166	J-147	J-157	23.00	200	120.00	-2.07	0.07	0.001	0.041	PVC
896	P-222	J-211	J-212	47.00	300	120.00	0.00	0	0	0	PVC
897	P-245	J-133	J-233	76.00	200	120.00	0.06	0	0	0	PVC
898	P-1	J-1	J-2	158.00	300	120.00	-13.06	0.18	0.029	0.172	PVC
899	P-90	J-85	J-86	140.00	200	120.00	-1.11	0.04	0.002	0.013	PVC
900	P-13	J-13	J-14	30.00	300	110.00	6.76	0.1	0.003	0.059	Asbestos Cement
901	P-48	J-46	J-47	139.00	300	110.00	17.32	0.24	0.048	0.34	Asbestos Cement
903	P-155	J-146	J-147	23.00	200	120.00	-0.83	0.03	0	0.008	PVC
904	P-302(2)	J-259	J-461	628.00	300	120.00	29.12	0.41	0.257	0.759	PVC
905	P-240	J-208	J-230	357.00	300	120.00	-0.07	0	0	0	PVC
906	P-187	J-168	J-178	363.00	350	120.00	1.42	0.01	0.001	0.001	PVC
907	P-262	J-242	J-243	2.00	600	120.00	0.00	0	0	0	PVC
908	P-275	J-247	J-248	75.00	300	120.00	13.38	0.19	0.014	0.18	PVC
909	P-312(2)	J-466	J-465	94.00	300	120.00	-6.24	0.09	0.004	0.044	PVC
910	P-153	J-145	J-132	114.00	200	120.00	0.16	0.01	0	0.001	PVC
911	P-62	J-58	J-59	127.00	300	110.00	34.25	0.48	0.154	1.203	Asbestos Cement
912	P-163	J-154	J-155	61.00	200	120.00	0.08	0	0	0	PVC
913	P-208	J-198	J-199	68.00	300	120.00	0.04	0	0	0	PVC
914	P-100	J-96	J-97	141.00	200	120.00	0.46	0.01	0	0.002	PVC
915	P-91	J-86	J-87	166.00	200	120.00	-1.17	0.04	0.002	0.014	PVC
916	P-49	J-47	J-26	98.00	300	110.00	17.28	0.24	0.032	0.339	Asbestos Cement
917	P-314(2)	J-464	J-230	207.00	300	120.00	0.11	0	0	0	PVC
918	P-242	J-229	J-230	45.00	250	120.00	-0.04	0	0	0	PVC
919	P-6	J-7	J-6	24.00	200	120.00	0.04	0	0	0	PVC
920	P-263	J-243	PMP-101	2.00	600	120.00	0.00	0	0	0	PVC
921	P-2	J-2	J-3	142.00	300	120.00	-13.50	0.19	0.025	0.183	PVC
922	P-180	J-171	J-172	67.00	200	120.00	0.79	0.03	0	0.007	PVC
923	P-50	J-44	J-48	97.00	300	110.00	5.94	0.08	0.005	0.047	Asbestos Cement
924	P-169	J-159	J-160	124.00	300	120.00	-2.08	0.03	0.001	0.005	PVC
925	P-315(2)	J-465	J-464	45.00	300	120.00	-6.24	0.09	0.002	0.044	PVC
926	P-87	J-82	J-83	149.00	200	120.00	-0.63	0.02	0.001	0.004	PVC
927	P-51	J-48	J-49	123.00	300	110.00	5.94	0.08	0.006	0.047	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
928	P-170	J-160	J-161	104.00	300	120.00	-1.94	0.03	0.001	0.005	PVC
929	P-179	J-163	J-171	113.00	200	120.00	0.84	0.03	0.001	0.008	PVC
930	P-113	J-231	J-125	185.00	200	120.00	-0.04	0	0	0	PVC
931	P-203	J-125	J-209	180.00	200	120.00	0.04	0	0	0	PVC
932	P-204	J-125	J-214	107.00	200	120.00	0.00	0	0	0	PVC
933	P-205	J-193	J-215	201.00	300	120.00	4.31	0.06	0.004	0.022	PVC
934	P-219	J-26	J-216	167.00	200	110.00	-6.12	0.19	0.059	0.357	Asbestos Cement
935	P-303	J-193	J-274	39.00	300	120.00	-4.53	0.06	0.001	0.023	PVC
936	P-305	J-274	J-194	198.00	200	120.00	0.04	0	0	0	PVC
937	P-306	J-189	J-274	249.00	300	120.00	4.57	0.06	0.006	0.025	PVC
938	P-307	J-228	J-275	314.00	300	120.00	-0.83	0.01	0	0.001	PVC
940	P-310	J-188	J-276	110.00	300	120.00	0.36	0.01	0	0.001	PVC
941	P-311	J-276	J-182	265.00	300	120.00	-0.89	0.01	0	0.001	PVC
942	P-312	J-276	J-277	170.00	300	120.00	1.21	0.02	0	0.002	PVC
944	P-314	J-278	J-279 (Dummy)	172.00	300	120.00	-63.16	0.89	0.565	3.182	PVC
945	P-315	J-279 (Dummy)	J-280	255.00	300	120.00	-65.89	0.93	0.786	3.441	PVC
946	P-413	J-369	J-9	217.00	300	120.00	-4.55	0.06	0.004	0.024	PVC
947	P-463	J-119	J-413	36.00	150	120.00	0.16	0.01	0	0.002	PVC
948	P-464	J-413	J-118	118.00	200	120.00	0.16	0.01	0	0	PVC
949	P-466	J-414	J-263	264.00	300	120.00	4.50	0.06	0.005	0.024	PVC
950	P-467	J-8	J-415	209.00	300	120.00	-8.19	0.12	0.015	0.072	PVC
952	P-469	J-262	J-416	50.00	300	120.00	4.54	0.06	0.002	0.024	PVC
953	P-470	J-416	J-414	71.00	300	120.00	4.54	0.06	0.002	0.025	PVC
954	P-471	J-244	J-417	188.00	600	120.00	35.17	0.12	0.013	0.037	HDPE
955	P-472	J-417	J-418	70.00	600	120.00	22.08	0.08	0.001	0.016	PVC
956	P-483	J-216	J-426	467.00	200	110.00	-6.12	0.19	0.17	0.357	Asbestos Cement
957	P-485	J-427	J-66	310.00	200	110.00	-13.58	0.43	0.476	1.564	Asbestos Cement
961	P-494	J-238	PRV-4	3.00	350	120.00	0.00	0	0	0	PVC
962	P-495	PRV-4	J-244	3.00	350	120.00	0.00	0	0	0	PVC
963	P-496	PRV-5	J-280	37.00	400	120.00	257.23	2.05	1.297	10.56	PVC
965	P-500	J-433	J-427	244.00	200	110.00	-13.18	0.42	0.361	1.479	Asbestos Cement
966	P-501	J-40	J-433	147.00	300	110.00	-7.02	0.1	0.009	0.064	Asbestos Cement
967	P-502	J-225	J-317	106.00	300	120.00	0.00	0	0	0	PVC
968	P-529	J-461	J-542	318.00	300	120.00	29.00	0.41	0.095	0.753	PVC
971	P-536	J-202	J-183	115.00	350	120.00	-2.12	0.02	0	0.003	PVC
972	P-597	J-232	J-455	163.00	200	120.00	-0.03	0	0	0	PVC
973	P-598	J-137	J-456	53.00	200	120.00	-0.51	0.02	0	0.003	PVC
974	P-599	J-456	J-457	147.00	200	120.00	0.09	0	0	0	PVC
975	P-600	J-457	J-458	105.00	200	120.00	0.01	0	0	0	PVC
976	P-601	J-458	J-459	75.00	200	120.00	0.00	0	0	0	PVC
977	P-602	J-457	J-460	112.00	200	120.00	-0.29	0.01	0	0.001	PVC
978	P-603	J-457	J-462	99.00	200	120.00	0.34	0.01	0	0.002	PVC
979	P-604	J-462	J-473	83.00	200	120.00	0.33	0.01	0	0.001	PVC
982	P-607	J-263	J-261	199.00	300	120.00	3.54	0.05	0.003	0.016	PVC
983	P-608	J-263	J-474	104.00	300	120.00	0.96	0.01	0	0.001	PVC
984	P-609	J-155	J-475	48.00	200	120.00	0.05	0	0	0	PVC
985	P-610	J-475	J-476	99.00	200	120.00	0.05	0	0	0	PVC
986	P-611	J-476	J-477	118.00	200	120.00	0.05	0	0	0	PVC
987	P-612	J-477	J-478	106.00	200	120.00	0.00	0	0	0	PVC
988	P-613	J-478	J-479	100.00	200	120.00	-0.02	0	0	0	PVC
989	P-614	J-479	J-480	106.00	200	120.00	-0.45	0.01	0	0.002	PVC
990	P-615	J-478	Country Squire	134.00	200	120.00	0.00	0	0	0	PVC
991	P-616	Country Squire	J-482	51.00	200	120.00	0.00	0	0	0	PVC
992	P-617	J-483	J-88	77.00	200	120.00	0.00	0	0	0	PVC
993	P-618	J-255	J-484	74.00	300	120.00	-1.62	0.02	0	0.003	PVC
994	P-619	J-484	J-485	90.00	300	120.00	-1.64	0.02	0	0.004	PVC
995	P-620	J-485	Greenbriar	149.00	300	120.00	-1.65	0.02	0	0.004	PVC
996	P-621	Greenbriar	J-487	95.00	300	120.00	-1.71	0.02	0.001	0.004	PVC
997	P-622	J-487	J-488	146.00	300	120.00	-1.72	0.02	0	0.004	PVC
998	P-623	J-488	J-489	137.00	300	120.00	-1.72	0.02	0.001	0.004	PVC
999	P-624	J-489	J-490	161.00	300	120.00	1.83	0.03	0.001	0.005	PVC
1000	P-625	J-490	J-491	59.00	300	120.00	1.67	0.02	0	0.004	PVC
1001	P-626	J-472	J-492	200.00	300	120.00	1.98	0.03	0.001	0.005	PVC
1003	P-628	J-493	J-494	221.00	300	120.00	2.73	0.04	0.003	0.01	PVC
1004	P-631	J-496	J-701	290.00	300	120.00	2.73	0.04	0.001	0.01	PVC
1006	P-633	J-494	J-496	395.00	300	120.00	2.73	0.04	0.002	0.009	PVC
1007	P-634	J-256	J-499	159.00	200	120.00	0.04	0	0	0	HDPE
1008	P-635	J-125	J-500	208.00	200	120.00	-0.14	0	0	0	PVC
1009	P-636	J-500	J-193	123.00	200	120.00	-0.18	0.01	0	0.001	PVC
1012	P-639	J-75	J-502	104.00	200	120.00	-0.66	0.02	0.001	0.005	PVC
1013	P-640	J-502	J-503	95.00	200	120.00	-0.69	0.02	0.001	0.005	PVC
1014	P-641	J-503	J-504	118.00	200	120.00	-0.73	0.02	0.001	0.006	PVC
1015	P-642	J-504	J-505	103.00	200	120.00	-0.77	0.02	0.001	0.007	PVC
1016	P-643	J-75	J-506	84.00	200	120.00	0.08	0	0	0	PVC
1017	P-644	J-506	J-507	147.00	200	120.00	0.04	0	0	0	PVC
1018	P-533	J-426	J-433	198.00	200	110.00	-6.12	0.19	0.073	0.357	Asbestos Cement
1021	P-439	J-513	J-167	152.00	300	120.00	-11.64	0.16	0.017	0.139	HDPE
1023	P-441	J-148	J-338	252.00	200	120.00	0.25	0.01	0	0.001	PVC
1024	P-443	J-339	J-232	126.00	200	120.00	0.39	0.01	0	0.002	PVC
1025	P-445	J-340	J-341	74.00	200	120.00	0.03	0	0	0	PVC
1026	P-446	J-338	J-342	79.00	200	120.00	0.22	0.01	0	0	PVC
1027	P-447	J-342	J-340	138.00	200	120.00	0.02	0	0	0	PVC
1028	P-448	J-342	J-343	127.00	200	120.00	0.21	0.01	0	0.001	PVC
1029	P-449	J-343	J-344	109.00	200	120.00	0.02	0	0	0	PVC
1030	P-450	J-344	J-345	88.00	200	120.00	0.02	0	0	0	PVC
1031	P-451	J-345	J-346	107.00	200	120.00	-0.35	0.01	0	0.001	PVC
1032	P-452	J-255	J-347	531.00	300	120.00	2.60	0.04	0.004	0.009	HDPE
1034	P-454	J-347	J-348	255.00	200	120.00	0.46	0.01	0.001	0.002	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1036	P-456	J-349	J-350	241.00	250	120.00	0.29	0.01	0	0	PVC
1037	P-457	J-350	J-351	254.00	250	120.00	-1.28	0.03	0.001	0.006	PVC
1038	P-458	J-351	J-352	307.00	250	120.00	-1.67	0.03	0.002	0.009	PVC
1039	P-459	J-352	J-353	190.00	250	120.00	-1.67	0.03	0.001	0.009	PVC
1040	P-460	J-353	J-491	195.00	250	120.00	-1.67	0.03	0.002	0.009	PVC
1042	P-462	J-354	J-355	173.00	300	120.00	10.02	0.14	0.018	0.105	PVC
1043	P-465	J-355	J-356	310.00	300	120.00	7.08	0.1	0.017	0.055	PVC
1044	P-473	J-356	J-357	485.00	300	120.00	7.08	0.1	0.027	0.055	PVC
1045	P-474	J-357	J-358	563.00	300	120.00	7.08	0.1	0.025	0.055	PVC
1048	P-477	J-621	J-361	826.00	300	120.00	14.80	0.21	0.155	0.217	PVC
1049	P-479	J-362	J-363	800.00	300	120.00	6.29	0.09	0.033	0.044	PVC
1052	P-486	J-252	J-367	354.00	300	120.00	2.54	0.04	0.002	0.008	PVC
1053	P-487	J-367	J-368	382.00	300	120.00	1.67	0.02	0.002	0.004	PVC
1054	P-488	J-368	J-370	1,171.00	300	120.00	0.60	0.01	0.001	0.001	PVC
1057	P-499	J-511	J-372	586.00	250	120.00	-2.86	0.06	0.004	0.025	PVC
1058	P-504	J-176	J-373	101.00	200	120.00	-0.64	0.02	0	0.004	PVC
1059	P-505	J-373	J-374	144.00	200	120.00	-0.64	0.02	0.001	0.005	PVC
1060	P-506	J-374	J-375	147.00	200	120.00	-0.72	0.02	0.001	0.006	PVC
1061	P-507	J-375	J-164	158.00	200	120.00	-0.72	0.02	0.001	0.006	PVC
1062	P-508	J-165	J-376	357.00	200	120.00	4.76	0.15	0.064	0.191	PVC
1063	P-510	J-377	J-378	401.00	200	120.00	1.93	0.06	0.015	0.036	PVC
1064	P-512	J-379	J-380	394.00	200	120.00	0.31	0.01	0	0.001	PVC
1065	P-513	J-380	J-460	90.00	300	120.00	0.31	0	0	0	PVC
1066	P-514	J-91	J-381	67.00	200	120.00	-1.33	0.04	0.001	0.019	PVC
1067	P-515	J-381	J-382	353.00	200	120.00	-1.33	0.04	0.006	0.018	PVC
1069	P-517	J-473	J-104	80.00	200	120.00	0.33	0.01	0	0.002	PVC
1071	P-522	J-359	J-365	1,367.00	300	120.00	11.98	0.17	0.178	0.147	PVC
1073	P-524	J-384	J-385	986.00	350	120.00	-8.10	0.08	0.026	0.033	PVC
1075	P-527	J-387	J-280	912.00	350	120.00	-88.77	0.92	2.556	2.821	PVC
1077	P-530	J-389	J-669	661.00	250	120.00	-2.13	0.04	0.006	0.014	PVC
1082	P-542	J-679	J-394	859.00	350	120.00	2.85	0.03	0.002	0.005	PVC
1084	P-544	J-396	J-397	819.00	300	120.00	8.52	0.12	0.064	0.078	PVC
1085	P-545	J-397	J-398	906.00	300	120.00	4.03	0.06	0.016	0.02	PVC
1087	P-548	J-400	Supreme Steel	629.00	300	120.00	-6.81	0.1	0.023	0.051	PVC
1091	P-556	J-406	J-407	798.00	300	120.00	13.75	0.19	0.153	0.189	PVC
1092	P-557	J-407	J-408	847.00	300	120.00	8.43	0.12	0.072	0.076	PVC
1093	P-558	J-408	J-409	883.00	300	120.00	2.29	0.03	0.006	0.007	PVC
1095	P-560	J-410	J-411	839.00	300	120.00	0.07	0	0	0	PVC
1097	P-567	J-421	J-626	809.00	300	120.00	7.97	0.11	0.055	0.069	PVC
1099	P-569	J-420	J-716	756.00	300	120.00	21.12	0.3	0.169	0.419	PVC
1103	P-573	J-424	J-425	398.00	300	120.00	-1.93	0.03	0.001	0.005	PVC
1107	P-577	J-206	J-224	304.00	322	120.00	3.31	0.04	0.003	0.01	HDPE
1108	P-580	J-173	J-429	273.00	200	120.00	0.32	0.01	0	0.001	PVC
1109	P-581	J-429	J-160	203.00	200	120.00	0.14	0	0	0	PVC
1110	P-582	J-153	J-430	277.00	200	120.00	-0.01	0	0	0	PVC
1111	P-583	J-430	J-480	334.00	200	120.00	-0.23	0.01	0	0.001	PVC
1112	P-584	J-480	J-431	297.00	200	120.00	-0.71	0.02	0.002	0.006	PVC
1113	P-585	J-431	J-170	268.00	200	120.00	-0.72	0.02	0.001	0.006	PVC
1116	P-588	J-435	J-436	431.00	200	120.00	0.04	0	0	0	PVC
1117	P-589	J-436	J-455	232.00	200	120.00	0.04	0	0	0	PVC
1118	P-590	J-340	J-437	148.00	200	120.00	-0.15	0	0	0	PVC
1119	P-591	J-437	J-339	102.00	200	120.00	0.44	0.01	0	0.002	PVC
1120	P-593	J-438	J-147	134.00	300	120.00	-0.70	0.01	0	0.001	PVC
1124	P-630	J-505	J-82	489.00	200	120.00	-0.83	0.03	0.004	0.007	PVC
1127	P-647	J-622	J-406	1,537.00	300	120.00	18.24	0.26	0.279	0.319	PVC
1130	P-652	J-365	J-440	499.00	300	120.00	-2.40	0.03	0.001	0.007	PVC
1131	P-653	J-361	J-441	378.00	300	120.00	13.02	0.18	0.124	0.171	PVC
1132	P-654	J-441	J-362	813.00	300	120.00	7.98	0.11	0.056	0.069	PVC
1133	P-655	J-440	J-441	555.00	300	120.00	-2.40	0.03	0.004	0.007	PVC
1134	P-661	PRV-14	J-621	37.00	300	120.00	28.91	0.41	0.042	0.748	PVC
1137	P-664	J-385	PRV-16	32.00	350	120.00	-15.01	0.16	0.024	0.105	PVC
1138	P-665	PRV-16	J-386	969.00	350	120.00	-15.01	0.16	0.09	0.105	PVC
1140	P-671	J-379	J-93	481.00	200	120.00	0.40	0.01	0.001	0.002	PVC
1141	P-676	J-367	J-442	771.00	300	120.00	0.79	0.01	0	0.001	PVC
1143	P-678	J-511	J-510	93.00	250	120.00	1.37	0.03	0.002	0.006	PVC
1149	P-684	J-509	J-444	384.00	300	120.00	-23.16	0.33	0.222	0.497	PVC
1150	P-685	J-444	J-403	378.00	300	120.00	6.70	0.09	0.025	0.05	PVC
1153	P-688	J-401	J-623	837	300	120	8.15	0.12	0.05	0.072	PVC
1155	P-690	J-423	J-407	831	300	120	-0.83	0.01	0.001	0.001	PVC
1157	P-692	J-365	J-363	807	300	120	9.92	0.14	0.084	0.103	PVC
1158	P-693	J-169	J-388	745	300	120	-5.84	0.08	0.019	0.039	PVC
1159	P-694	J-370	J-445	752	300	120	-0.56	0.01	0	0	PVC
1169	P-705	J-449	J-208	166	300	120	-5.95	0.08	0.006	0.04	PVC
1171	P-707	Supreme Steel	J-450	178	410	120	9.78	0.07	0.005	0.022	HDPE
1172	P-708	J-450	J-1	334	400	120	9.78	0.08	0.008	0.025	PVC
1174	P-710	J-343	J-452	68	200	120	0.1	0	0	0	PVC
1175	P-711	J-437	J-453	67	200	120	-0.59	0.02	0	0.004	PVC
1176	P-712	J-453	J-438	139	300	120	-0.68	0.01	0	0.001	PVC
1180	P-717	J-399	J-463	398	300	120	4.27	0.06	0.009	0.022	PVC
1181	P-718	J-463	J-400	489	300	120	9.04	0.13	0.052	0.087	PVC
1185	P-722	J-607	J-463	437	300	120	6.62	0.09	0.021	0.049	PVC
1186	P-723	J-418	J-495	222	600	120	22.08	0.08	0.005	0.016	PVC
1190	P-727	J-514	J-417	673	300	120	-13.09	0.19	0.066	0.173	PVC
1191	P-728	J-402	J-509	260	300	120	27.58	0.39	0.445	0.686	PVC
1192	P-729	J-509	J-412	472	400	120	48.28	0.38	0.114	0.476	PVC
1193	P-730	R-4	PRV-18	2	300	120	0	0	0	0	PVC
1194	P-731	PRV-18	J-454	2	300	120	0	0	0	0	PVC
1203	P-735	J-449	J-515	810	250	120	1.61	0.03	0.003	0.009	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1206	P-737	J-425	J-516	666	300	120	-1.93	0.03	0.001	0.005	PVC
1211	P-740	J-424	J-518	0	300	120	0	0	0	0	PVC
1213	P-741	J-390	J-519	897	400	120	0	0	0	0	PVC
1216	P-743	J-373	J-520	0	200	120	0	0	0	0	PVC
1218	P-744	J-348	J-521	448	200	120	0.33	0.01	0	0.001	PVC
1219	P-745	J-521	J-349	448	200	120	0.33	0.01	0	0.001	PVC
1222	P-746	J-521	J-523	0	200	120	0	0	0	0	PVC
1224	P-747	J-349	J-524	0	250	120	0	0	0	0	PVC
1226	P-748	J-351	J-525	0	200	120	0	0	0	0	PVC
1248	P-754	J-495	J-529	560	600	120	11.02	0.04	0	0.004	PVC
1251	P-756	J-529	J-530	0	600	120	11.02	0.04	0.001	0.005	PVC
1253	P-757	J-530	J-531	0	600	120	11.02	0.04	0.001	0.004	PVC
1255	P-758	J-531	J-532	0	600	120	11.02	0.04	0	0.004	PVC
1256	P-759	J-532	J-390	0	600	120	11.02	0.04	0.001	0.005	PVC
1257	P-760	J-390	J-495	0	600	120	-11.06	0.04	0.003	0.004	PVC
1262	P-762	PRV-A	J-535	185	300	120	16.93	0.24	0.02	0.278	PVC
1263	P-763	J-535	Panattoni	185	300	120	6.92	0.1	0.01	0.053	PVC
1269	P-767	J-536	J-537	0	300	120	9.59	0.14	0.037	0.097	PVC
1273	P-769	J-537	J-539	0	300	120	1.65	0.02	0.001	0.004	PVC
1275	P-770	J-536	J-540	0	300	120	0	0	0	0	PVC
1277	P-771	J-541	J-536	0	300	120	5.03	0.07	0.005	0.03	PVC
1280	P-773	J-542	PRV-A	0	300	120	16.93	0.24	0.028	0.278	PVC
1287	P-778	J-547	J-541	0	300	120	5.03	0.07	0.016	0.029	PVC
1290	P-779	J-537	J-546	0	300	120	7.86	0.11	0.023	0.067	PVC
1294	P-782	J-536	J-547	0	300	120	-7.04	0.1	0.021	0.055	PVC
1295	P-783	J-547	J-542	0	350	120	-12.07	0.13	0.027	0.07	PVC
1304	P-789	J-1	J-550	0	350	120	22.11	0.23	0.047	0.215	PVC
1309	P-792	J-82	J-552	0	200	120	0.01	0	0	0	PVC
1311	P-793	J-345	J-553	288	200	120	0.3	0.01	0	0.001	PVC
1312	P-794	J-553	J-435	288	200	120	0.3	0.01	0	0.001	PVC
1314	P-795	J-197	J-554	247	300	120	-5.13	0.07	0.005	0.03	PVC
1315	P-796	J-554	J-200	247	300	120	-6.46	0.09	0.004	0.047	PVC
1316	P-797	J-261	J-554	0	200	120	-1.33	0.04	0.013	0.018	PVC
1318	P-798	J-261	J-555	401	300	120	-0.99	0.01	0	0.002	PVC
1319	P-799	J-555	J-196	401	300	120	-4.01	0.06	0.005	0.019	PVC
1324	P-801	J-555	J-558	0	200	120	0	0	0	0	PVC
1325	P-802	J-558	J-556	0	200	120	0	0	0	0	PVC
1326	P-803	J-557	J-558	0	200	120	0	0	0	0	PVC
1331	P-806	J-168	J-560	1,219	350	120	-3.75	0.04	0.004	0.008	PVC
1334	P-808	J-246	J-561	359	322	120	-95.3	1.17	0.885	4.829	HDPE
1335	P-809	J-561	J-278	359	300	120	-63.16	0.89	0.546	3.182	PVC
1337	P-810	J-277	J-562	362	300	120	2.57	0.04	0.002	0.008	PVC
1338	P-811	J-562	J-451	362	300	120	2.53	0.04	0.001	0.008	PVC
1340	P-812	J-451	J-563	0	300	120	2.2	0.03	0.002	0.006	PVC
1343	P-814	J-563	J-564	0	300	120	1.12	0.02	0.001	0.002	PVC
1344	P-815	J-564	J-167	0	300	120	1.12	0.02	0	0.002	PVC
1346	P-816	J-275	J-565	618	300	120	0.95	0.01	0	0.001	PVC
1347	P-817	J-565	J-180 (Dummy)	618	300	120	4.11	0.06	0.008	0.02	PVC
1349	P-818	J-275	J-566	785	300	120	-1.82	0.03	0.001	0.004	PVC
1350	P-819	J-614	J-388	785	300	120	-5.06	0.07	0.019	0.03	PVC
1352	P-820	J-566	J-567	0	300	120	0.04	0	0	0	PVC
1354	P-821	J-262	J-568	797	300	120	-3.5	0.05	0.007	0.015	PVC
1355	P-822	J-568	J-449	797	300	120	-3.5	0.05	0.006	0.015	PVC
1357	P-823	Panattoni	J-569	726	300	120	6.35	0.09	0.004	0.045	PVC
1361	P-826	J-570	J-464	726	300	120	6.35	0.09	0.01	0.045	PVC
1364	P-828	J-571	J-570	726	300	120	6.35	0.09	0.005	0.045	PVC
1368	P-830	J-573	Supreme Steel	1,001	400	120	16.59	0.13	0.011	0.066	PVC
1374	P-834	J-575	J-369	589	300	120	-4.47	0.06	0.004	0.024	PVC
1376	P-835	J-424	J-576	899	400	120	23.47	0.19	0.031	0.125	PVC
1386	P-837	J-454	J-577	0	300	120	21.5	0.3	0.037	0.432	PVC
1388	P-838	J-569	J-578	726	300	120	6.35	0.09	0.012	0.045	PVC
1389	P-839	J-578	J-571	726	300	120	6.35	0.09	0.003	0.046	PVC
1391	P-840	J-497	J-579	41	300	120	1.11	0.02	0	0.002	PVC
1392	P-841	J-579	J-498	41	300	120	0	0	0	0	PVC
1396	P-842	J-579	J-582	959	300	120	1.11	0.02	0	0.002	PVC
1397	P-843	J-637	J-358	959	300	120	-2.32	0.03	0.003	0.007	PVC
1402	P-845	J-403	J-585	783	300	120	6.7	0.09	0.016	0.05	PVC
1403	P-846	J-585	J-622	783	300	120	3.99	0.06	0.008	0.019	PVC
1406	P-848	J-576	J-586	899	400	120	21.66	0.17	0.031	0.108	PVC
1411	P-851	J-280	J-588	1,451	400	120	101.73	0.81	0.924	1.895	PVC
1423	P-855	J-422	J-590	905	400	120	5.15	0.04	0.003	0.008	PVC
1424	P-856	J-590	J-411	905	300	120	1.21	0.02	0.001	0.002	PVC
1426	P-857	PRV-15	J-591	974	350	120	-14.82	0.15	0.034	0.102	PVC
1427	P-858	J-591	J-387	974	350	120	-23.71	0.25	0.133	0.245	PVC
1430	P-860	J-592	J-577	0	300	120	-21.5	0.3	0.077	0.433	PVC
1438	P-864	J-595	J-596	0	300	120	-4.84	0.07	0.017	0.027	PVC
1443	P-867	J-596	J-598	0	300	120	-9	0.13	0.056	0.086	PVC
1444	P-868	J-598	J-400	0	300	120	-13.32	0.19	0.153	0.178	PVC
1446	P-869	J-592	J-599	0	300	120	-0.95	0.01	0	0.001	PVC
1447	P-870	J-599	J-595	0	300	120	-0.95	0.01	0.001	0.001	PVC
1450	P-871	J-371	J-601	444	300	120	-0.83	0.01	0	0.001	PVC
1451	P-872	J-601	J-350	444	300	120	-1.57	0.02	0.001	0.003	PVC
1453	P-873	J-347	J-602	818	300	120	1.92	0.03	0.003	0.005	HDPE
1454	P-874	J-602	J-252	818	300	120	1.92	0.03	0.001	0.005	HDPE
1460	P-878	J-489	J-604	428	300	120	-3.57	0.05	0.003	0.016	PVC
1461	P-879	J-604	J-215	428	300	120	-4.31	0.06	0.005	0.022	PVC
1463	P-880	J-190	J-605	0	300	120	1.91	0.03	0.003	0.005	PVC
1467	P-882	J-561	J-606	0	300	120	-32.14	0.45	0.429	0.911	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1468	P-883	J-606	J-588	0	300	120	-34.63	0.49	0.544	1.045	PVC
1474	P-884	J-481	J-607	0	300	120	6.62	0.09	0.018	0.049	PVC
1476	P-885	J-508	J-608	503	300	120	24.66	0.35	0.086	0.557	PVC
1479	P-887	J-608	J-609	0	300	120	0	0	0	0	PVC
1481	P-888	J-391 (Dummy)	J-610	624	400	120	13.54	0.11	0.019	0.045	PVC
1482	P-889	J-610	J-508	624	300	120	13.42	0.19	0.038	0.181	PVC
1484	P-890	J-415	J-611	176	300	120	-8.19	0.12	0.008	0.072	PVC
1485	P-891	J-611	J-9	176	300	120	-8.19	0.12	0.001	0.072	PVC
1501	P-901	J-613	J-384	1,219	350	120	-7.1	0.07	0.01	0.026	PVC
1505	P-904	J-565	J-614	0	300	120	-3.16	0.04	0.002	0.012	PVC
1506	P-905	J-614	J-566	0	300	120	1.9	0.03	0.001	0.005	PVC
1528	P-914	J-619	J-671	1,187	350	120	0.49	0.01	0	0	PVC
1530	P-915	J-584	J-620	0	300	120	22.84	0.32	0.099	0.484	PVC
1531	P-916	J-620	J-585	0	300	120	22.84	0.32	0.311	0.484	PVC
1540	P-921	J-359	J-621	0	300	120	-14.11	0.2	0.107	0.198	PVC
1543	P-923	J-420	J-585	754	300	120	-25.54	0.36	0.264	0.595	PVC
1544	P-924	J-622	J-404	754	300	120	-14.25	0.2	0.057	0.202	PVC
1546	P-925	J-398	J-623	789	300	120	0.61	0.01	0	0.001	PVC
1547	P-926	J-623	J-399	789	300	120	8.76	0.12	0.034	0.082	PVC
1549	P-927	J-610	J-439	356	300	120	-0.65	0.01	0	0.001	PVC
1553	P-929	J-412	J-626	720	400	120	46.18	0.37	0.22	0.439	PVC
1554	P-930	J-626	J-422	720	400	120	5.15	0.04	0.001	0.008	PVC
1558	P-932	J-634	J-401	1,163	300	120	12.53	0.18	0.087	0.159	PVC
1560	P-933	J-508	J-629	1,206	400	120	-6.87	0.05	0.006	0.013	PVC
1561	P-934	J-629	J-628	1,206	400	120	-6.87	0.05	0.005	0.013	PVC
1564	P-935	J-395	J-631	803	350	120	-0.41	0	0	0	PVC
1565	P-936	J-631	J-396	803	300	120	12.22	0.17	0.06	0.152	PVC
1574	P-941	J-354	J-535	0	300	120	-10.02	0.14	0.039	0.105	PVC
1580	P-944	J-439	J-624	0	300	120	-2.36	0.03	0.003	0.007	PVC
1605	P-946	J-493	J-632	0	300	120	-2.94	0.04	0.001	0.011	PVC
1606	P-947	J-632	J-355	0	300	120	-2.94	0.04	0.006	0.011	PVC
1613	P-949	J-382	PRV-24	465	200	120	-2.72	0.09	0.025	0.068	PVC
1614	P-950	PRV-24	J-377	465	200	120	-2.72	0.09	0.009	0.068	PVC
1615	P-951	J-376	J-377	0	200	120	4.65	0.15	0.062	0.183	PVC
1617	P-952	J-378	PRV-25	279	200	120	1.31	0.04	0.003	0.017	PVC
1618	P-953	PRV-25	J-379	279	200	120	1.31	0.04	0.002	0.018	PVC
1620	P-954	J-628	J-634	906	400	120	-6.87	0.05	0.002	0.013	PVC
1625	P-958	J-635	J-444	1,451	300	120	33.1	0.47	0.437	0.962	PVC
1626	P-959	J-402	J-635	0	300	120	-27.58	0.39	0.213	0.686	PVC
1636	P-965	J-637	J-359	594	300	120	2.32	0.03	0.002	0.007	PVC
1682	P-967	J-516	J-642	666	400	120	-1.93	0.02	0	0.002	PVC
1683	P-968	J-642	J-393	666	400	120	-1.93	0.02	0	0.001	PVC
1712	P-971	J-382	J-644	0	200	120	0.77	0.02	0.002	0.007	PVC
1743	P-540(2)	J-647	J-393	848	400	120	-28.86	0.23	0.072	0.184	PVC
1745	P-974	J-647	J-648 (Dummy)	0	300	120	7.12	0.1	0.02	0.056	PVC
1747	P-975	J-648 (Dummy)	J-649	0	300	120	4.39	0.06	0.004	0.023	PVC
1749	P-540(1)(1)	J-392	J-650	848	400	120	-17.75	0.14	0.022	0.075	PVC
1750	P-540(1)(2)	J-650	J-647	848	400	120	-21.74	0.17	0.017	0.109	PVC
1751	P-976	J-649	J-650	0	300	120	-3.99	0.06	0.006	0.019	PVC
1794	P-691(1)	J-166	J-651	105	350	120	-11.64	0.12	0.007	0.065	PVC
1795	P-691(2)	J-651	PRV-2i	1	76	120	-11.64	2.57	0.112	111.547	PVC
1797	P-438(1)	PRV-2i	J-652	1	76	120	-11.64	2.57	0.112	111.547	PVC
1798	P-438(2)	J-652	J-513	118	350	120	-11.64	0.12	0.008	0.066	PVC
1807	P-531(1)	J-207	J-653	39	300	120	-13.34	0.19	0.007	0.177	PVC
1808	P-531(2)	J-653	PRV-Bi	1	100	120	-13.34	1.7	0.038	37.728	PVC
1810	P-532(1)	PRV-Bi	J-654	1	100	120	-13.34	1.7	0.038	37.654	PVC
1811	P-532(2)	J-654	J-210	144	300	120	-13.34	0.19	0.026	0.179	PVC
1816	P-246(1)	J-190	J-655	43	300	120	-6.43	0.09	0.002	0.046	PVC
1817	P-246(2)	J-655	PRV-1i	1	76	120	-6.43	1.42	0.037	37.058	PVC
1819	P-247(1)	PRV-1i	J-656	1	76	120	-6.43	1.42	0.037	37.058	PVC
1820	P-247(2)	J-656	J-191	166	265	120	-6.43	0.12	0.014	0.085	HDPE
1825	P-605(1)	J-456	J-657	123	200	120	-0.6	0.02	0.001	0.004	PVC
1826	P-605(2)	J-657	PRV-21i	1	76	120	-0.6	0.13	0	0.446	PVC
1828	P-606(1)	PRV-21i	J-658	1	76	120	-0.6	0.13	0	0.446	PVC
1829	P-606(2)	J-658	J-140	37	200	120	-0.6	0.02	0	0.004	PVC
1834	P-131(1)	J-124	J-659	15	200	120	0	0	0	0	PVC
1835	P-131(2)	J-659	PRV-3i	1	50	120	0	0	0	0	PVC
1837	P-132(1)	PRV-3i	J-660	1	50	120	0	0	0	0	PVC
1838	P-132(2)	J-660	J-126	64	200	120	0	0	0	0	PVC
1858	P-989	J-83	J-662	0	200	120	0.04	0	0	0	PVC
1860	P-990	J-85	J-663	0	200	120	0.05	0	0	0	PVC
1861	P-991	J-277	J-181	0	300	120	-1.4	0.02	0.001	0.003	PVC
1883	P-854(1)	J-589	J-666	120	250	120	-3.39	0.07	0.004	0.035	PVC
1884	P-854(2)	J-666	PRV-19i	1	76.2	120	-3.39	0.74	0.011	11.162	PVC
1886	P-680(1)	PRV-19i	J-667	1	76.2	120	-3.39	0.74	0.011	11.237	PVC
1887	P-680(2)	J-667	J-165	61	300	120	-3.39	0.05	0.001	0.013	PVC
1931	P-790(1)	J-550	J-668	0	350	120	22.11	0.23	0.045	0.215	PVC
1932	P-790(2)	J-668	J-454	0	350	120	21.86	0.23	0.032	0.211	PVC
1934	P-662(1)	J-388	J-669	44	300	120	-10.89	0.15	0.015	0.122	PVC
1935	P-662(2)	J-669	PRV-15	44	350	120	-14.82	0.15	0.022	0.103	PVC
1937	P-995	J-169	J-670	0	250	120	-2.36	0.05	0.008	0.018	PVC
1939	P-844(1)	J-387	J-671	0	350	120	42.88	0.45	0.362	0.733	PVC
1940	P-844(2)	J-671	J-584	0	350	120	41.39	0.43	0.254	0.687	PVC
1942	P-913(1)	J-386	J-672	1,187	350	120	-12.64	0.13	0.031	0.076	PVC
1945	P-955(1)	J-634	J-673	906	350	120	-2.31	0.02	0.001	0.003	PVC
1948	P-996	J-674	J-672	0	350	120	23.75	0.25	0.089	0.246	PVC
1950	P-831(1)	J-481	J-675	1,001	400	120	17.4	0.14	0.017	0.072	PVC
1951	P-831(2)	J-675	J-574	1,001	400	120	16.9	0.13	0.014	0.068	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1953	P-886(1)	J-608	J-676	503	400	120	24.66	0.2	0.022	0.137	PVC
1954	P-886(2)	J-676	J-481	503	400	120	24.5	0.19	0.02	0.136	PVC
1960	P-955(2)(1)	J-673	J-681	906	350	120	-2.64	0.03	0.002	0.004	PVC
1961	P-955(2)(2)	J-681	J-631	906	350	120	1.49	0.02	0.001	0.001	PVC
1962	P-997	J-678	J-677	0	300	120	-6.98	0.1	0.017	0.054	PVC
1963	P-998	J-678	J-679	0	300	120	6.98	0.1	0.008	0.054	PVC
1964	P-999	J-681	J-679	0	350	120	-4.13	0.04	0.004	0.01	PVC
1966	P-490(1)	J-253	J-682	280	200	120	-0.64	0.02	0.001	0.005	PVC
1967	P-490(2)	J-682	J-371	280	200	120	-0.83	0.03	0.001	0.008	PVC
1973	P-1000	J-683	J-474	0	300	120	-0.96	0.01	0	0.001	PVC
1975	P-627(1)	J-492	J-685	233	300	120	1.9	0.03	0.001	0.005	PVC
1976	P-627(2)	J-685	J-493	233	300	120	0.78	0.01	0	0.001	PVC
1978	P-734(2)(1)	J-684	J-686	669	300	120	-0.43	0.01	0	0	PVC
1979	P-734(2)(2)	J-686	J-493	669	300	120	-0.99	0.01	0	0.001	PVC
1981	P-833(1)	J-508	J-687	589	300	120	-4.36	0.06	0.005	0.023	PVC
1982	P-833(2)	J-687	J-575	589	300	120	-4.47	0.06	0.005	0.024	PVC
1984	P-725(1)	J-9	J-688	642	300	120	-12.78	0.18	0.039	0.165	PVC
1985	P-725(2)	J-688	J-514	642	300	120	-12.93	0.18	0.079	0.169	PVC
1987	P-849(1)	J-586	J-689	899	400	120	21.54	0.17	0.011	0.108	PVC
1988	P-849(2)	J-689	J-391 (Dummy)	899	400	120	21.14	0.17	0.025	0.103	PVC
1990	P-428(1)	J-81	J-690	1,571	250	120	-1	0.02	0.001	0.004	PVC
1991	P-428(2)	J-690	J-510	1,571	250	120	-1.37	0.03	0.002	0.006	PVC
1993	P-853(1)	J-372	J-691	581	250	120	-2.86	0.06	0.006	0.025	PVC
1994	P-853(2)	J-691	J-589	581	250	120	-3.39	0.07	0.007	0.034	PVC
1996	P-286(1)	J-256	J-692	219	200	120	-0.08	0	0	0	HDPE
1997	P-286(2)	J-692	J-257	219	200	120	-0.27	0.01	0	0.001	HDPE
1999	P-76(1)	J-71	J-693	166	200	120	0.07	0	0	0	PVC
2000	P-76(2)	J-693	J-72	166	200	120	0.04	0	0	0	PVC
2003	P-988(2)	J-694	J-200	0	200	120	0.49	0.02	0.001	0.003	PVC
2005	P-988(1)(1)	J-515	J-695	0	200	120	1.41	0.04	0.003	0.02	PVC
2006	P-988(1)(2)	J-695	J-694	0	200	120	0.91	0.03	0.002	0.009	PVC
2010	P-956(1)	J-392	J-697	0	400	120	17.71	0.14	0.016	0.074	PVC
2011	P-956(2)	J-697	J-634	0	400	120	17.1	0.14	0.015	0.07	PVC
2013	P-832(1)	J-574	J-698	1,001	400	120	16.9	0.13	0.021	0.068	PVC
2014	P-832(2)	J-698	J-573	1,001	400	120	16.79	0.13	0.005	0.068	PVC
2016	P-571(1)	J-390	J-699	201	400	120	21.72	0.17	0.023	0.109	PVC
2017	P-571(2)	J-699	J-424	201	400	120	21.66	0.17	0.018	0.108	PVC
2021	P-518(1)	J-346	J-700	347	300	120	-0.35	0	0	0	PVC
2022	P-518(2)	J-700	J-479	347	300	120	-0.43	0.01	0	0	PVC
2026	P-948(2)	J-701	J-497	0	300	120	1.84	0.03	0.001	0.005	PVC
2028	P-957(1)	J-588	J-702	1,451	400	120	66.7	0.53	0.114	0.867	PVC
2029	P-957(2)	J-702	J-635	1,451	300	120	64.74	0.92	2.065	3.331	PVC
2031	P-1002	J-382	J-703	0	200	120	0.62	0.02	0.001	0.004	PVC
2034	P-881(1)	J-605	J-704	0	300	120	1.49	0.02	0.001	0.003	PVC
2035	P-881(2)	J-704	J-80 (Dummy)	0	300	120	1.49	0.02	0.001	0.003	PVC
2037	P-1003	J-595	J-617	0	300	120	0.83	0.01	0.001	0.001	PVC
2042	P-734(1)(2)	J-707	J-684	669	300	120	0	0	0	0	PVC
2043	P-1004	J-631	J-705	0	300	120	-11.51	0.16	0.114	0.136	PVC
2044	P-1005	J-717	J-706	0	300	120	7.31	0.1	0.032	0.059	PVC
2046	P-960(1)	J-716	J-708	0	300	120	9.5	0.13	0.038	0.095	PVC
2047	P-960(2)	J-708	J-717	0	300	120	9.5	0.13	0.047	0.095	PVC
2049	P-900(1)	J-560	J-709	1,219	350	120	-4.23	0.04	0.002	0.01	PVC
2050	P-900(2)	J-709	J-613	1,219	350	120	-4.23	0.04	0.001	0.01	PVC
2052	P-534(1)	J-389	J-710	547	350	120	-3.85	0.04	0.002	0.008	PVC
2053	P-534(2)	J-710	J-385	547	350	120	-3.85	0.04	0.004	0.009	PVC
2055	P-1006	J-386	J-711	0	350	120	-6.52	0.07	0.008	0.022	PVC
2056	P-1007	J-670	J-389	0	250	120	-3.29	0.07	0.02	0.033	PVC
2057	P-1008	J-624	J-391 (Dummy)	0	300	120	-4.88	0.07	0.016	0.028	PVC
2058	P-1009	J-677	J-649	0	300	120	-8.38	0.12	0.015	0.075	PVC
2060	P-1011	J-546	J-360	0	300	120	7.02	0.1	0.021	0.055	PVC
2061	P-1012	J-705	J-706	0	300	120	-11.51	0.16	0.373	0.136	PVC
2063	P-1013	J-706	J-712	0	300	120	-4.21	0.06	0.017	0.021	PVC
2065	P-913(2)(1)	J-672	J-713	1,187	350	120	9.09	0.09	0.014	0.041	PVC
2066	P-913(2)(2)	J-713	J-619	1,187	350	120	2.56	0.03	0.002	0.004	PVC
2067	P-1014	J-404	J-715	0	300	120	-18.54	0.26	0.171	0.329	PVC
2069	P-1015	J-711	J-713	0	350	120	-6.52	0.07	0.01	0.022	PVC
2072	P-1016(1)	J-584	J-715	0	300	120	18.54	0.26	0.189	0.329	PVC
2073	P-1016(2)	J-715	J-696	0	300	120	0	0	0	0	PVC
2088	P-649(1)	J-421	J-716	826	300	120	-7.97	0.11	0.028	0.069	PVC
2089	P-649(2)	J-716	J-423	826	300	120	3.65	0.05	0.007	0.016	PVC
2091	P-559(1)	J-409	J-717	823	300	120	0.14	0	0	0	PVC
2092	P-559(2)	J-717	J-410	823	300	120	2.33	0.03	0.003	0.007	PVC
2094	P-1018	J-387	J-718	0	350	120	22.18	0.23	0.142	0.216	PVC
2095	P-1019	J-718	J-591	0	350	120	-5.43	0.06	0.009	0.016	PVC
2096	P-1020	J-718	J-674	0	350	120	27.62	0.29	0.115	0.324	PVC
2097	P-1021	J-408	J-712	0	300	120	4.21	0.06	0.022	0.021	PVC
2101	P-1022	J-394	J-395	0	300	120	1.51	0.02	0.002	0.003	PVC
2109	P-1023	R-5	PRV-5	0	400	120	257.44	2.05	3.017	10.577	PVC
2112	P-1024	J-364	J-445	0	300	120	5.02	0.07	0.029	0.029	PVC
2114	P-480(1)	J-363	PRV-17	806	300	120	11.75	0.17	0.068	0.141	PVC
2115	P-480(2)	PRV-17	J-364	806	300	120	11.75	0.17	0.05	0.141	PVC
2129	P-1026	J-592	J-360	0	300	120	21.89	0.31	0.153	0.447	PVC
2130	P-1027	J-360	PRV-14	0	300	120	28.91	0.41	0.034	0.749	PVC
2144	P-687(2)	J-719	J-626	807	400	120	-49	0.39	0.16	0.49	PVC
2146	P-687(1)(1)	J-393	J-720	807	400	120	-49	0.39	0.116	0.49	PVC
2147	P-687(1)(2)	J-720	J-719	807	400	120	-49	0.39	0.104	0.49	PVC
2149	P-1029	J-111	J-721	0	200	120	0	0	0	0	PVC
2150	P-1030	J-168	J-167	0	350	120	6.26	0.07	0.009	0.021	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
2154	P-1032	J-555	J-723	0	300	120	3.02	0.04	0.002	0.012	PVC
2156	P-1033	J-723	J-724	0	300	120	3.02	0.04	0.002	0.011	PVC
2158	P-1034	J-724	J-725	0	300	120	3.02	0.04	0.003	0.011	PVC
2159	P-1035	J-725	J-192	0	300	120	3.02	0.04	0.004	0.011	PVC

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
185	J-160	TRUE	60	209.71	60	209.71	44.8	21.8	J-478
186	J-222	TRUE	230	350	230	350	45.7	40.3	J-317
187	J-162	TRUE	60	222.59	60	222.59	34.8	21.8	J-478
188	J-138	TRUE	60	96.73	60	96.73	21.8	42.8	J-700
189	J-192	TRUE	230	350	230	350	51.9	45.6	J-229
190	J-119	TRUE	60	144.15	60	144.15	28.8	21.8	J-111
191	J-134	TRUE	60	149.87	60.08	149.96	21.8	26.3	J-233
192	J-67	TRUE	230	350	230	350	54.5	47.3	J-697
193	J-38	TRUE	230	350	230.08	350.08	52.3	46.1	J-697
194	J-41	TRUE	230	350	230.08	350.08	54.9	46.3	J-697
195	J-144	TRUE	60	92.62	60	92.62	21.8	28.6	J-143
196	J-37	TRUE	230	350	230	350	52.7	46	J-697
197	J-472	TRUE	230	350	230	350	60	44.2	J-229
198	J-201	TRUE	230	350	230	350	65.7	44.5	J-317
199	J-91	TRUE	60	155.81	60	155.81	21.8	26.1	J-381
200	J-103	TRUE	60	127.75	60.08	127.84	21.8	33.2	J-102
201	J-53	TRUE	230	350	230.24	350.24	53.1	46.2	J-697
202	J-40	TRUE	230	350	230	350	57.6	46.4	J-697
203	J-107	TRUE	60	150.58	60	150.58	26.1	21.8	J-111
204	J-212	TRUE	230	302.39	230	302.39	21.8	25.9	J-211
205	J-197	TRUE	230	350	230	350	57.5	45.9	J-317
206	J-159	TRUE	60	202.05	60	202.05	42.9	21.8	J-478
207	J-163	TRUE	60	234.25	60	234.25	35.8	21.8	J-478
208	J-92	TRUE	60	133.53	60.06	133.59	21.8	46.3	J-86
209	J-90	TRUE	60	157.33	60.14	157.47	21.8	26	J-91
210	J-111	TRUE	60	111.45	60.14	111.59	21.8	21.8	J-721
211	J-177	TRUE	60	181.77	60	181.77	21.9	21.8	J-170
212	J-471	TRUE	230	350	230	350	58.3	43.8	J-229
213	J-233	TRUE	60	134.54	60.11	134.65	21.8	33.6	J-700
214	8 (Dun	TRUE	230	350	235.46	355.46	41.9	40.8	J-229
215	J-1	TRUE	230	350	231.44	351.44	73.3	48.6	J-697
216	J-174	TRUE	60	192.22	60.11	192.34	21.8	24.8	J-175
218	J-131	TRUE	60	173.78	60.11	173.89	25	21.8	J-700
219	J-100	TRUE	60	145.66	60.14	145.8	21.8	23.7	J-101
220	J-75	TRUE	60	347.99	60	347.99	21.8	22.7	J-507
221	J-60	TRUE	230	350	230	350	56.5	46.4	J-697
222	J-217	TRUE	230	350	230	350	59	48.4	J-697
223	J-146	TRUE	60	175.07	60	175.07	28.4	21.8	J-700
224	J-6	TRUE	230	350	230.08	350.08	24.4	44.6	J-7
225	J-169	TRUE	230	350	230	350	51.2	46.6	J-566
226	J-4	TRUE	230	350	230	350	59.2	48.1	J-697
227	J-27	TRUE	230	350	230.24	350.24	52.1	46.2	J-697
228	J-158	TRUE	60	185.63	60	185.63	33.4	21.8	J-478
229	J-14	TRUE	230	350	230	350	55.7	47.1	J-697
230	J-105	TRUE	60	146.04	60.14	146.18	21.8	37.1	J-700
231	J-261	TRUE	230	350	230	350	57.1	45.5	J-229
232	J-51	TRUE	230	350	230.48	350.48	56.9	45.9	J-697
233	J-183	TRUE	230	350	230	350	66.5	44.1	J-317
234	J-106	TRUE	60	151.33	60.08	151.41	27.9	21.8	J-111
235	J-244	TRUE	230	350	230	350	56.3	45.4	J-697
236	J-185	TRUE	230	350	230.96	350.96	62	44.3	J-317
237	J-205	TRUE	230	350	230	350	49.6	43.6	J-317
238	J-88	TRUE	60	155.82	60.14	155.96	24.9	21.8	J-483
239	J-87	TRUE	60	163.67	60	163.67	21.8	22.5	J-483
240	J-104	TRUE	60	191.47	60.14	191.61	21.8	25.4	J-473
241	J-246	TRUE	230	350	230	350	59.5	48.9	J-697
242	J-232	TRUE	60	164.95	60	164.95	25.3	21.8	J-436
243	J-30	TRUE	230	350	230.16	350.16	52.5	46.1	J-697

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
244	J-9	TRUE	230	350	230.08	350.08	54.1	45.3	J-697
245	J-182	TRUE	230	350	230.32	350.32	63.2	44.4	J-317
246	J-203	TRUE	230	350	230.56	350.56	55.3	43.9	J-317
247	J-65	TRUE	230	350	230	350	52.6	47.6	J-697
248	J-113	TRUE	60	170.31	60	170.31	24.6	21.8	J-111
249	J-126	TRUE	60	151.62	60.14	151.76	21.8	27.2	J-136
251	J-175	TRUE	60	181.42	60.06	181.48	21.8	23.5	J-170
252	J-108	TRUE	60	149.36	60.03	149.39	26	21.8	J-111
253	J-152	TRUE	60	162.88	60.11	162.99	26.9	21.8	J-478
254	J-200	TRUE	230	350	230	350	58.4	45.5	J-317
255	J-36	TRUE	230	350	230	350	54.9	45.9	J-697
256	J-143	TRUE	60	98.86	60	98.86	21.8	21.9	J-144
257	J-81	TRUE	60	258.2	60	258.2	41.6	21.8	J-372
258	J-12	TRUE	230	350	230	350	51.4	47.1	J-697
259	J-226	TRUE	230	350	230.16	350.16	39.1	39.3	J-317
260	J-45	TRUE	230	350	230.16	350.16	52.3	46.3	J-697
261	J-17	TRUE	230	350	230	350	54.5	46.6	J-697
262	J-206	TRUE	230	350	230	350	46.1	43	J-317
263	J-115	TRUE	60	156.97	60.06	157.03	26.6	21.8	J-111
264	J-150	TRUE	60	164.15	60	164.15	24.8	21.8	J-478
265	J-77	TRUE	60	350	60	350	28.2	24.6	J-372
266	J-18	TRUE	230	350	230	350	58.9	46.4	J-697
267	J-141	TRUE	60	105.65	60	105.65	22	21.8	J-143
268	J-8	TRUE	230	350	230.24	350.24	60	46.3	J-697
270	J-118	TRUE	60	137.37	60.14	137.51	21.8	27.3	J-413
271	J-34	TRUE	230	350	230	350	52.1	45.8	J-697
272	J-263	TRUE	230	350	230	350	55.9	45	J-229
273	J-135	TRUE	60	171.53	60.17	171.7	21.8	22	J-700
274	J-121	TRUE	60	183.71	60.03	183.73	21.8	28.3	J-122
275	J-181	TRUE	230	350	230.08	350.08	61.9	44.5	J-317
276	J-264	TRUE	230	350	234.89	354.89	52.4	45.5	J-229
277	J-220	TRUE	230	350	230.64	350.64	51.7	41.8	J-317
278	J-252	TRUE	60	305.8	60.03	305.83	21.8	23.6	J-253
279	J-142	TRUE	60	94.86	60	94.86	21.8	32.7	J-143
280	J-109	TRUE	60	146.95	60.08	147.03	29.2	21.8	J-111
281	J-129	TRUE	60	147.46	60.14	147.6	21.8	23.2	J-140
282	J-39	TRUE	230	350	230	350	52.7	46.2	J-697
283	J-164	TRUE	60	255.91	60	255.91	34.9	21.8	J-700
285	J-219	TRUE	230	350	230.24	350.24	56.5	42.6	J-317
286	J-469	TRUE	230	350	230	350	45.7	41.5	J-229
287	J-256	TRUE	60	100.72	60.08	100.8	21.8	21.8	J-499
288	J-120	TRUE	60	174.06	60	174.06	21.8	23.5	J-111
289	J-230	TRUE	230	350	230	350	34.5	32.5	J-229
290	J-130	TRUE	60	164.58	60.08	164.66	21.8	24.7	J-700
291	J-117	TRUE	60	138.4	60.08	138.48	21.8	24.4	J-118
292	J-223	TRUE	230	350	230	350	43.2	39.4	J-317
293	J-218	TRUE	230	350	230	350	59.2	48.7	J-697
294	J-46	TRUE	230	350	230	350	51.3	46.3	J-697
295	J-2	TRUE	230	350	230.88	350.88	64	48.4	J-697
296	J-26	TRUE	230	350	230.08	350.08	55.6	46.5	J-697
297	J-189	TRUE	60	350	60.11	350.11	42.4	33	J-372
298	J-211	TRUE	230	315.54	230	315.54	21.8	21.9	J-212
299	J-23	TRUE	230	350	230.08	350.08	52.3	46.3	J-697
301	J-59	TRUE	230	350	234.89	354.89	54.6	46.7	J-697
302	J-156	TRUE	60	163.79	60	163.79	25	21.8	J-478
303	J-199	TRUE	230	350	230.08	350.08	38.7	45.5	J-198
305	J-148	TRUE	60	168.26	60.03	168.29	26.1	21.8	J-478
306	J-132	TRUE	60	162.03	60.06	162.08	21.8	22.6	J-233

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307	J-19	TRUE	230	350	230	350	56.6	46.3	J-697
308	J-83	TRUE	60	224.19	60	224.19	21.8	23.4	J-662
309	J-139	TRUE	60	101.52	60.08	101.61	21.8	39.7	J-138
310	J-133	TRUE	60	151.56	60.06	151.61	24.2	21.8	J-233
311	J-96	TRUE	60	182.57	60.08	182.65	29.7	21.8	J-111
312	J-204	TRUE	230	350	230	350	54.4	43.8	J-317
313	J-52	TRUE	230	350	230	350	54.9	46	J-697
314	J-55	TRUE	230	350	230.24	350.24	54.1	46.8	J-697
315	J-74	TRUE	60	316.61	60	316.61	21.8	31.1	J-73
316	J-253	TRUE	60	275.13	60.03	275.16	21.8	26.4	J-682
317	J-225	TRUE	230	350	230	350	30.7	28	J-317
318	J-186	TRUE	230	350	230	350	66.3	44.4	J-317
319	J-66	TRUE	230	350	230	350	58.9	47.9	J-697
320	J-227	TRUE	230	350	230	350	35.1	35.6	J-228
321	J-54	TRUE	230	350	230	350	52.2	46.4	J-697
322	J-470	TRUE	230	350	230	350	51.9	42.8	J-229
323	J-165	TRUE	60	298.92	60	298.92	32.6	21.8	J-700
324	J-32	TRUE	230	350	230.24	350.24	54.9	45.9	J-697
325	J-42	TRUE	230	350	230.16	350.16	54.3	46.3	J-697
326	J-178	TRUE	230	350	230.48	350.48	54.9	45.6	J-317
327	J-93	TRUE	60	196.05	60.14	196.19	21.8	22.3	J-111
328	J-97	TRUE	60	171.81	60.08	171.9	35	21.8	J-111
329	J-122	TRUE	60	193.23	60.06	193.28	21.8	22.3	J-121
330	J-84	TRUE	60	205.7	60.03	205.73	21.8	23.8	J-85
331	J-62	TRUE	230	350	230	350	47.3	47.2	J-697
332	J-29	TRUE	230	350	230.08	350.08	51.3	46.1	J-697
333	J-94	TRUE	60	193.86	60	193.86	28.5	21.8	J-111
334	J-72	TRUE	60	141.38	60.08	141.47	21.8	32.5	J-693
335	J-188	TRUE	230	350	230	350	65.5	44.4	J-317
336	J-231	TRUE	60	264.54	60	264.54	21.8	34	J-209
337	J-229	TRUE	230	331.07	230.08	331.15	21.8	36.3	J-230
338	J-466	TRUE	230	350	230	350	41.2	39.6	J-229
339	J-10	TRUE	230	350	230.48	350.48	50	47.2	J-697
340	J-95	TRUE	60	188.22	60.03	188.25	28.6	21.8	J-111
341	5 (Dum	TRUE	230	350	235.46	355.46	51.2	46.4	J-697
342	J-78	TRUE	60	350	60	350	26.9	23.6	J-372
343	J-99	TRUE	60	153.47	60.2	153.67	30.3	21.8	J-111
345	J-7	TRUE	230	350	230	350	44.6	44.3	J-6
346	J-196	TRUE	230	350	230.4	350.4	58.4	46.1	J-317
347	J-208	TRUE	230	350	230.08	350.08	39.9	41.5	J-229
348	J-68	TRUE	60	228.63	60.11	228.75	21.8	39.4	J-69
349	J-73	TRUE	60	318.15	60.17	318.32	21.8	27.4	J-231
350	J-79	TRUE	60	340.32	60.35	340.67	23.7	21.8	J-372
351	J-464	TRUE	230	350	230	350	39.6	38.2	J-229
352	J-221	TRUE	230	350	230	350	47.4	41	J-317
353	J-63	TRUE	230	350	230.32	350.32	47.1	47.3	J-697
354	J-48	TRUE	230	350	230	350	51.3	46.2	J-697
355	J-173	TRUE	60	215.49	60.17	215.66	21.8	21.8	J-174
356	J-136	TRUE	60	157.23	60	157.23	21.8	25.7	J-126
357	J-255	TRUE	60	349.41	60.06	349.47	24	21.8	J-491
358	J-137	TRUE	60	187.99	60.11	188.1	21.8	27.9	J-456
359	J-44	TRUE	230	350	230	350	54.8	46.2	J-697
363	J-69	TRUE	60	237.66	60.11	237.77	21.8	32.7	J-68
364	J-461	TRUE	230	350	230.24	350.24	39.8	46.3	J-542
365	J-50	TRUE	230	350	230	350	50.5	46.1	J-697
366	J-58	TRUE	230	350	230.08	350.08	56.2	47	J-697
367	J-61	TRUE	230	350	230.08	350.08	48.9	47	J-697
368	6 (Dum	TRUE	230	350	235.46	355.46	52.6	46.8	J-697

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369	J-47	TRUE	230	350	230.08	350.08	52.6	46.4	J-697
370	J-176	TRUE	60	172.3	60.36	172.66	21.8	26.6	J-170
371	J-128	TRUE	60	125.4	60.11	125.51	22.9	21.8	J-138
372	J-151	TRUE	60	163.98	60.06	164.04	25.4	21.8	J-478
373	J-13	TRUE	230	350	230.08	350.08	56	47	J-697
374	J-33	TRUE	230	350	230	350	53.3	45.8	J-697
376	J-123	TRUE	60	193.47	60.01	193.48	21.8	25.2	J-122
378	J-21	TRUE	230	350	230.32	350.32	52.9	46.3	J-697
379	30 (Dum	TRUE	230	350	235.46	355.46	59.9	44.7	J-317
380	J-202	TRUE	230	350	230	350	64.5	44.4	J-317
381	J-168	TRUE	230	350	230	350	57.5	46.3	J-317
382	J-49	TRUE	230	350	230.32	350.32	49.5	46.1	J-697
383	J-110	TRUE	60	128.79	60.11	128.9	24.8	21.8	J-111
384	J-102	TRUE	60	138.88	60.08	138.96	23.4	21.8	J-103
385	J-31	TRUE	230	350	230	350	55.3	46	J-697
386	J-147	TRUE	60	175.48	60	175.48	30.3	21.8	J-478
387	J-28	TRUE	230	350	230	350	51.2	46.1	J-697
388	J-24	TRUE	230	350	230	350	50	46.3	J-697
389	J-465	TRUE	230	350	230	350	38	38.7	J-229
390	J-154	TRUE	60	154.96	60.08	155.05	24.1	21.8	J-478
391	J-89	TRUE	60	158.64	60.06	158.7	22.5	21.8	J-483
392	J-153	TRUE	60	158.16	60.08	158.24	26.6	21.8	J-478
394	J-98	TRUE	60	158.31	60.08	158.39	31.9	21.8	J-111
395	J-259	TRUE	230	350	230.96	350.96	51.4	47.5	J-697
396	J-3	TRUE	230	350	230.72	350.72	59.6	48.2	J-697
397	J-85	TRUE	60	194.98	60.76	195.74	21.8	25.7	J-86
398	J-71	TRUE	60	184.34	60.08	184.42	21.8	21.8	J-72
399	J-116	TRUE	60	138.3	60.08	138.38	21.8	24.4	J-103
400	J-167	TRUE	230	350	230	350	55.6	46.1	J-317
401	J-70	TRUE	60	265.02	60.08	265.11	21.8	21.8	J-72
402	J-43	TRUE	230	350	230	350	54.3	46.2	J-697
403	J-179	TRUE	230	350	230	350	56.9	45.3	J-317
406	J-224	TRUE	230	350	230.64	350.64	43.5	37.9	J-317
407	J-35	TRUE	230	350	230	350	57.2	45.6	J-697
408	J-145	TRUE	60	173.82	60	173.82	26.4	21.8	J-700
409	J-170	TRUE	60	162.06	60	162.06	21.8	30.3	J-177
410	J-228	TRUE	230	350	230.4	350.4	32.5	38.1	J-227
411	J-15	TRUE	230	350	230.48	350.48	54.2	46.8	J-697
412	eson Zo	TRUE	230	350	230.64	350.64	48.7	47.4	J-697
413	J-262	TRUE	230	350	230	350	57.9	44.3	J-229
414	J-76	TRUE	60	350	60	350	35.5	26.8	J-372
415	J-82	TRUE	60	276.84	60	276.84	21.8	23.1	J-552
416	J-187	TRUE	230	350	230.16	350.16	65.7	44.4	J-317
417	J-124	TRUE	60	196.17	60	196.17	21.8	25.1	J-123
418	J-86	TRUE	60	178.26	60.06	178.31	21.8	22.6	J-92
419	J-101	TRUE	60	140.95	60.11	141.06	21.8	24.2	J-103
420	J-140	TRUE	60	112.9	60.06	112.95	21.8	39.2	J-700
422	J-198	TRUE	230	350	231.77	351.77	45.5	45.5	J-199
423	J-248	TRUE	230	320.17	230	320.17	21.8	22.8	J-211
424	J-247	TRUE	230	344.64	230	344.64	22.1	21.8	J-248
426	J-5	TRUE	230	350	230	350	57.2	47.8	J-697
427	J-171	TRUE	60	220.04	60.08	220.13	21.8	24.2	J-172
428	J-22	TRUE	230	350	230.08	350.08	53.9	46.3	J-697
429	J-16	TRUE	230	350	230	350	54.1	46.7	J-697
430	J-184	TRUE	230	350	230.24	350.24	63.5	44.2	J-317
431	J-57	TRUE	230	350	230	350	52.9	46.9	J-697
432	J-11	TRUE	230	350	230.56	350.56	47.3	47.2	J-697
433	J-467	TRUE	230	350	230.96	350.96	42.8	40.3	J-229

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
434	J-127	TRUE	60	127.02	60.08	127.1	21.8	33	J-138
435	J-20	TRUE	230	350	230.08	350.08	52.5	46.3	J-697
436	J-172	TRUE	60	212.57	60.08	212.65	21.8	25.5	J-170
437	J-157	TRUE	60	183.27	60.03	183.3	31.9	21.8	J-478
438	J-161	TRUE	60	214.03	60	214.03	38.7	21.8	J-478
439	J-114	TRUE	60	169.53	60.01	169.53	24.4	21.8	J-111
440	J-149	TRUE	60	164.55	60.06	164.6	26.4	21.8	J-478
441	akesho	TRUE	60	170.93	60.14	171.07	27	21.8	J-111
442	J-257	TRUE	60	119.76	60.03	119.78	21.8	21.8	J-499
443	J-155	TRUE	60	150.68	60.06	150.74	21.9	21.8	J-478
444	0 (Dum	TRUE	60	305.78	61.91	307.68	41.4	21.8	J-372
445	J-125	TRUE	60	252.15	60.11	252.26	21.8	21.8	J-209
446	J-193	TRUE	60	350	60.08	350.08	33.2	27.3	J-194
447	J-194	TRUE	60	154.75	60.08	154.83	21.8	48.2	J-372
448	J-209	TRUE	60	159.48	60.08	159.57	21.8	47.8	J-372
449	J-214	TRUE	60	182.37	60	182.37	21.8	46.6	J-209
450	J-215	TRUE	60	350	60	350	23.9	27.1	J-491
451	J-216	TRUE	230	262.99	230	262.99	21.8	50.3	J-697
452	J-274	TRUE	60	350	60	350	33.9	26.4	J-194
453	J-275	TRUE	230	350	230.08	350.08	36	37	J-566
454	J-276	TRUE	230	350	230.08	350.08	66.8	44.5	J-317
455	J-277	TRUE	230	350	230.08	350.08	64.3	44.7	J-317
456	J-278	TRUE	230	350	230	350	62.4	50.9	J-317
457	9 (Dum	TRUE	230	350	235.46	355.46	61.8	50.9	J-317
458	J-280	TRUE	230	350	231.68	351.68	70.1	50.9	J-317
460	J-317	TRUE	230	306.22	230	306.22	21.8	35.6	J-225
461	reme S	TRUE	230	350	230	350	62	46.6	J-697
462	J-369	TRUE	230	350	230.16	350.16	48	45	J-697
463	J-413	TRUE	60	140.61	60	140.61	21.8	24.7	J-118
464	J-414	TRUE	230	350	230.08	350.08	54.4	44.5	J-229
465	J-415	TRUE	230	350	230	350	54	45.6	J-697
466	J-416	TRUE	230	350	230	350	56.6	44.5	J-229
467	J-417	TRUE	230	350	230	350	60.3	45.3	J-697
468	J-418	TRUE	230	350	230	350	60.2	45.3	J-697
469	J-426	TRUE	230	247.22	230	247.22	21.8	50.9	J-317
470	J-427	TRUE	230	268.89	230.8	269.69	21.8	50.5	J-697
472	J-433	TRUE	230	350	230.08	350.08	48.2	46.5	J-697
473	J-455	TRUE	60	147.04	60.03	147.07	27.4	21.8	J-436
474	J-456	TRUE	60	195	60	195	21.8	22.3	J-137
475	J-457	TRUE	60	195.32	60.06	195.37	23.3	21.8	J-459
476	J-458	TRUE	60	160.7	60.03	160.73	24.1	21.8	J-459
477	J-459	TRUE	60	142.49	60	142.49	21.8	35.5	J-458
478	J-460	TRUE	60	181.43	60.03	181.46	21.8	25	J-380
479	J-462	TRUE	60	191.28	60.03	191.31	21.8	27.2	J-459
480	J-473	TRUE	60	189.95	60	189.95	21.8	26.8	J-462
481	J-474	TRUE	230	350	230	350	42.6	43.2	J-683
482	J-475	TRUE	60	149.44	60	149.44	22.6	21.8	J-478
483	J-476	TRUE	60	147.64	60	147.64	23.3	21.8	J-478
484	J-477	TRUE	60	139.82	60.11	139.94	22.6	21.8	J-478
485	J-478	TRUE	60	133.29	60.03	133.32	21.8	24.4	J-482
486	J-479	TRUE	60	148.24	60	148.24	21.8	22.3	J-700
487	J-480	TRUE	60	148.14	60.06	148.2	21.8	25.3	J-479
488	ntry Sq	TRUE	60	116.55	60.01	116.55	22.6	21.8	J-482
489	J-482	TRUE	60	108.16	60	108.16	21.8	27.1	Country Squire
490	J-483	TRUE	60	138.56	60	138.56	21.8	36.1	J-88
491	J-484	TRUE	60	345.67	60.05	345.72	24.3	21.8	J-491
492	J-485	TRUE	60	343.3	60.03	343.33	25.1	21.8	J-491
493	reenbri	TRUE	60	341.12	60.11	341.23	26.1	21.8	J-491

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494	J-487	TRUE	60	337.46	60.03	337.49	24.5	21.8	J-491
495	J-488	TRUE	60	334.07	60	334.07	26	21.8	J-491
496	J-489	TRUE	60	326.97	60.03	327	28.8	21.8	J-491
497	J-490	TRUE	60	304.62	60.32	304.94	25.9	21.8	J-491
498	J-491	TRUE	60	285.58	60	285.58	21.8	26.5	J-353
499	J-492	TRUE	230	350	230.16	350.16	57.4	45.4	J-229
500	J-493	TRUE	230	350	230	350	56.7	46.8	J-229
501	J-494	TRUE	230	350	230	350	31.9	29.8	J-496
502	J-496	TRUE	230	320.56	230	320.56	21.8	23.6	J-701
503	J-497	TRUE	230	271.36	231.44	272.8	22.3	21.8	J-579
504	J-498	TRUE	230	243.92	230	243.92	21.8	23.7	J-579
505	J-499	TRUE	60	91.33	60.08	91.41	21.8	32	J-256
506	J-500	TRUE	60	275.81	60.08	275.9	21.8	40.6	J-209
507	Panattor	TRUE	230	350	231.12	351.12	41.2	41.7	J-569
508	J-502	TRUE	60	285.25	60.06	285.3	21.8	26.4	J-503
509	J-503	TRUE	60	252.72	60.08	252.8	21.8	29.8	J-504
510	J-504	TRUE	60	235.75	60.08	235.83	21.8	28.3	J-505
511	J-505	TRUE	60	226.37	60.11	226.48	21.8	34	J-504
512	J-506	TRUE	60	245.5	60.08	245.59	21.8	21.8	J-507
513	J-507	TRUE	60	171.12	60.08	171.21	21.8	46	J-372
514	J-508	TRUE	230	350	230	350	52.7	43.1	J-697
515	J-510	TRUE	60	119.29	60	119.29	34.8	21.8	J-372
516	J-511	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
518	J-338	TRUE	60	158.23	60.05	158.28	21.8	24.8	J-700
519	J-339	TRUE	60	171.31	60.11	171.43	23.1	21.8	J-700
520	J-340	TRUE	60	158.7	60.28	158.98	21.8	21.8	J-341
521	J-341	TRUE	60	135.36	60.06	135.42	21.8	31.7	J-340
522	J-342	TRUE	60	161.86	60	161.86	23.7	21.8	J-452
523	J-343	TRUE	60	146.7	60.17	146.87	23.7	21.8	J-452
524	J-344	TRUE	60	147.11	60	147.11	21.8	25	J-345
525	J-345	TRUE	60	149.37	60.14	149.51	21.8	23.7	J-346
526	J-346	TRUE	60	146.6	60	146.6	21.8	22.7	J-700
527	J-347	TRUE	60	331.54	60.44	331.98	24.3	21.8	J-348
528	J-348	TRUE	60	219.26	60.25	219.51	21.8	34.4	J-521
529	J-349	TRUE	60	235.53	60.08	235.62	21.8	22.7	J-524
530	J-350	TRUE	60	244.5	60	244.5	21.8	24.5	J-601
531	J-351	TRUE	60	239.12	60.79	239.91	21.8	24.2	J-525
532	J-352	TRUE	60	253.19	60	253.19	21.8	25.9	J-353
533	J-353	TRUE	60	254.39	60	254.39	21.8	28.6	J-352
534	J-354	TRUE	230	350	230	350	45.4	48.5	J-229
535	J-355	TRUE	60	350	60	350	45.9	48.9	J-229
536	J-356	TRUE	60	350	60	350	42.9	49	J-357
537	J-357	TRUE	60	350	60	350	32.9	45.5	J-358
538	J-358	TRUE	60	350	69.51	359.51	33.8	43.6	J-357
539	J-359	TRUE	60	350	68.9	358.9	38.3	41.9	J-361
540	J-360	TRUE	230	350	230	350	48.6	50.8	J-317
541	J-361	TRUE	230	288.86	233.57	292.43	21.8	35.3	J-441
542	J-362	TRUE	230	253.19	233.38	256.57	21.8	36.8	J-441
543	J-363	TRUE	230	290.75	238.92	299.67	23.7	21.8	J-362
544	J-364	TRUE	230	282.59	243.46	296.05	21.8	40	J-445
545	J-365	TRUE	230	334.08	238.92	343	33.5	21.8	J-441
546	J-367	TRUE	60	297.71	60.17	297.88	21.8	25.4	J-442
547	J-368	TRUE	60	291.16	62.14	293.3	21.8	32.6	J-367
548	J-370	TRUE	60	276.87	62.32	279.2	21.8	33.8	J-445
549	J-371	TRUE	60	234.13	60	234.13	21.8	24.7	J-601
550	J-372	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
551	J-373	TRUE	60	169.69	60	169.69	21.8	23.6	J-520
552	J-374	TRUE	60	177.05	60.16	177.21	21.8	26.2	J-373

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553	J-375	TRUE	60	198.81	60	198.81	21.8	25.1	J-374
554	J-376	TRUE	60	144.6	60.22	144.82	21.8	28.5	J-378
555	J-377	TRUE	60	109.08	60	109.08	27.9	21.8	J-378
556	J-378	TRUE	60	85.07	61.24	86.3	21.8	50.1	J-372
557	J-379	TRUE	60	195.04	61.2	196.24	21.8	25.7	J-378
558	J-380	TRUE	60	182.25	60	182.25	23.4	21.8	J-460
559	J-381	TRUE	60	156.91	60	156.91	21.8	23.4	J-91
560	J-382	TRUE	60	137.99	60	137.99	29.6	21.8	J-703
561	J-384	TRUE	230	350	232	352	46.9	46	J-620
562	J-385	TRUE	230	350	236.13	356.13	49.8	45.3	J-620
563	J-386	TRUE	230	350	238.29	358.29	35.9	34.9	J-711
564	J-387	TRUE	230	350	230	350	43.4	41.3	J-620
565	J-388	TRUE	230	350	230	350	47.5	46.1	J-566
566	J-389	TRUE	230	350	235.37	355.37	38	42.7	J-710
567	J-390	TRUE	230	350	230.72	350.72	52.7	45.1	J-697
568	)1 (Dum	TRUE	230	350	235.46	355.46	46.5	43.6	J-697
569	J-392	TRUE	230	350	230.08	350.08	40.1	37.6	J-697
570	J-393	TRUE	230	350	266.42	386.42	49	41.4	J-697
571	J-394	TRUE	230	350	232.67	352.67	23.4	38.5	J-679
572	J-395	TRUE	230	350	233.85	353.85	27.7	34.4	J-394
573	J-396	TRUE	230	350	237.4	357.4	26.3	30.8	J-397
574	J-397	TRUE	230	297.66	238.97	306.63	21.8	44.2	J-398
575	J-398	TRUE	230	348.62	236.85	355.48	21.8	29.5	J-397
576	J-399	TRUE	230	350	238.98	358.98	32	41.3	J-623
577	J-400	TRUE	230	350	235.06	355.06	51.5	46.7	J-697
578	J-401	TRUE	230	350	238.75	358.75	34	40.2	J-697
579	J-402	TRUE	230	350	230	350	31.1	40.4	J-635
580	J-403	TRUE	230	350	230	350	34.8	41.5	J-444
581	J-404	TRUE	230	350	238.6	358.6	29.5	35	J-622
582	J-406	TRUE	230	331.94	238.98	340.91	21.8	41.6	J-622
583	J-407	TRUE	230	350	239	359	28.2	38.5	J-406
584	J-408	TRUE	230	350	233.86	353.86	25.4	36	J-712
585	J-409	TRUE	230	350	234.3	354.3	22.1	34.6	J-410
586	J-410	TRUE	230	333.84	234.51	338.35	21.8	35.2	J-411
587	J-411	TRUE	230	347.19	232.57	349.76	21.8	34.3	J-590
588	J-412	TRUE	230	350	234.19	354.19	42.3	42	J-590
589	J-420	TRUE	230	350	238.84	358.84	28.4	40.6	J-620
590	J-421	TRUE	230	350	230	350	28.6	41.5	J-411
591	J-422	TRUE	230	350	230	350	43.9	36.9	J-590
592	J-423	TRUE	230	350	238.96	358.96	26.4	40.4	J-410
593	J-424	TRUE	230	350	230.24	350.24	53.7	44.3	J-697
594	J-425	TRUE	230	350	230	350	46.3	42.8	J-697
596	J-429	TRUE	60	208.03	60.35	208.38	21.8	25	J-478
597	J-430	TRUE	60	144.59	60.45	145.04	21.8	26.3	J-480
598	J-431	TRUE	60	158.79	60.03	158.82	21.8	27.8	J-170
600	J-435	TRUE	60	131.09	60.52	131.61	21.8	28.3	J-553
601	J-436	TRUE	60	128.01	60	128.01	21.8	32.4	J-435
602	J-437	TRUE	60	171.85	60	171.85	26.8	21.8	J-700
603	J-438	TRUE	60	174.44	60.05	174.49	25.4	21.8	J-700
604	J-439	TRUE	230	350	233.42	353.42	32.4	41.6	J-624
605	J-440	TRUE	230	325.73	230	325.73	26	21.8	J-441
606	J-441	TRUE	230	304.41	235.28	309.69	21.8	27.9	J-362
607	J-442	TRUE	60	238.28	61.57	239.86	21.8	40.4	J-367
609	J-444	TRUE	230	350	236.49	356.49	34.7	42.7	J-635
610	J-445	TRUE	230	275.08	238.91	283.99	21.8	33.9	J-370
614	J-449	TRUE	230	350	231.68	351.68	39.4	42	J-208
615	J-450	TRUE	230	350	230	350	63	47.2	J-697
616	J-451	TRUE	230	350	230.64	350.64	55.4	45.3	J-317

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617	J-452	TRUE	60	127.52	60.2	127.72	21.8	31.8	J-343
618	J-453	TRUE	60	173.65	60.17	173.82	31.2	21.8	J-700
619	J-454	TRUE	230	350	230.72	350.72	91.7	50.9	J-317
620	J-463	TRUE	230	350	233.71	353.71	42.5	44.7	J-697
621	J-481	TRUE	230	350	230.96	350.96	58.8	44.7	J-697
623	J-495	TRUE	230	350	230	350	60	45.2	J-697
624	J-514	TRUE	230	350	230.32	350.32	46.3	45.2	J-697
625	J-509	TRUE	230	350	234.94	354.94	44.5	42.2	J-444
1202	J-515	TRUE	230	291.7	230.4	292.1	21.8	33.5	J-695
1205	J-516	TRUE	230	350	230	350	48	41.7	J-697
1210	J-518	TRUE	230	350	230	350	33.3	44.3	J-697
1212	J-519	TRUE	230	350	230	350	47	45.1	J-697
1215	J-520	TRUE	60	139.84	60	139.84	21.8	32.3	J-373
1217	J-521	TRUE	60	208.63	60	208.63	21.8	23.4	J-523
1221	J-523	TRUE	60	136.79	60	136.79	21.8	48.9	J-372
1223	J-524	TRUE	60	213.42	60	213.42	21.8	30.7	J-349
1225	J-525	TRUE	60	153.65	60	153.65	21.8	48.3	J-351
1247	J-529	TRUE	230	350	230	350	57.2	45.2	J-697
1250	J-530	TRUE	230	350	230	350	52.6	45.2	J-697
1252	J-531	TRUE	230	350	230	350	52.5	45.1	J-697
1254	J-532	TRUE	230	350	230	350	52.6	45.1	J-697
1261	J-535	TRUE	230	350	230	350	48.8	47.3	J-578
1266	J-536	TRUE	230	350	234.96	354.96	35.1	35	J-541
1268	J-537	TRUE	230	350	230.16	350.16	34.2	41.3	J-539
1272	J-539	TRUE	230	303.9	233.29	307.2	21.8	41.9	J-537
1274	J-540	TRUE	230	350	230	350	29.8	35	J-541
1276	J-541	TRUE	230	350	230	350	28.1	37.1	J-536
1279	J-542	TRUE	230	350	230	350	41	42.4	J-461
1289	J-546	TRUE	230	350	231.68	351.68	36.5	42.6	J-537
1293	J-547	TRUE	230	350	230	350	37.8	38	J-541
1303	J-550	TRUE	230	350	230	350	76	50.9	J-317
1308	J-552	TRUE	60	210.3	60.03	210.33	21.8	38	J-372
1310	J-553	TRUE	60	138.32	60	138.32	21.8	26.2	J-435
1313	J-554	TRUE	230	350	230	350	57	45.7	J-317
1317	J-555	TRUE	230	350	230	350	55.7	45.6	J-229
1320	J-556	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1322	J-557	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1323	J-558	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
1330	J-560	TRUE	230	350	230.96	350.96	45.5	46.5	J-620
1333	J-561	TRUE	230	350	230	350	63	50.3	J-697
1336	J-562	TRUE	230	350	230.08	350.08	61.2	45.2	J-317
1339	J-563	TRUE	230	350	232.17	352.17	50	45.5	J-317
1342	J-564	TRUE	230	350	230	350	50.6	45.8	J-317
1345	J-565	TRUE	230	350	230	350	45.8	39	J-566
1348	J-566	TRUE	230	350	230.08	350.08	31.3	38.3	J-275
1351	J-567	TRUE	230	300	230.08	300.08	26.7	26.7	J-567
1353	J-568	TRUE	230	350	230	350	45.1	43	J-229
1356	J-569	TRUE	230	350	230	350	38.5	39.6	J-578
1359	J-570	TRUE	230	350	230	350	35	36	J-571
1362	J-571	TRUE	230	350	230	350	33.1	34.4	J-578
1366	J-573	TRUE	230	350	230.4	350.4	60.4	46.3	J-697
1369	J-574	TRUE	230	350	230	350	58.7	45.6	J-697
1372	J-575	TRUE	230	350	230	350	45.3	44.7	J-697
1375	J-576	TRUE	230	350	233.61	353.61	49.2	44.1	J-697
1385	J-577	TRUE	230	350	230	350	80.4	50.9	J-317
1387	J-578	TRUE	230	350	230	350	32.4	35.1	J-571
1390	J-579	TRUE	230	247.8	230	247.8	21.8	22.4	J-498
1395	J-582	TRUE	230	231.21	232.23	233.44	21.8	29.8	J-579

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
1399	J-584	TRUE	230	350	230	350	37.1	32.5	J-620
1401	J-585	TRUE	230	350	230	350	49.1	37.9	J-620
1405	J-586	TRUE	230	350	230.24	350.24	47.4	43.9	J-697
1410	J-588	TRUE	230	350	230.8	350.8	59.8	50.9	J-317
1422	J-590	TRUE	230	350	237.88	357.88	31.1	32.6	J-411
1425	J-591	TRUE	230	350	236.91	356.91	41.1	42	J-620
1428	J-592	TRUE	230	350	231.14	351.14	65.9	50.9	J-317
1435	J-595	TRUE	230	350	236.12	356.12	29.7	30.1	J-596
1437	J-596	TRUE	230	321.37	238.32	329.69	21.8	39	J-598
1442	J-598	TRUE	230	342.04	238.64	350.68	21.8	33.6	J-596
1445	J-599	TRUE	230	350	230	350	46.1	50.9	J-317
1449	J-601	TRUE	60	236.11	61.46	237.58	21.8	24.5	J-371
1452	J-602	TRUE	60	316.08	60	316.08	21.8	24.1	J-252
1459	J-604	TRUE	60	346.62	61.47	348.1	22.8	21.8	J-491
1462	J-605	TRUE	60	338.13	60.84	338.97	24.4	21.8	J-372
1466	J-606	TRUE	230	350	234.97	354.97	54.7	50.9	J-317
1473	J-607	TRUE	230	350	230	350	40.2	44.7	J-697
1475	J-608	TRUE	230	350	230	350	53.4	44.2	J-697
1478	J-609	TRUE	230	350	230	350	42.6	44.2	J-697
1480	J-610	TRUE	230	350	231.52	351.52	46.7	43.5	J-697
1483	J-611	TRUE	230	350	230	350	53.8	45.3	J-697
1499	J-613	TRUE	230	350	235.74	355.74	47.7	46.2	J-620
1504	J-614	TRUE	230	350	230	350	43.7	37.7	J-566
1521	J-617	FALSE	230	226.04	231.66	227.7	21.8	50.9	J-317
1526	J-619	TRUE	230	350	234.14	354.14	33.3	39.9	J-620
1529	J-620	TRUE	230	350	230	350	24.7	40	J-584
1538	J-621	TRUE	230	350	230	350	46.2	43.9	J-361
1542	J-622	TRUE	230	350	230	350	31.1	37.9	J-620
1545	J-623	TRUE	230	350	230	350	32.5	38.7	J-398
1548	J-624	TRUE	230	350	235.03	355.03	32.3	41.6	J-439
1552	J-626	TRUE	230	350	230	350	48	40.2	J-590
1556	J-628	TRUE	230	350	230	350	45.5	39.3	J-697
1559	J-629	TRUE	230	350	230	350	63.8	41	J-697
1563	J-631	TRUE	230	350	230.74	350.74	38.6	37.5	J-394
1604	J-632	TRUE	230	350	230	350	53.4	47.1	J-229
1619	J-634	TRUE	230	350	230	350	43.9	38.4	J-697
1623	J-635	TRUE	250	350	258.1	358.1	37.4	42	J-444
1634	J-637	TRUE	230	350	230	350	37.3	44.3	J-359
1681	J-642	TRUE	230	350	230	350	48.5	41.5	J-697
1711	J-644	TRUE	60	116.93	61.55	118.47	21.8	35.7	J-703
1741	J-647	TRUE	230	350	230	350	40.9	39.7	J-697
1744	8 (Dum	TRUE	230	350	235.46	355.46	32.1	37.7	J-649
1746	J-649	TRUE	230	350	230	350	35.1	37.1	J-677
1748	J-650	TRUE	230	350	230	350	39	39.1	J-697
1857	J-662	TRUE	60	161.65	60.08	161.73	21.8	43.5	J-372
1859	J-663	TRUE	60	147.9	60.1	148	21.8	45.2	J-372
1930	J-668	TRUE	230	350	230.5	350.5	81.2	50.9	J-317
1933	J-669	TRUE	230	350	233.6	353.6	48.9	45.6	J-620
1936	J-670	TRUE	230	334.83	231.87	336.7	21.8	46.8	J-620
1938	J-671	TRUE	230	350	233.97	353.97	38.8	37.9	J-620
1941	J-672	TRUE	230	350	234.06	354.06	42.5	39.1	J-619
1944	J-673	TRUE	230	350	230.67	350.67	50.4	39.1	J-697
1947	J-674	TRUE	230	350	237.73	357.73	42.7	41.8	J-620
1949	J-675	TRUE	230	350	231	351	58.5	45.2	J-697
1952	J-676	TRUE	230	350	230.31	350.31	56.2	44.4	J-697
1955	J-677	TRUE	230	350	232.81	352.81	29.4	38	J-649
1956	J-678	TRUE	230	350	230	350	37.7	36	J-677
1957	J-679	TRUE	230	350	230	350	36.6	33.8	J-394

ID	Label	Satisfies Fire Flow Constraints?	Fire Flow (Needed) (L/s)	Fire Flow (Available) (L/s)	Flow (Total Needed) (L/s)	Flow (Total Available) (L/s)	Pressure (Calculated Residual) (kPa)	Pressure (Calculated Zone Lower Limit) (kPa)	Junction w/ Minimum Pressure (Zone)
1959	J-681	TRUE	230	350	230	350	49	37.8	J-394
1965	J-682	TRUE	60	234.89	60.38	235.27	21.8	31.2	J-371
1969	J-683	TRUE	230	350	231.93	351.93	31.1	42.6	J-474
1970	J-684	TRUE	230	338.88	230.85	339.74	21.8	23.4	J-707
1974	J-685	TRUE	230	350	232.25	352.25	56.2	46.1	J-229
1977	J-686	TRUE	230	350	231.12	351.12	40.1	46.8	J-229
1980	J-687	TRUE	230	350	230.22	350.22	45.4	44.2	J-697
1983	J-688	TRUE	230	350	230.3	350.3	46.8	45.2	J-697
1986	J-689	TRUE	230	350	230.8	350.8	47	43.8	J-697
1989	J-690	TRUE	60	159.53	60.74	160.27	41.6	21.8	J-372
1995	J-692	TRUE	60	107.89	60.38	108.27	21.8	21.8	J-499
1998	J-693	TRUE	60	156.61	60.06	156.66	21.8	21.8	J-72
2001	J-694	TRUE	230	253.42	230.83	254.25	21.8	38.6	J-695
2004	J-695	TRUE	230	249.37	231	250.36	21.8	38.6	J-694
2007	J-696	FALSE	230	178.96	230	178.96	21.8	50.9	J-317
2009	J-697	TRUE	230	350	231.23	351.23	36.4	41.3	J-650
2012	J-698	TRUE	230	350	230.22	350.22	59.9	46.1	J-697
2015	J-699	TRUE	230	350	230.12	350.12	51.8	44.7	J-697
2020	J-700	TRUE	60	146.66	60.17	146.82	21.8	23	J-346
2024	J-701	TRUE	230	293.98	231.8	295.77	21.8	22.9	J-579
2027	J-702	TRUE	230	350	233.93	353.93	58.3	50.9	J-317
2030	J-703	TRUE	60	109.36	61.23	110.59	21.8	48	J-382
2033	J-704	TRUE	60	350	60	350	21.6	13.8	J-372
2038	J-705	TRUE	230	289.44	230	289.44	21.8	45.2	J-697
2039	J-706	TRUE	230	350	230	350	28	34.6	J-712
2040	J-707	TRUE	230	328.2	230	328.2	21.8	26.1	J-684
2045	J-708	TRUE	230	350	230	350	26.4	37.6	J-410
2048	J-709	TRUE	230	350	230	350	48	46.3	J-620
2051	J-710	TRUE	230	350	230	350	39.2	41.6	J-389
2054	J-711	TRUE	230	350	230	350	31.2	38.4	J-619
2062	J-712	TRUE	230	300	230	300	25.6	42.3	J-410
2064	J-713	TRUE	230	300	230	300	44.3	61.2	J-719
2071	J-715	TRUE	230	300	230	300	33.9	38.6	J-696
2087	J-716	TRUE	230	300	230	300	46.9	45.5	J-420
2090	J-717	TRUE	230	300	230	300	41.3	39.5	J-410
2093	J-718	TRUE	230	350	230	350	41.6	42.4	J-620
2142	J-719	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2145	J-720	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2148	J-721	(N/A)	60	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2153	J-723	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2155	J-724	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)
2157	J-725	(N/A)	230	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)	(N/A)

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
185	J-160	584,027.01	5,934,838.88	678.02	0	77.70	732.74
186	J-222	582,145.56	5,932,813.74	700.26	0	62.90	744.54
187	J-162	583,810.38	5,934,670.57	685.00	0	67.80	732.75
188	J-138	584,613.67	5,935,181.42	678.38	0	77.10	732.69
189	J-192	581,191.96	5,933,912.97	677.56	0	94.60	744.24
190	J-119	584,936.53	5,935,869.14	667.10	0	73.70	719.00
191	J-134	584,764.89	5,935,072.26	680.51	0.13	74.10	732.70
192	J-67	581,650.04	5,931,561.40	710.00	0	72.30	760.93
193	J-38	581,243.76	5,931,279.09	710.00	0.12	71.40	760.31
194	J-41	581,141.03	5,931,480.63	710.00	0.12	71.50	760.35
195	J-144	584,396.66	5,935,219.39	675.00	0	81.90	732.69
196	J-37	581,243.76	5,931,168.95	710.00	0	71.40	760.27
197	J-472	580,740.47	5,933,183.14	689.91	0	77.30	744.40
198	J-201	581,815.00	5,933,229.15	690.13	0	77.20	744.49
199	J-91	582,694.12	5,935,128.13	660.00	0	79.50	715.98
200	J-103	585,091.20	5,936,277.99	665.00	0.13	76.60	719.00
201	J-53	581,438.28	5,930,980.15	710.00	0.36	71.50	760.36
202	J-40	581,233.98	5,931,482.32	710.00	0	71.50	760.38
203	J-107	584,778.23	5,935,996.97	664.16	0	77.80	719.00
204	J-212	581,825.45	5,932,053.99	710.00	0	72.70	761.25
205	J-197	581,603.91	5,933,472.82	685.44	0	83.60	744.37
206	J-159	584,150.38	5,934,848.85	679.15	0	76.10	732.73
207	J-163	583,696.80	5,934,580.94	685.00	0	67.80	732.76
208	J-92	582,355.13	5,935,027.71	660.00	0.08	79.40	715.92
209	J-90	582,616.55	5,935,084.61	660.00	0.21	79.40	715.97
210	J-111	585,098.38	5,935,794.30	672.05	0.21	66.60	719.00
211	J-177	583,865.02	5,934,178.46	693.29	0	56.00	732.74
212	J-471	580,745.35	5,933,130.74	690.00	0	77.20	744.40
213	J-233	584,681.75	5,934,979.21	681.75	0.17	72.30	732.70
214	68 (Dum	580,952.95	5,932,747.92	698.59	8.18	65.10	744.44
215	J-1	579,511.27	5,931,168.86	705.00	2.17	82.70	763.26
216	J-174	583,865.88	5,934,330.48	690.60	0.17	59.80	732.74
218	J-131	584,433.28	5,934,995.60	679.54	0.17	75.50	732.70
219	J-100	584,835.40	5,936,162.83	665.00	0.21	76.60	719.00
220	J-75	581,067.83	5,934,963.64	655.66	0	85.40	715.85
221	J-60	581,268.02	5,931,483.28	710.00	0	71.50	760.40
222	J-217	581,836.74	5,931,627.98	710.00	0	73.20	761.56
223	J-146	584,443.42	5,934,865.47	686.39	0	65.70	732.71
224	J-6	579,945.01	5,931,013.88	708.42	0.12	74.10	760.61
225	J-169	583,532.49	5,933,358.14	700.00	0	63.30	744.58
226	J-4	579,847.42	5,931,278.15	705.69	0	79.90	762.01
227	J-27	580,669.54	5,930,951.45	710.00	0.36	71.40	760.27
228	J-158	584,415.79	5,934,856.33	685.70	0	66.70	732.72
229	J-14	580,335.90	5,931,383.96	710.00	0	71.40	760.27
230	J-105	584,480.67	5,935,747.97	663.83	0.21	78.30	719.00
231	J-261	581,205.35	5,933,531.77	685.10	0	84.00	744.31
232	J-51	581,311.65	5,930,974.43	710.00	0.72	71.30	760.25

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
233	J-183	582,114.01	5,933,238.15	690.57	0	76.60	744.50
234	J-106	584,742.82	5,936,007.34	663.04	0.13	79.40	719.00
235	J-244	581,247.28	5,930,944.87	712.82	0	67.20	760.17
236	J-185	582,109.89	5,933,372.58	689.49	1.44	78.10	744.50
237	J-205	581,855.89	5,932,883.46	697.62	0	66.60	744.55
238	J-88	582,477.45	5,934,962.82	661.52	0.21	77.30	715.95
239	J-87	582,416.94	5,934,900.96	661.92	0	76.70	715.94
240	J-104	584,294.78	5,935,708.60	663.84	0.21	78.30	719.01
241	J-246	581,897.49	5,931,628.85	710.00	0	73.70	761.90
242	J-232	584,892.94	5,934,920.80	684.28	0	68.70	732.70
243	J-30	580,902.68	5,930,954.31	710.00	0.24	71.30	760.26
244	J-9	580,323.88	5,930,706.90	710.00	0.12	71.20	760.15
245	J-182	582,375.00	5,933,263.31	692.23	0.48	74.20	744.50
246	J-203	581,820.84	5,933,082.06	694.39	0.84	71.20	744.52
247	J-65	581,778.70	5,931,509.37	710.00	0	72.50	761.10
248	J-113	584,707.09	5,935,813.70	666.13	0	75.10	719.00
249	J-126	584,863.23	5,935,234.31	677.59	0.21	78.20	732.69
251	J-175	583,860.04	5,934,212.11	692.89	0.08	56.60	732.74
252	J-108	584,859.07	5,935,946.29	665.31	0.04	76.20	719.00
253	J-152	584,376.31	5,934,716.20	687.39	0.17	64.30	732.71
254	J-200	581,603.76	5,933,231.65	690.97	0	75.90	744.43
255	J-36	581,245.19	5,931,074.55	710.09	0	71.20	760.24
256	J-143	584,418.36	5,935,234.31	675.12	0	81.70	732.69
257	J-81	581,858.80	5,934,643.74	665.00	0	72.30	715.90
258	J-12	580,220.70	5,931,351.93	710.00	0	71.50	760.40
259	J-226	582,264.78	5,932,630.99	705.95	0.24	54.80	744.57
260	J-45	580,893.42	5,931,477.97	710.00	0.24	71.40	760.30
261	J-17	580,311.95	5,931,197.47	710.00	0	71.40	760.31
262	J-206	581,857.12	5,932,625.05	705.00	0	56.20	744.59
263	J-115	584,825.79	5,935,796.19	666.72	0.08	74.20	719.00
264	J-150	584,403.44	5,934,788.09	687.49	0	64.20	732.71
265	J-77	581,167.95	5,934,784.85	659.73	0	79.70	715.87
266	J-18	580,314.80	5,931,075.86	708.85	0	73.00	760.31
267	J-141	584,418.36	5,935,257.37	675.00	0	81.90	732.69
268	J-8	580,315.10	5,931,044.42	708.00	0.36	74.30	760.31
270	J-118	585,014.92	5,935,991.35	667.08	0.21	73.70	719.00
271	J-34	581,184.46	5,930,958.60	713.60	0	66.20	760.21
272	J-263	580,990.65	5,933,540.47	686.38	0	82.30	744.33
273	J-135	584,890.35	5,935,064.77	680.00	0.25	74.80	732.70
274	J-121	584,820.49	5,935,506.24	675.00	0.04	62.50	719.01
275	J-181	582,540.59	5,933,275.94	693.31	0.12	72.70	744.50
276	J-264	581,189.28	5,933,693.30	681.63	7.34	88.90	744.26
277	J-220	582,117.40	5,932,983.49	695.93	0.96	69.00	744.52
278	J-252	578,937.82	5,934,828.30	660.00	0.04	79.00	715.64
279	J-142	584,423.78	5,935,296.70	675.00	0	81.90	732.69
280	J-109	584,921.74	5,935,884.21	666.76	0.13	74.20	719.00
281	J-129	584,501.09	5,935,261.44	676.15	0.21	80.20	732.69

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
282	J-39	581,239.51	5,931,322.53	710.00	0	71.40	760.32
283	J-164	583,606.03	5,934,540.88	685.74	0	66.80	732.77
285	J-219	582,113.42	5,933,083.07	693.64	0.36	72.20	744.51
286	J-469	580,912.58	5,932,829.94	695.69	0	69.20	744.43
287	J-256	580,441.19	5,935,464.19	655.00	0.13	86.20	715.69
288	J-120	584,734.38	5,935,692.75	670.15	0	69.30	719.00
289	J-230	581,106.83	5,932,460.94	706.93	0	53.40	744.54
290	J-130	584,431.22	5,935,093.29	677.58	0.13	78.20	732.69
291	J-117	585,014.92	5,936,121.64	665.00	0.13	76.60	719.00
292	J-223	582,152.61	5,932,731.90	702.98	0	59.00	744.55
293	J-218	581,867.74	5,931,628.35	710.00	0	73.40	761.73
294	J-46	580,798.60	5,931,476.05	710.00	0	71.40	760.29
295	J-2	579,680.28	5,931,170.16	705.50	1.32	81.20	762.68
296	J-26	580,564.63	5,931,456.51	710.00	0.12	71.40	760.27
297	J-189	581,084.12	5,934,453.39	665.00	0.17	72.20	715.87
298	J-211	581,876.01	5,932,068.33	710.09	0	72.60	761.25
299	J-23	580,668.11	5,931,070.17	710.00	0.12	71.40	760.27
301	J-59	581,386.82	5,931,485.18	710.00	7.34	71.70	760.49
302	J-156	584,404.53	5,934,722.07	688.13	0	63.30	732.71
303	J-199	581,769.17	5,933,510.82	685.00	0.12	84.30	744.37
305	J-148	584,454.98	5,934,760.96	689.42	0.04	61.40	732.71
306	J-132	584,558.06	5,935,001.03	680.87	0.08	73.60	732.70
307	J-19	580,403.49	5,931,080.18	707.98	0	74.30	760.30
308	J-83	581,967.59	5,934,879.14	661.00	0	77.90	715.90
309	J-139	584,644.86	5,935,312.98	676.87	0.13	79.20	732.69
310	J-133	584,653.03	5,935,049.18	680.00	0.08	74.80	732.70
311	J-96	584,368.02	5,935,856.50	660.02	0.13	83.70	719.00
312	J-204	581,850.05	5,933,080.11	694.67	0	70.80	744.52
313	J-52	581,362.87	5,930,976.72	710.00	0	71.40	760.30
314	J-55	581,524.10	5,931,157.51	710.00	0.36	71.80	760.59
315	J-74	580,931.94	5,934,929.32	656.10	0	84.80	715.82
316	J-253	578,957.63	5,934,474.88	660.00	0.04	79.00	715.64
317	J-225	582,168.53	5,932,538.56	707.11	0	53.20	744.57
318	J-186	582,113.31	5,933,524.29	685.00	0	84.50	744.50
319	J-66	581,776.04	5,931,621.09	710.00	0	72.70	761.20
320	J-227	582,440.48	5,932,638.63	706.71	0	53.70	744.57
321	J-54	581,528.40	5,930,990.16	710.00	0	71.60	760.44
322	J-470	580,815.61	5,933,005.16	692.36	0	73.90	744.42
323	J-165	583,521.11	5,934,524.87	687.40	0	64.40	732.78
324	J-32	581,064.31	5,930,954.31	710.00	0.36	71.30	760.24
325	J-42	581,092.22	5,931,480.07	710.00	0.24	71.40	760.34
326	J-178	583,196.31	5,933,356.52	696.11	0.72	68.70	744.51
327	J-93	584,191.17	5,935,768.07	660.00	0.21	83.80	719.01
328	J-97	584,487.83	5,935,930.76	660.00	0.13	83.70	719.00
329	J-122	584,821.83	5,935,460.16	675.00	0.08	62.50	719.01
330	J-84	582,052.57	5,934,877.70	660.32	0.04	78.90	715.90
331	J-62	581,787.29	5,931,163.23	710.00	0	72.10	760.81

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
332	J-29	580,819.72	5,930,954.31	710.00	0.12	71.30	760.26
333	J-94	584,255.00	5,935,803.19	660.00	0	83.80	719.00
334	J-72	580,939.25	5,935,281.52	655.00	0.13	86.30	715.79
335	J-188	582,266.79	5,933,527.86	686.55	0	82.30	744.50
336	J-231	580,791.64	5,934,829.71	658.98	0	80.70	715.81
337	J-229	581,106.36	5,932,407.45	708.32	0.12	51.40	744.54
338	J-466	580,911.13	5,932,595.87	700.92	0	61.80	744.49
339	J-10	579,940.63	5,931,347.65	705.00	0.72	79.00	760.66
340	J-95	584,308.01	5,935,828.08	660.00	0.04	83.80	719.00
341	5 (Dumr	580,618.70	5,931,343.45	710.00	8.18	71.40	760.27
342	J-78	581,169.38	5,934,827.76	658.78	0	81.00	715.87
343	J-99	584,705.73	5,936,073.73	662.40	0.29	80.30	719.00
345	J-7	579,949.27	5,931,039.18	708.18	0	74.40	760.61
346	J-196	581,597.38	5,933,587.35	683.44	0.6	86.50	744.35
347	J-208	581,439.10	5,932,459.61	706.90	0.12	53.40	744.54
348	J-68	580,592.95	5,934,845.60	659.96	0.17	79.20	715.74
349	J-73	580,877.59	5,934,935.04	656.37	0.25	84.40	715.81
350	J-79	581,379.39	5,934,807.01	659.35	0.52	80.20	715.88
351	J-464	580,909.59	5,932,458.81	705.00	0	56.10	744.54
352	J-221	582,125.37	5,932,889.89	698.69	0	65.10	744.54
353	J-63	581,781.57	5,931,261.93	710.00	0.48	72.20	760.89
354	J-48	580,984.87	5,931,374.92	710.00	0	71.40	760.29
355	J-173	583,884.96	5,934,430.17	688.11	0.25	63.40	732.75
356	J-136	584,891.71	5,935,152.93	679.69	0	75.20	732.69
357	J-255	580,263.72	5,934,844.03	655.00	0.08	86.20	715.70
358	J-137	584,631.30	5,935,458.11	675.00	0.17	62.50	719.01
359	J-44	580,980.30	5,931,477.21	710.00	0	71.40	760.30
363	J-69	580,683.06	5,934,980.81	657.45	0.17	82.80	715.77
364	J-461	580,324.91	5,931,786.10	709.66	0.36	71.30	759.91
365	J-50	580,982.78	5,931,104.50	710.00	0	71.40	760.27
366	J-58	581,515.23	5,931,487.78	710.00	0.12	71.90	760.63
367	J-61	581,675.72	5,931,158.94	710.00	0.12	72.00	760.72
368	6 (Dumr	581,521.24	5,931,231.89	710.00	8.18	71.80	760.60
369	J-47	580,657.25	5,931,474.23	710.00	0.12	71.40	760.28
370	J-176	583,816.43	5,934,177.51	694.01	0.55	55.00	732.74
371	J-128	584,625.87	5,935,253.30	677.60	0.17	78.20	732.69
372	J-151	584,368.17	5,934,786.73	686.46	0.08	65.60	732.71
373	J-13	580,314.34	5,931,355.17	710.00	0.12	71.40	760.31
374	J-33	581,129.33	5,930,960.12	711.70	0	68.90	760.22
376	J-123	584,823.26	5,935,405.93	675.00	0.01	62.50	719.01
378	J-21	580,469.94	5,931,023.06	709.21	0.48	72.50	760.29
379	30 (Dum	582,732.45	5,933,277.32	694.69	8.18	70.70	744.51
380	J-202	581,938.04	5,933,230.80	691.08	0	75.80	744.50
381	J-168	583,530.88	5,933,486.18	696.64	0	68.00	744.51
382	J-49	580,979.92	5,931,250.39	710.00	0.48	71.40	760.28
383	J-110	584,991.94	5,935,799.82	669.94	0.17	69.60	719.00
384	J-102	585,009.28	5,936,277.18	663.86	0.13	78.30	719.00

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
385	J-31	580,988.50	5,930,955.74	710.00	0	71.30	760.25
386	J-147	584,453.45	5,934,840.49	687.96	0	63.50	732.71
387	J-28	580,746.77	5,930,951.45	710.00	0	71.30	760.26
388	J-24	580,662.38	5,931,227.51	710.00	0	71.40	760.27
389	J-465	580,908.44	5,932,502.26	705.00	0	56.10	744.52
390	J-154	584,411.58	5,934,645.67	688.86	0.13	62.20	732.71
391	J-89	582,495.94	5,935,018.15	660.81	0.08	78.30	715.95
392	J-153	584,372.24	5,934,648.39	687.96	0.13	63.50	732.71
394	J-98	584,633.48	5,936,025.02	660.29	0.13	83.30	719.00
395	J-259	580,335.37	5,931,450.69	710.00	1.44	71.30	760.20
396	J-3	579,802.82	5,931,225.65	706.10	1.08	79.70	762.23
397	J-85	582,115.29	5,934,881.39	660.25	1.14	79.00	715.91
398	J-71	580,907.63	5,935,126.70	655.00	0.13	86.30	715.79
399	J-116	585,011.03	5,936,214.00	665.00	0.13	76.60	719.00
400	J-167	583,523.26	5,933,883.17	694.49	0	70.90	744.45
401	J-70	580,800.35	5,935,056.62	655.00	0.13	86.30	715.79
402	J-43	581,021.33	5,931,478.00	710.00	0	71.40	760.31
403	J-179	582,955.94	5,933,296.73	695.00	0	70.30	744.51
406	J-224	582,174.13	5,932,629.80	705.00	0.96	56.20	744.57
407	J-35	581,249.48	5,930,968.71	712.31	0	68.00	760.20
408	J-145	584,444.72	5,934,995.00	679.73	0	75.20	732.70
409	J-170	583,875.75	5,934,103.79	694.22	0	54.70	732.74
410	J-228	582,556.63	5,932,642.20	708.46	0.6	51.30	744.57
411	J-15	580,429.24	5,931,386.27	710.00	0.72	71.40	760.27
412	eson Zo	581,783.00	5,931,386.36	710.00	0.96	72.40	760.99
413	J-262	580,997.23	5,933,183.46	691.01	0	75.80	744.40
414	J-76	581,080.70	5,934,784.85	659.39	0	80.20	715.87
415	J-82	581,851.29	5,934,868.21	661.29	0	77.50	715.90
416	J-187	582,195.09	5,933,525.99	685.61	0.24	83.60	744.50
417	J-124	584,883.57	5,935,380.79	675.00	0	62.50	719.01
418	J-86	582,250.40	5,934,884.38	660.62	0.08	78.50	715.92
419	J-101	584,926.98	5,936,225.99	665.00	0.17	76.60	719.00
420	J-140	584,498.38	5,935,323.83	675.17	0.08	81.60	732.68
422	J-198	581,719.60	5,933,471.45	685.00	2.65	84.30	744.37
423	J-248	581,903.32	5,932,070.50	710.80	0	71.70	761.29
424	J-247	581,891.92	5,931,996.23	710.54	0	72.20	761.39
426	J-5	579,945.61	5,931,212.07	706.57	0	78.10	761.61
427	J-171	583,770.32	5,934,494.96	687.57	0.13	64.10	732.75
428	J-22	580,670.19	5,931,024.49	710.00	0.12	71.40	760.27
429	J-16	580,476.44	5,931,406.30	710.00	0	71.40	760.27
430	J-184	582,112.89	5,933,307.91	690.00	0.36	77.40	744.50
431	J-57	581,518.38	5,931,364.91	710.00	0	71.80	760.61
432	J-11	580,115.27	5,931,356.66	710.00	0.84	71.70	760.49
433	J-467	580,945.04	5,932,670.20	698.68	1.44	65.00	744.46
434	J-127	584,738.45	5,935,230.24	678.28	0.13	77.20	732.69
435	J-20	580,457.07	5,931,080.27	710.00	0.12	71.40	760.30
436	J-172	583,827.64	5,934,460.07	688.49	0.13	62.80	732.75

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437	J-157	584,429.91	5,934,843.88	686.75	0.04	65.30	732.72
438	J-161	583,932.31	5,934,795.27	682.13	0	71.80	732.75
439	J-114	584,722.31	5,935,766.42	668.89	0.01	71.10	719.00
440	J-149	584,407.51	5,934,758.25	688.05	0.08	63.40	732.71
441	akeshor	584,613.31	5,935,863.83	662.35	0.21	80.40	719.00
442	J-257	580,273.72	5,935,345.33	655.00	0.04	86.20	715.69
443	J-155	584,414.29	5,934,584.64	689.82	0.08	60.90	732.71
444	0 (Dumr	581,734.36	5,934,653.26	664.25	2.86	73.30	715.90
445	J-125	580,796.41	5,934,677.05	660.00	0.17	79.20	715.81
446	J-193	580,848.07	5,934,368.52	665.00	0.13	72.10	715.81
447	J-194	580,976.24	5,934,190.14	670.34	0.13	64.60	715.82
448	J-209	580,970.10	5,934,678.48	660.00	0.13	79.20	715.81
449	J-214	580,690.97	5,934,694.14	660.00	0	79.20	715.81
450	J-215	580,690.08	5,934,275.57	666.57	0	69.90	715.78
451	J-216	580,551.33	5,931,612.96	710.00	0	71.40	760.30
452	J-274	580,878.67	5,934,350.62	665.00	0	72.10	715.82
453	J-275	582,747.60	5,932,645.50	707.89	0.12	52.10	744.57
454	J-276	582,369.34	5,933,528.13	687.83	0.12	80.40	744.50
455	J-277	582,535.87	5,933,574.49	689.17	0.12	78.50	744.50
456	J-278	582,252.25	5,931,642.45	710.00	0	77.20	764.38
457	79 (Dum	582,429.55	5,931,644.90	712.34	8.18	75.30	765.39
458	J-280	582,657.75	5,931,650.26	715.00	2.53	73.70	766.94
460	J-317	582,199.34	5,932,409.79	709.00	0	50.50	744.57
461	preme S	579,529.45	5,930,618.12	710.00	0	73.70	761.89
462	J-369	580,329.98	5,930,530.83	711.57	0.24	68.90	760.08
463	J-413	584,962.80	5,935,893.67	667.76	0	72.70	719.00
464	J-414	580,992.55	5,933,333.24	690.00	0.12	77.20	744.37
465	J-415	580,322.26	5,930,836.93	709.65	0	71.80	760.21
466	J-416	580,996.56	5,933,257.52	690.00	0	77.20	744.38
467	J-417	581,409.37	5,930,749.49	710.00	0	71.20	760.13
468	J-418	581,473.62	5,930,748.31	710.00	0	71.20	760.13
469	J-426	581,027.60	5,931,617.03	710.00	0	71.50	760.36
470	J-427	581,474.51	5,931,632.42	711.07	1.2	70.50	760.72
472	J-433	581,230.40	5,931,623.34	710.40	0.12	71.00	760.39
473	J-455	585,032.66	5,934,913.17	682.73	0.04	70.90	732.70
474	J-456	584,578.32	5,935,458.14	674.14	0	63.70	719.01
475	J-457	584,473.57	5,935,561.72	668.91	0.08	71.10	719.01
476	J-458	584,552.88	5,935,630.17	668.40	0.04	71.80	719.01
477	J-459	584,630.33	5,935,622.09	670.00	0	69.60	719.01
478	J-460	584,399.04	5,935,479.51	669.91	0.04	69.70	719.01
479	J-462	584,407.26	5,935,625.71	666.69	0.04	74.30	719.01
480	J-473	584,318.20	5,935,632.34	665.00	0	76.70	719.01
481	J-474	580,907.43	5,933,564.98	687.95	0	80.00	744.33
482	J-475	584,394.68	5,934,582.93	689.24	0	61.70	732.71
483	J-476	584,378.97	5,934,558.28	688.81	0	62.30	732.71
484	J-477	584,385.26	5,934,422.76	691.17	0.17	59.00	732.71
485	J-478	584,452.79	5,934,337.14	695.00	0.05	53.50	732.71

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486	J-479	584,456.37	5,934,203.11	695.00	0	53.50	732.71
487	J-480	584,346.35	5,934,199.50	695.00	0.08	53.50	732.71
488	untry Sq	584,451.06	5,934,432.27	692.57	0.01	57.00	732.71
489	J-482	584,501.53	5,934,435.28	693.17	0	56.10	732.71
490	J-483	582,554.17	5,934,938.61	663.74	0	74.10	715.95
491	J-484	580,257.71	5,934,709.77	655.00	0.08	86.20	715.70
492	J-485	580,164.03	5,934,700.83	655.00	0.04	86.20	715.70
493	Greenbria	580,160.09	5,934,602.78	655.28	0.17	85.80	715.71
494	J-487	580,157.19	5,934,461.58	658.62	0.04	81.00	715.71
495	J-488	580,264.39	5,934,426.70	660.00	0	79.10	715.71
496	J-489	580,262.15	5,934,273.16	662.79	0.04	75.10	715.72
497	J-490	580,263.09	5,934,169.52	664.93	0.47	72.10	715.72
498	J-491	580,263.09	5,934,052.82	668.12	0	67.60	715.71
499	J-492	580,603.96	5,933,233.91	687.77	0.24	80.40	744.39
500	J-493	580,285.22	5,933,229.98	685.12	0	84.10	744.38
501	J-494	580,019.98	5,933,222.44	681.92	0	88.60	744.37
502	J-496	579,846.07	5,933,216.09	683.33	0	86.60	744.35
503	J-497	579,558.48	5,933,207.86	680.78	2.17	90.20	744.34
504	J-498	579,384.04	5,933,248.61	680.76	0	90.20	744.33
505	J-499	580,585.32	5,935,532.59	655.00	0.13	86.20	715.69
506	J-500	580,800.29	5,934,469.04	664.91	0.13	72.30	715.81
507	Panatton	580,493.51	5,932,097.85	705.00	1.69	56.50	744.79
508	J-502	581,171.70	5,934,953.60	655.96	0.08	85.00	715.86
509	J-503	581,266.41	5,934,961.33	656.39	0.13	84.40	715.86
510	J-504	581,381.72	5,934,985.17	655.83	0.13	85.20	715.87
511	J-505	581,484.80	5,934,976.15	656.63	0.17	84.10	715.87
512	J-506	581,091.17	5,935,043.79	655.00	0.13	86.40	715.85
513	J-507	581,089.89	5,935,190.68	655.00	0.13	86.40	715.85
514	J-508	580,357.88	5,929,962.29	715.00	0	63.70	759.88
515	J-510	582,422.00	5,934,645.84	669.74	0	65.60	715.93
516	J-511	582,750.31	5,934,542.81	677.72	4.47	54.30	715.95
518	J-338	584,547.50	5,934,594.73	690.00	0.07	60.60	732.71
519	J-339	584,844.68	5,934,804.41	685.00	0.17	67.70	732.70
520	J-340	584,755.52	5,934,642.61	690.00	0.42	60.60	732.70
521	J-341	584,801.75	5,934,584.83	690.00	0.08	60.60	732.70
522	J-342	584,626.74	5,934,593.08	689.17	0	61.80	732.70
523	J-343	584,630.05	5,934,465.96	690.99	0.25	59.20	732.70
524	J-344	584,677.93	5,934,368.55	692.43	0	57.20	732.70
525	J-345	584,719.20	5,934,290.95	693.49	0.21	55.70	732.70
526	J-346	584,743.41	5,934,208.42	694.61	0	54.10	732.71
527	J-347	579,821.81	5,934,839.28	655.41	0.66	85.50	715.67
528	J-348	579,906.54	5,934,628.04	660.00	0.38	79.00	715.66
529	J-349	579,552.52	5,934,390.76	660.66	0.13	78.10	715.66
530	J-350	579,560.18	5,934,186.05	665.00	0	71.90	715.66
531	J-351	579,798.46	5,934,185.19	665.00	1.19	71.90	715.67
532	J-352	580,053.20	5,934,194.89	663.47	0	74.10	715.69
533	J-353	580,058.17	5,934,050.10	666.33	0	70.10	715.70

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
534	J-354	580,312.61	5,932,449.20	700.00	0	63.30	744.57
535	J-355	580,307.45	5,932,622.04	699.36	0	64.00	744.43
536	J-356	579,997.89	5,932,624.62	692.45	0	73.60	744.30
537	J-357	579,512.91	5,932,611.72	692.30	0	73.50	744.10
538	J-358	579,102.08	5,932,475.53	690.19	14.26	76.30	743.91
539	J-359	578,692.37	5,932,179.56	695.00	13.35	69.40	743.87
540	J-360	578,697.01	5,931,540.09	705.00	0	79.30	760.88
541	J-361	578,222.97	5,931,414.90	701.79	5.35	59.20	743.50
542	J-362	576,685.76	5,931,405.43	691.85	5.08	71.40	742.12
543	J-363	576,670.09	5,932,150.71	682.23	13.38	84.70	741.87
544	J-364	576,660.70	5,932,987.81	672.00	20.19	62.20	715.83
545	J-365	577,479.18	5,932,164.91	680.63	13.38	87.80	742.51
546	J-367	578,717.06	5,934,829.40	659.32	0.26	79.90	715.62
547	J-368	578,225.64	5,934,575.53	657.00	3.21	83.20	715.61
548	J-370	577,055.12	5,934,577.33	660.00	3.48	78.90	715.60
549	J-371	579,058.45	5,934,237.94	663.97	0	73.40	715.65
550	J-372	582,913.82	5,934,492.65	678.92	0	52.60	715.98
551	J-373	583,715.84	5,934,179.49	692.83	0	56.70	732.75
552	J-374	583,711.11	5,934,323.53	691.08	0.24	59.20	732.75
553	J-375	583,617.79	5,934,384.39	690.00	0	60.70	732.76
554	J-376	583,516.06	5,934,862.86	676.07	0.32	79.90	732.35
555	J-377	583,509.18	5,935,200.72	667.03	0	92.10	731.94
556	J-378	583,929.49	5,935,204.80	671.35	1.85	85.90	731.85
557	J-379	583,908.95	5,935,493.03	665.29	1.8	76.30	719.01
558	J-380	584,314.82	5,935,494.87	667.94	0	72.50	719.01
559	J-381	582,697.16	5,935,191.31	659.04	0	80.80	715.99
560	J-382	583,041.84	5,935,201.63	664.23	0	73.50	716.03
561	J-384	584,690.83	5,933,525.77	696.39	3	68.50	744.64
562	J-385	584,716.16	5,932,759.41	700.00	9.2	63.60	744.84
563	J-386	584,750.39	5,931,678.72	704.69	12.44	75.90	758.15
564	J-387	583,563.61	5,931,658.08	713.93	0	64.50	759.38
565	J-388	583,543.54	5,932,874.51	705.00	0	56.40	744.73
566	J-389	583,975.37	5,932,756.68	705.00	8.06	56.50	744.79
567	J-390	581,655.30	5,929,996.66	715.00	1.08	64.00	760.08
568	91 (Dum	580,970.38	5,929,997.16	715.00	8.18	63.60	759.80
569	J-392	580,813.36	5,929,007.00	720.00	0.12	55.40	759.00
570	J-393	581,663.98	5,929,028.48	715.00	54.64	62.30	758.88
571	J-394	581,271.76	5,928,382.80	719.00	4.01	56.60	758.86
572	J-395	580,870.63	5,928,007.60	715.77	5.77	61.10	758.83
573	J-396	579,994.03	5,927,974.61	710.79	11.1	68.10	758.79
574	J-397	579,174.48	5,927,957.46	715.00	13.46	62.20	758.79
575	J-398	579,153.39	5,928,768.73	712.26	10.28	66.30	758.97
576	J-399	579,124.50	5,929,557.08	715.00	13.47	63.40	759.65
577	J-400	579,105.90	5,930,558.91	710.00	7.59	72.90	761.33
578	J-401	579,838.42	5,929,089.06	711.05	13.13	68.20	759.10
579	J-402	582,479.98	5,930,426.58	717.66	0	59.80	759.82
580	J-403	583,291.35	5,930,024.89	715.00	0	62.20	758.85

ID	Label	Easting (m)	Northing (m)	Elevation (m)	Demand (L/s)	Pressure (kPa)	Hydraulic Grade (m)
581	J-404	584,008.12	5,930,317.94	710.00	12.89	68.90	758.53
582	J-406	584,887.98	5,930,054.27	710.00	13.46	68.60	758.34
583	J-407	584,895.38	5,929,247.13	710.00	13.49	68.60	758.34
584	J-408	584,916.02	5,928,301.28	710.00	5.79	68.70	758.40
585	J-409	584,067.45	5,928,313.11	710.00	6.45	68.70	758.43
586	J-410	583,221.53	5,928,298.46	717.75	6.77	57.90	758.52
587	J-411	582,457.82	5,928,275.54	720.00	3.85	54.90	758.68
588	J-412	582,422.40	5,929,556.63	716.72	6.29	60.00	759.00
589	J-420	583,620.42	5,929,590.40	716.07	13.27	60.30	758.51
590	J-421	583,218.17	5,929,151.91	715.00	0	61.90	758.63
591	J-422	582,450.12	5,928,880.13	715.00	0	62.20	758.83
592	J-423	584,057.49	5,929,227.06	710.00	13.45	68.70	758.37
593	J-424	581,660.97	5,929,623.62	713.50	0.36	65.70	759.81
594	J-425	581,665.24	5,929,366.79	715.00	0	62.90	759.30
596	J-429	584,050.71	5,934,639.34	683.04	0.53	70.50	732.74
597	J-430	584,216.79	5,934,482.79	688.98	0.68	62.10	732.71
598	J-431	584,057.80	5,934,105.74	690.03	0.04	60.60	732.73
600	J-435	584,997.94	5,934,344.14	690.00	0.78	60.60	732.70
601	J-436	585,098.32	5,934,735.10	689.76	0	61.00	732.70
602	J-437	584,749.37	5,934,767.29	686.86	0	65.10	732.71
603	J-438	584,571.05	5,934,804.08	690.00	0.08	60.60	732.71
604	J-439	580,563.59	5,929,433.52	710.00	5.13	70.70	759.78
605	J-440	577,488.21	5,931,964.01	685.04	0	81.60	742.52
606	J-441	577,498.53	5,931,408.86	695.00	7.91	67.50	742.55
607	J-442	578,704.52	5,935,246.24	656.72	2.36	83.60	715.62
609	J-444	582,796.35	5,930,027.09	720.00	9.73	55.60	759.18
610	J-445	577,047.21	5,933,899.96	663.15	13.36	74.50	715.61
614	J-449	581,421.38	5,932,595.83	704.53	2.53	56.70	744.50
615	J-450	579,529.68	5,930,833.39	710.00	0	74.40	762.39
616	J-451	582,718.01	5,933,794.15	686.82	0.96	81.80	744.47
617	J-452	584,568.62	5,934,437.45	692.38	0.29	57.20	732.70
618	J-453	584,709.29	5,934,821.05	685.00	0.25	67.70	732.71
619	J-454	578,967.63	5,931,180.10	705.00	1.08	92.10	769.86
620	J-463	579,109.34	5,929,955.19	715.00	5.56	64.50	760.47
621	J-481	579,912.34	5,929,983.06	710.05	1.44	71.80	760.63
623	J-495	581,742.29	5,930,634.26	710.00	0	71.10	760.10
624	J-514	581,024.45	5,930,758.71	710.00	0.48	71.20	760.14
625	J-509	582,414.25	5,929,796.24	715.00	7.41	62.60	759.09
1202	J-515	581,712.08	5,932,708.51	700.00	0.6	63.10	744.47
1205	J-516	581,669.94	5,929,192.84	715.00	0	62.40	758.96
1210	J-518	581,830.29	5,929,625.08	715.00	0	63.60	759.81
1212	J-519	581,835.07	5,929,999.06	715.66	0	63.00	760.08
1215	J-520	583,628.60	5,934,178.46	691.55	0	58.50	732.75
1217	J-521	579,709.90	5,934,475.78	661.19	0	77.3	715.66
1221	J-523	579,612.49	5,934,670.51	660	0	79	715.66
1223	J-524	579,458.36	5,934,392.85	660	0	79	715.66
1225	J-525	579,864.05	5,934,327.41	663.27	0	74.4	715.67

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1247	J-529	581,722.82	5,930,546.21	711.81	0	68.5	760.09
1250	J-530	581,718.67	5,930,439.72	715	0	64	760.09
1252	J-531	581,695.54	5,930,265.84	715	0	64	760.09
1254	J-532	581,651.35	5,930,158.96	715	0	64	760.08
1261	J-535	580,317.76	5,932,082.48	705	0	56.6	744.87
1266	J-536	579,735.35	5,931,890.66	705.76	7.45	76.9	759.92
1268	J-537	579,384.24	5,931,741.18	705	0.23	78.3	760.17
1272	J-539	579,340.40	5,932,056.77	700	4.94	85.4	760.16
1274	J-540	579,699.30	5,932,009.28	700.12	0	84.9	759.92
1276	J-541	579,799.44	5,931,732.09	706.82	0	75.4	759.91
1279	J-542	580,321.43	5,931,912.84	706.22	0	76.1	759.8
1289	J-546	579,073.46	5,931,613.43	705	2.52	78.7	760.48
1293	J-547	580,088.01	5,932,060.24	705.55	0	77.1	759.87
1303	J-550	579,304.34	5,931,106.29	705.49	0	85.5	765.76
1308	J-552	581,774.56	5,934,875.22	660.36	0.04	78.8	715.9
1310	J-553	584,830.76	5,934,337.70	691.53	0	58.4	732.7
1313	J-554	581,603.99	5,933,308.60	689.95	0	77.3	744.4
1317	J-555	581,321.58	5,933,537.76	685.33	0	83.7	744.31
1320	J-556	581,323.99	5,933,415.23	687.59	0	80.5	744.31
1322	J-557	581,250.04	5,933,467.96	686.55	0	82	744.31
1323	J-558	581,327.56	5,933,467.96	686.59	0	81.9	744.31
1330	J-560	584,062.95	5,933,663.17	698.76	1.44	65	744.55
1333	J-561	582,080.53	5,931,638.76	710	0	75.8	763.39
1336	J-562	582,569.27	5,933,781.52	685	0.12	84.4	744.48
1339	J-563	583,023.88	5,933,806.52	689.56	3.25	77.9	744.45
1342	J-564	583,338.73	5,933,881.24	692.98	0	73.1	744.45
1345	J-565	582,744.06	5,932,889.49	701.99	0	60.4	744.57
1348	J-566	582,939.07	5,932,645.59	708.52	0.12	51.2	744.58
1351	J-567	583,002.33	5,932,556.57	709	0.12	50.5	744.58
1353	J-568	581,247.75	5,932,942.22	695.05	0	70.1	744.45
1356	J-569	580,577.37	5,932,096.86	705.31	0	56	744.76
1359	J-570	580,889.17	5,932,276.53	705.71	0	55.2	744.61
1362	J-571	580,880.65	5,932,177.12	706.82	0	53.7	744.65
1366	J-573	579,703.90	5,930,618.74	710	0.6	73.3	761.67
1369	J-574	579,904.79	5,930,431.14	710	0	72.7	761.19
1372	J-575	580,334.11	5,930,381.44	712.92	0	66.9	760.03
1375	J-576	581,433.82	5,929,694.07	715	5.41	63.6	759.8
1385	J-577	578,886.69	5,931,210.46	705	0	89.6	768.12
1387	J-578	580,835.80	5,932,122.19	707.37	0	52.9	744.67
1390	J-579	579,380.19	5,933,203.20	681.18	0	89.6	744.33
1395	J-582	579,207.27	5,933,179.51	680.57	3.34	90.5	744.33
1399	J-584	583,409.70	5,930,823.23	715	0	62	758.67
1401	J-585	583,613.66	5,930,025.23	708.86	0	70.7	758.64
1405	J-586	581,295.24	5,929,939.38	715	0.36	63.6	759.8
1410	J-588	582,796.31	5,931,225.82	716.44	1.2	68.9	764.97
1422	J-590	582,460.14	5,928,520.74	720	11.82	55	758.75
1425	J-591	583,549.35	5,932,202.80	710	10.36	69.3	758.79

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1428	J-592	578,708.52	5,931,205.20	706.2	1.71	82.8	764.54
1435	J-595	577,630.09	5,930,951.63	701.67	9.18	86.3	762.45
1437	J-596	577,630.09	5,930,329.83	710	12.47	73.5	761.75
1442	J-598	578,276.18	5,930,332.49	710	12.96	73	761.43
1445	J-599	578,408.19	5,931,119.25	707.61	0	80	763.95
1449	J-601	579,260.41	5,934,216.98	664.6	2.2	72.5	715.65
1452	J-602	579,239.65	5,934,831.22	656.38	0	84.1	715.65
1459	J-604	580,481.32	5,934,271.82	664.6	2.21	72.6	715.75
1462	J-605	581,613.21	5,934,259.07	671.37	1.26	63.2	715.91
1466	J-606	582,281.16	5,931,229.50	710	7.46	76.7	764.02
1473	J-607	579,543.45	5,929,983.64	715	0	64.7	760.56
1475	J-608	580,203.48	5,929,958.96	713.28	0	66.9	760.38
1478	J-609	580,201.01	5,929,860.38	713.35	0	66.8	760.38
1480	J-610	580,552.48	5,929,989.36	715	2.29	63.6	759.81
1483	J-611	580,325.86	5,930,727.51	710	0	71.2	760.16
1499	J-613	584,353.40	5,933,669.57	695.76	8.61	69.3	744.57
1504	J-614	582,934.11	5,932,889.06	702.94	0	59.1	744.59
1521	J-617	576,696.06	5,930,806.93	697.46	2.49	92.2	762.44
1526	J-619	583,965.70	5,931,182.45	713.27	6.21	64.2	758.49
1529	J-620	583,426.67	5,930,620.38	719.95	0	55	758.67
1538	J-621	578,694.88	5,931,642.14	700.74	0	62.4	744.69
1542	J-622	584,014.70	5,930,037.23	715	0	61.8	758.53
1545	J-623	579,142.16	5,929,148.03	715	0	62.7	759.19
1548	J-624	580,979.44	5,929,436.53	710	7.55	70.7	759.78
1552	J-626	582,439.40	5,929,055.55	714.43	0	63.1	758.86
1556	J-628	580,375.92	5,929,164.92	717.44	0	59.3	759.23
1559	J-629	580,365.57	5,929,526.73	705	0	77.4	759.53
1563	J-631	580,387.52	5,927,986.11	715	1.11	62.2	758.83
1604	J-632	580,288.92	5,933,147.51	687.49	0	80.8	744.39
1619	J-634	580,375.70	5,929,000.34	718.77	0	57.2	759.1
1623	J-635	582,786.29	5,930,481.33	720	12.15	57	760.16
1634	J-637	578,683.08	5,932,473.92	690.87	0	75.3	743.89
1681	J-642	581,668.12	5,929,095.99	715	0	62.3	758.92
1711	J-644	583,046.25	5,935,496.03	657.92	2.32	82.5	716.02
1741	J-647	581,271.30	5,929,015.97	720	0	55.2	758.91
1744	48 (Dum	581,275.92	5,928,657.02	720	8.18	55.2	758.9
1746	J-649	581,116.31	5,928,684.12	720	0	55.2	758.9
1748	J-650	581,110.60	5,929,012.69	721.17	0	53.6	758.93
1857	J-662	581,970.85	5,935,022.33	659.84	0.12	79.6	715.9
1859	J-663	582,116.21	5,935,056.50	657.14	0.15	83.4	715.91
1930	J-668	579,102.84	5,931,112.30	705.76	0.75	88.5	768.12
1933	J-669	583,535.99	5,932,752.55	705	5.4	56.6	744.84
1936	J-670	583,961.86	5,933,365.46	700	2.81	63.4	744.64
1938	J-671	583,518.52	5,931,175.41	715	5.95	62.1	758.73
1941	J-672	584,343.63	5,931,657.91	705	6.09	75.7	758.34
1944	J-673	580,373.82	5,928,781.54	710.94	1	68.3	759.03
1947	J-674	584,337.86	5,932,018.97	706.68	11.59	73.6	758.5

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1949	J-675	579,907.29	5,930,219.27	710	1.5	72.3	760.92
1952	J-676	580,043.39	5,929,961.76	711.5	0.46	69.6	760.51
1955	J-677	581,118.82	5,928,478.68	720	4.21	55.2	758.89
1956	J-678	580,803.49	5,928,525.59	713.58	0	64.3	758.89
1957	J-679	580,802.56	5,928,372.79	716.43	0	60.3	758.88
1959	J-681	580,378.87	5,928,367.84	710	0	69.4	758.9
1965	J-682	578,966.18	5,934,323.21	662.52	0.57	75.4	715.64
1969	J-683	580,796.56	5,933,569.23	687.51	2.89	80.7	744.33
1970	J-684	580,269.86	5,933,725.09	675.19	1.28	98.2	744.38
1974	J-685	580,448.50	5,933,230.44	686.51	3.37	82.2	744.39
1977	J-686	580,280.05	5,933,437.59	680.95	1.69	90	744.38
1980	J-687	580,334.63	5,930,185.02	714.34	0.32	64.8	759.96
1983	J-688	580,557.45	5,930,744.75	710	0.46	71.2	760.14
1986	J-689	581,209.13	5,929,990.60	715	1.2	63.6	759.8
1989	J-690	582,115.87	5,934,642.64	664.96	1.11	72.3	715.91
1995	J-692	580,367.90	5,935,411.75	655	0.57	86.2	715.69
1998	J-693	580,939.14	5,935,207.44	655	0.09	86.3	715.79
2001	J-694	581,593.23	5,933,015.33	699.23	1.25	64.2	744.44
2004	J-695	581,706.64	5,932,861.89	698.36	1.5	65.4	744.45
2007	J-696	585,110.51	5,930,733.81	710	0	69	758.6
2009	J-697	580,594.61	5,929,003.29	722.94	1.84	51.3	759.05
2012	J-698	579,772.86	5,930,616.65	710	0.33	73.2	761.58
2015	J-699	581,656.96	5,929,786.31	715	0.18	63.8	759.93
2020	J-700	584,566.88	5,934,158.53	695	0.25	53.5	732.71
2024	J-701	579,705.90	5,933,212.88	682	2.69	88.5	744.34
2027	J-702	582,798.78	5,931,094.66	716	5.9	69.1	764.71
2030	J-703	583,042.23	5,935,001.28	669.77	1.84	65.7	716.03
2033	J-704	581,714.42	5,934,441.08	668.91	0	66.7	715.9
2038	J-705	580,902.73	5,927,660.12	715	0	62.1	758.75
2039	J-706	583,647.50	5,927,753.89	710	0	68.8	758.5
2040	J-707	580,267.35	5,933,787.67	674.05	0	99.8	744.38
2045	J-708	583,620.77	5,928,790.07	715	0	61.8	758.5
2048	J-709	584,218.05	5,933,682.14	696.07	0	68.8	744.56
2051	J-710	584,263.37	5,932,753.23	704.52	0	57.2	744.81
2054	J-711	584,752.84	5,931,333.50	708	0	71.3	758.23
2062	J-712	584,428.67	5,927,760.57	710	0	68.8	758.46
2064	J-713	584,319.60	5,931,332.55	708.64	0	70.5	758.34
2071	J-715	583,984.76	5,930,837.44	713.33	0	64.3	758.6
2087	J-716	583,622.05	5,929,187.03	712.59	0	65.2	758.51
2090	J-717	583,632.05	5,928,302.37	713.99	0	63.2	758.5
2093	J-718	583,981.82	5,932,017.05	712	0	66.4	758.79
2142	J-719	582,112.92	5,929,042.77	714.67	0	62.7	758.87
2145	J-720	581,900.54	5,929,036.19	714.83	0	62.5	758.88
2148	J-721	585,115.48	5,935,430.98	672.05	0	66.6	719
2153	J-723	581,364.59	5,933,637.12	683.4	0	86.4	744.3
2155	J-724	581,503.77	5,933,636.39	683.4	0	86.4	744.28
2157	J-725	581,505.07	5,933,898.96	680	0	91.2	744.26

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
654	P-120	J-102	J-116	63.00	200	120.00	-0.01	0	0	0	PVC
655	P-156	J-147	J-148	80.00	200	120.00	1.64	0.05	0.002	0.026	PVC
656	P-78	J-73	J-74	58.00	200	120.00	-4.82	0.15	0.011	0.195	PVC
657	P-95	J-90	J-91	95.00	200	120.00	-3.86	0.12	0.012	0.13	PVC
658	P-74	J-69	J-70	140.00	200	120.00	-4.21	0.13	0.021	0.152	PVC
659	P-201	J-191	J-192	96.00	300	120.00	-18.98	0.27	0.033	0.343	PVC
660	P-5	J-5	J-7	173.00	200	120.00	30.09	0.96	1.004	5.809	PVC
661	P-119	J-115	J-109	130.00	200	120.00	1.10	0.03	0.002	0.013	PVC
662	P-307(2)	J-471	J-470	147.00	300	120.00	-9.07	0.13	0.013	0.087	PVC
663	P-216	J-205	J-206	353.00	300	120.00	-12.41	0.18	0.04	0.156	PVC
664	P-124	J-119	J-110	95.00	200	120.00	0.38	0.01	0	0.002	PVC
665	P-17	J-17	J-18	122.00	300	110.00	2.74	0.04	0.001	0.011	Asbestos Cement
666	P-11	J-11	J-12	113.00	300	120.00	31.79	0.45	0.094	0.892	PVC
667	P-73	J-68	J-69	169.00	200	120.00	-4.05	0.13	0.024	0.141	PVC
668	P-235	J-223	J-224	98.00	300	120.00	-10.66	0.15	0.012	0.118	PVC
669	P-46	J-44	J-45	77.00	300	110.00	7.35	0.1	0.006	0.069	Asbestos Cement
670	P-152	J-131	J-145	12.00	200	120.00	-2.19	0.07	0.001	0.045	PVC
671	P-141	J-134	J-135	126.00	150	120.00	0.24	0.01	0	0.003	PVC
672	P-30	J-28	J-29	73.00	300	110.00	5.70	0.08	0.003	0.043	Asbestos Cement
673	P-195	J-185	J-186	131.00	300	120.00	1.37	0.02	0	0.002	PVC
674	P-306(2)	J-472	J-471	85.00	300	120.00	-9.07	0.13	0.005	0.087	PVC
675	P-215	J-204	J-205	197.00	300	120.00	-12.41	0.18	0.031	0.156	PVC
676	P-159	J-150	J-151	35.00	200	120.00	0.30	0.01	0	0.002	PVC
677	P-16	J-13	J-17	156.00	300	110.00	2.74	0.04	0.002	0.011	Asbestos Cement
678	P-160	J-151	J-152	71.00	200	120.00	0.22	0.01	0	0	PVC
679	P-110	J-106	J-107	37.00	200	120.00	-0.08	0	0	0	PVC
680	P-10	J-10	J-11	167.00	300	120.00	32.63	0.46	0.164	0.937	PVC
681	P-234	J-222	J-223	81.00	300	120.00	-10.66	0.15	0.01	0.118	PVC
682	P-72	J-67	J-58	158.00	300	110.00	43.08	0.61	0.304	1.841	Asbestos Cement
683	P-135	J-128	J-129	126.00	150	120.00	0.23	0.01	0	0.002	PVC
684	P-26	J-25 (Dummy)	J-26	119.00	300	110.00	-5.90	0.08	0.006	0.046	Asbestos Cement
685	P-172	J-162	J-163	145.00	300	120.00	-6.33	0.09	0.007	0.045	PVC
686	P-140	J-133	J-134	114.00	200	120.00	0.37	0.01	0	0.002	PVC
687	P-158	J-149	J-150	30.00	200	120.00	0.30	0.01	0	0	PVC
688	P-52	J-49	J-50	146.00	300	110.00	8.29	0.12	0.013	0.087	Asbestos Cement
689	P-148	J-129	J-141	83.00	150	120.00	0.00	0	0	0	PVC
690	P-182	J-173	J-174	102.00	200	120.00	1.11	0.04	0.001	0.013	PVC
691	P-282	J-252	J-253	357.00	300	120.00	-1.86	0.03	0.002	0.005	HDPE
692	P-217	J-206	J-207	75.00	300	120.00	-22.44	0.32	0.078	0.468	PVC
693	P-15	J-15	J-16	51.00	300	110.00	-4.65	0.07	0.001	0.029	Asbestos Cement
694	P-109	J-99	J-106	76.00	200	120.00	0.05	0	0	0	PVC
695	P-142	J-135	J-136	88.00	200	120.00	1.67	0.05	0.002	0.028	PVC
696	P-181	J-172	J-173	65.00	200	120.00	2.43	0.08	0.004	0.055	PVC
697	P-71	J-66	J-67	156.00	300	110.00	43.08	0.61	0.272	1.841	Asbestos Cement
698	P-193	J-183	J-184	75.00	300	120.00	3.17	0.04	0.001	0.013	PVC
699	P-238	J-226	J-227	86.00	300	120.00	-1.82	0.03	0.001	0.005	PVC
700	P-157	J-148	J-149	48.00	200	120.00	0.77	0.02	0	0.008	PVC
701	P-75	J-70	J-71	128.00	200	120.00	0.34	0.01	0	0.001	PVC
702	P-147	J-129	J-140	62.00	150	120.00	1.91	0.11	0.009	0.144	PVC
703	P-129	J-122	J-123	62.00	200	120.00	-0.80	0.03	0	0.007	PVC
704	P-92	J-87	J-88	83.00	200	120.00	-3.35	0.11	0.009	0.1	PVC
705	P-171	J-161	J-162	175.00	300	120.00	-6.33	0.09	0.008	0.045	PVC
706	P-206	J-196	J-197	78.00	300	120.00	-12.49	0.18	0.018	0.158	PVC
707	P-45	J-43	J-44	40.00	300	110.00	16.11	0.23	0.012	0.298	Asbestos Cement
708	P-258	PMP-101	J-234	2.00	150	120.00	0.00	0	0	0	PVC
709	P-276	J-248	J-211	11.00	300	120.00	40.36	0.57	0.038	1.389	PVC
710	P-189	J-179	J-180 (Dummy)	237.00	350	120.00	3.29	0.03	0.001	0.006	PVC
711	P-33	J-31	J-32	76.00	300	110.00	13.62	0.19	0.017	0.219	Asbestos Cement
712	P-84	J-79	J-80 (Dummy)	386.00	250	120.00	-3.99	0.08	0.018	0.047	PVC
713	P-255	PMP-104	J-237	2.00	250	120.00	0.00	0	0	0	PVC
714	P-29	J-27	J-28	77.00	300	110.00	5.70	0.08	0.003	0.043	Asbestos Cement
715	P-118	J-114	J-115	108.00	200	120.00	1.18	0.04	0.001	0.014	PVC
716	P-9	J-5	J-10	137.00	200	120.00	33.36	1.06	0.954	7.031	PVC
718	P-229	J-217	J-218	31.00	300	120.00	-85.95	1.22	0.175	5.63	PVC
719	P-265	J-241	PMP-103	2.00	600	120.00	0.00	0	0	0	PVC
720	P-210	J-200	J-201	211.00	300	120.00	-17.71	0.25	0.064	0.302	PVC
721	P-232	J-220	J-221	94.00	300	120.00	-10.66	0.15	0.011	0.117	PVC
722	P-32	J-30	J-31	86.00	300	110.00	5.34	0.08	0.003	0.038	Asbestos Cement
723	P-108	J-96	J-105	160.00	200	120.00	0.21	0.01	0	0.001	PVC
724	P-133	J-126	J-127	125.00	150	120.00	0.65	0.04	0.002	0.02	PVC
725	P-174	J-164	J-165	87.00	300	120.00	-11.33	0.16	0.011	0.132	PVC
726	P-134	J-127	J-128	116.00	150	120.00	0.52	0.03	0.001	0.013	PVC
727	P-190	J-180 (Dummy)	J-181	119.00	350	120.00	7.49	0.08	0.006	0.029	PVC
728	P-211	J-201	J-202	129.00	360	120.00	-6.14	0.06	0.002	0.018	HDPE
729	P-300	OLD FIRE PUMP	J-265	145.00	300	120.00	0.00	0	0	0	PVC
730	P-144	J-122	J-137	191.00	200	120.00	-0.82	0.03	0.001	0.007	PVC
731	P-231	J-219	J-220	100.00	300	120.00	-9.69	0.14	0.01	0.099	PVC
732	P-70	J-65	J-66	106.00	300	110.00	-29.17	0.41	0.1	0.895	Asbestos Cement
733	P-35	J-33	J-34	60.00	300	110.00	13.26	0.19	0.011	0.208	Asbestos Cement
734	P-117	J-113	J-114	51.00	200	120.00	-0.30	0.01	0	0	PVC
735	P-184	J-175	J-177	34.00	200	120.00	0.86	0.03	0	0.007	PVC
736	P-112	J-108	J-109	88.00	200	120.00	-0.12	0	0	0.001	PVC
737	P-150	J-141	J-143	23.00	150	120.00	0.00	0	0	0	PVC
738	P-177	J-167	J-168	458.00	300	120.00	-12.85	0.18	0.066	0.167	PVC
739	P-115	J-97	Lakeshore	143.00	200	120.00	-0.09	0	0	0	PVC
740	P-192	J-182	J-183	257.00	350	120.00	-0.02	0	0	0	PVC
741	P-251	J-235	J-236	2.00	400	120.00	0.00	0	0	0	PVC
742	P-68	J-63	Acheson Zone 3	124.00	300	110.00	-28.21	0.4	0.104	0.84	Asbestos Cement
743	P-309	J-469	J-468 (Dummy)	89.00	300	120.00	-9.07	0.13	0.008	0.087	PVC
744	P-146	J-128	J-139	63.00	150	120.00	0.13	0.01	0	0.001	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
745	P-97	J-93	J-94	73.00	200	120.00	0.69	0.02	0	0.006	PVC
746	P-237	J-224	J-226	96.00	300	120.00	-1.58	0.02	0	0.003	PVC
747	P-128	J-121	J-122	38.00	200	120.00	-1.54	0.05	0.001	0.024	PVC
748	P-22	J-21	J-22	200.00	300	110.00	8.58	0.12	0.019	0.093	Asbestos Cement
749	P-122	J-117	J-118	130.00	200	120.00	-0.26	0.01	0	0.001	PVC
750	P-230	J-183	J-219	149.00	300	120.00	-9.33	0.13	0.014	0.092	PVC
751	P-104	J-100	J-101	111.00	200	120.00	0.41	0.01	0	0.002	PVC
753	P-61	J-57	J-58	116.00	300	110.00	-10.18	0.14	0.016	0.127	Asbestos Cement
754	P-126	J-114	J-120	75.00	200	120.00	-1.49	0.05	0.002	0.023	PVC
755	P-28	J-22	J-27	72.00	300	110.00	6.06	0.09	0.004	0.049	Asbestos Cement
756	P-44	J-42	J-43	77.00	300	110.00	16.11	0.23	0.021	0.298	Asbestos Cement
757	P-197	J-187	J-188	74.00	300	120.00	1.13	0.02	0	0.002	PVC
758	P-20	J-19	J-20	49.00	300	110.00	9.18	0.13	0.006	0.105	Asbestos Cement
759	P-80	J-75	J-76	179.00	200	120.00	-3.08	0.1	0.015	0.085	PVC
760	P-261	J-241	J-242	2.00	600	120.00	0.00	0	0	0	PVC
761	P-298	J-234	J-265	2.00	300	120.00	0.00	0	0	0	PVC
762	P-102	J-98	J-99	87.00	200	120.00	0.96	0.03	0.001	0.01	PVC
763	P-254	J-238	PMP-105	2.00	250	120.00	0.00	0	0	0	PVC
764	P-291	J-192	J-264	218.00	300	120.00	-10.04	0.14	0.023	0.106	PVC
765	P-281	J-14	J-259	44.00	300	120.00	32.86	0.46	0.063	0.949	PVC
766	P-64	J-60	J-40	31.00	300	110.00	25.44	0.36	0.024	0.695	Asbestos Cement
767	P-3	J-3	J-4	65.00	300	120.00	63.45	0.9	0.221	3.209	PVC
768	P-83	J-78	J-79	214.00	250	120.00	-3.47	0.07	0.008	0.036	PVC
769	P-14	J-14	J-15	120.00	300	110.00	-3.93	0.06	0.002	0.022	Asbestos Cement
770	P-58	J-54	J-55	167.00	300	110.00	-29.25	0.41	0.15	0.899	Asbestos Cement
771	P-55	J-51	J-52	57.00	300	110.00	-28.89	0.41	0.045	0.878	Asbestos Cement
772	P-167	J-157	J-158	22.00	250	120.00	-6.87	0.14	0.002	0.13	PVC
773	P-137	J-130	J-131	98.00	200	120.00	-2.02	0.06	0.004	0.039	PVC
774	P-105	J-101	J-102	98.00	200	120.00	0.24	0.01	0	0.001	PVC
775	P-101	J-97	J-98	173.00	200	120.00	1.09	0.03	0.002	0.012	PVC
776	P-188	J-178	J-179	247.00	350	120.00	3.29	0.03	0.002	0.006	PVC
777	P-228	J-217	J-66	67.00	300	120.00	85.95	1.22	0.354	5.631	PVC
778	P-38	J-36	J-37	94.00	300	110.00	-17.53	0.25	0.033	0.349	Asbestos Cement
779	P-41	J-39	J-40	154.00	300	110.00	-17.65	0.25	0.056	0.352	Asbestos Cement
780	P-154	J-145	J-146	133.00	200	120.00	-2.89	0.09	0.01	0.076	PVC
781	P-63	J-59	J-60	123.00	300	110.00	25.44	0.36	0.082	0.694	Asbestos Cement
782	P-164	J-149	J-156	36.00	200	120.00	0.39	0.01	0	0.002	PVC
784	P-287	J-257	J-255	556.00	200	120.00	-0.86	0.03	0.004	0.008	HDPE
785	P-59	J-55	J-56 (Dummy)	74.00	300	110.00	-2.00	0.03	0	0.006	Asbestos Cement
786	P-243	J-231	J-73	144.00	200	120.00	0.11	0	0	0	PVC
787	P-264	J-242	PMP-102	2.00	600	120.00	0.00	0	0	0	PVC
788	P-7	J-7	J-8	371.00	300	120.00	29.97	0.42	0.293	0.8	PVC
789	P-268	R-1	J-239	2.00	600	120.00	0.00	0	0	0	PVC
790	P-88	J-83	J-84	56.00	200	120.00	-1.85	0.06	0.003	0.033	PVC
791	P-121	J-116	J-117	92.00	200	120.00	-0.14	0	0	0	PVC
792	P-79	J-74	J-75	142.00	200	120.00	-4.82	0.15	0.028	0.195	PVC
793	P-24	J-23	J-24	158.00	300	110.00	2.28	0.03	0.001	0.008	Asbestos Cement
794	P-47	J-45	J-46	103.00	300	110.00	7.11	0.1	0.006	0.065	Asbestos Cement
795	P-31	J-29	J-30	83.00	300	110.00	5.58	0.08	0.003	0.042	Asbestos Cement
796	P-196	J-186	J-187	92.00	300	120.00	1.37	0.02	0	0.003	PVC
797	P-107	J-94	J-104	107.00	200	120.00	-0.81	0.03	0.001	0.008	PVC
799	P-161	J-152	J-153	68.00	200	120.00	0.44	0.01	0	0.002	PVC
800	P-250	J-234	J-235	2.00	400	120.00	0.00	0	0	0	PVC
801	P-136	J-129	J-130	187.00	200	120.00	-1.90	0.06	0.006	0.035	PVC
802	P-27	J-26	J-16	95.00	300	110.00	4.65	0.07	0.003	0.03	Asbestos Cement
803	P-173	J-163	J-164	99.00	300	120.00	-9.02	0.13	0.009	0.087	PVC
804	P-66	J-61	J-62	112.00	300	110.00	-27.73	0.39	0.091	0.814	Asbestos Cement
805	P-284	J-68	J-255	311.00	200	120.00	3.88	0.12	0.043	0.131	HDPE
806	P-257	PMP-102	J-235	2.00	150	120.00	0.00	0	0	0	PVC
807	P-218	J-207	J-208	408.00	300	120.00	17.79	0.25	0.132	0.305	PVC
808	P-239	J-227	J-228	96.00	300	120.00	-1.82	0.03	0.001	0.004	PVC
809	P-18	J-18	J-8	31.00	300	110.00	-6.44	0.09	0.002	0.055	Asbestos Cement
811	P-130	J-123	J-124	65.00	200	120.00	-0.82	0.03	0.001	0.008	PVC
812	P-143	J-136	J-126	89.00	200	120.00	1.67	0.05	0.002	0.027	PVC
813	P-93	J-88	J-89	68.00	200	120.00	-3.56	0.11	0.007	0.112	PVC
814	P-207	J-197	J-198	121.00	300	120.00	2.77	0.04	0.001	0.01	PVC
815	P-149	J-141	J-142	40.00	150	120.00	0.00	0	0	0	PVC
816	P-259	J-239	J-240	2.00	600	120.00	0.00	0	0	0	PVC
817	P-34	J-32	J-33	60.00	300	110.00	13.26	0.19	0.014	0.208	Asbestos Cement
818	P-85	J-80 (Dummy)	J-81	125.00	250	120.00	-2.56	0.05	0.003	0.02	PVC
819	P-256	PMP-103	J-236	2.00	200	120.00	0.00	0	0	0	PVC
820	P-183	J-174	J-175	119.00	200	120.00	0.94	0.03	0.001	0.009	PVC
821	P-266	J-240	PMP-104	2.00	600	120.00	0.00	0	0	0	PVC
822	P-111	J-107	J-108	99.00	200	120.00	-0.08	0	0	0	PVC
823	P-308(2)	J-470	J-469	207.00	300	120.00	-9.07	0.13	0.018	0.088	PVC
824	P-233	J-221	J-222	79.00	300	120.00	-10.66	0.15	0.009	0.118	PVC
825	P-175	J-165	J-166	352.00	300	120.00	-35.16	0.5	0.319	1.076	PVC
826	P-53	J-50	J-31	149.00	300	110.00	8.29	0.12	0.013	0.087	Asbestos Cement
827	P-96	J-86	J-92	190.00	200	120.00	0.08	0	0	0	PVC
828	P-191	J-181	J-182	234.00	350	120.00	3.16	0.03	0.001	0.006	PVC
831	P-145	J-138	J-128	73.00	150	120.00	0.00	0	0	0	PVC
832	P-273	J-218	J-246	35.00	300	120.00	-85.95	1.22	0.168	5.63	PVC
833	P-185	J-177	J-170	76.00	200	120.00	2.39	0.08	0.004	0.053	PVC
834	P-213	J-201	J-203	142.00	300	120.00	-11.56	0.16	0.02	0.137	PVC
835	P-114	J-110	J-111	107.00	200	120.00	0.21	0.01	0	0.001	PVC
836	P-178	J-168	J-169	64.00	300	120.00	-24.60	0.35	0.071	0.555	PVC
837	P-151	J-143	J-144	26.00	150	120.00	0.00	0	0	0	PVC
838	P-67	J-62	J-63	99.00	300	110.00	-27.73	0.39	0.08	0.815	Asbestos Cement
839	P-310(2)	J-468 (Dummy)	J-467	69.00	300	120.00	-17.26	0.24	0.022	0.288	PVC
840	P-42	J-40	J-41	91.00	300	110.00	16.47	0.23	0.029	0.31	Asbestos Cement

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
841	P-123	J-109	J-119	21.00	200	120.00	0.85	0.03	0	0.011	PVC
842	P-12	J-12	J-13	89.00	300	120.00	31.79	0.45	0.084	0.893	PVC
843	P-127	J-120	J-121	205.00	200	120.00	-1.49	0.05	0.005	0.022	PVC
844	P-39	J-37	J-38	110.00	300	110.00	-17.53	0.25	0.038	0.348	Asbestos Cement
845	P-198	J-76	J-189	340.00	250	120.00	0.39	0.01	0	0	PVC
846	P-21	J-20	J-21	62.00	300	110.00	9.06	0.13	0.006	0.102	Asbestos Cement
847	P-252	J-236	J-237	2.00	400	120.00	0.00	0	0	0	PVC
848	P-81	J-76	J-77	87.00	250	120.00	-3.47	0.07	0.003	0.036	PVC
849	P-293	J-264	J-261	179.00	300	120.00	-17.38	0.25	0.048	0.292	PVC
850	P-236	J-224	J-225	82.00	300	120.00	0.00	0	0	0	PVC
851	P-69	Acheson Zone 3	J-65	123.00	300	110.00	-29.17	0.41	0.11	0.894	Asbestos Cement
852	P-65	J-55	J-61	151.00	300	110.00	-27.61	0.39	0.122	0.808	Asbestos Cement
853	P-4	J-4	J-5	124.00	300	120.00	63.45	0.9	0.397	3.209	PVC
854	P-168	J-158	J-159	265.00	300	120.00	-6.87	0.1	0.014	0.052	PVC
855	P-56	J-52	J-53	70.00	300	110.00	-28.89	0.41	0.066	0.878	Asbestos Cement
856	P-139	J-132	J-133	106.00	200	120.00	0.62	0.02	0	0.004	PVC
857	P-36	J-34	J-35	61.00	300	110.00	13.26	0.19	0.014	0.208	Asbestos Cement
858	P-103	J-99	J-100	157.00	200	120.00	0.62	0.02	0.001	0.004	PVC
859	P-98	J-94	J-95	59.00	200	120.00	1.50	0.05	0.001	0.022	PVC
860	P-116	Lakeshore	J-113	107.00	200	120.00	-0.30	0.01	0	0.001	PVC
861	P-305(2)	J-262	J-472	275.00	300	120.00	-3.05	0.04	0.003	0.012	PVC
863	P-165	J-156	J-152	29.00	200	120.00	0.39	0.01	0	0	PVC
864	P-221	J-210	J-211	208.00	300	120.00	-40.36	0.57	0.289	1.388	PVC
865	P-60	J-56 (Dummy)	J-57	133.00	300	110.00	-10.18	0.14	0.017	0.127	Asbestos Cement
866	P-244	J-135	J-232	151.00	200	120.00	-1.68	0.05	0.004	0.028	PVC
867	P-106	J-102	J-103	82.00	200	120.00	0.13	0	0	0	PVC
868	P-269	J-35	J-244	73.00	350	120.00	58.96	0.61	0.032	1.323	PVC
869	P-89	J-84	J-85	64.00	200	120.00	-1.89	0.06	0.002	0.034	PVC
870	P-25	J-24	J-25 (Dummy)	124.00	300	110.00	2.28	0.03	0.001	0.008	Asbestos Cement
871	P-23	J-22	J-23	47.00	300	110.00	2.40	0.03	0	0.008	Asbestos Cement
872	P-37	J-35	J-36	106.00	300	110.00	-17.53	0.25	0.037	0.348	Asbestos Cement
873	P-43	J-41	J-42	45.00	300	110.00	16.35	0.23	0.015	0.307	Asbestos Cement
874	P-19	J-18	J-19	89.00	300	110.00	9.18	0.13	0.009	0.105	Asbestos Cement
876	P-77	J-70	J-73	144.00	200	120.00	-4.68	0.15	0.027	0.185	PVC
877	P-94	J-89	J-90	141.00	200	120.00	-3.65	0.12	0.017	0.116	PVC
878	P-260	J-240	J-241	2.00	600	120.00	0.00	0	0	0	PVC
879	P-267	J-239	PMP-105	2.00	600	120.00	0.00	0	0	0	PVC
880	P-297	J-243	OLD FIRE PUMP	4.00	500	120.00	0.00	0	0	0	PVC
881	P-253	J-237	J-238	2.00	400	120.00	0.00	0	0	0	PVC
882	P-186	J-176	J-177	48.00	200	120.00	1.53	0.05	0.001	0.023	PVC
883	P-86	J-81	J-82	220.00	200	120.00	0.81	0.03	0.002	0.007	PVC
884	P-274	J-246	J-247	370.00	300	120.00	40.36	0.57	0.51	1.388	PVC
885	P-214	J-203	J-204	29.00	300	120.00	-12.41	0.18	0.005	0.155	PVC
886	P-311(2)	J-467	J-466	82.00	300	120.00	-18.70	0.26	0.027	0.334	PVC
887	P-194	J-184	J-185	66.00	300	120.00	2.81	0.04	0.001	0.01	PVC
888	P-40	J-38	J-39	44.00	300	110.00	-17.65	0.25	0.015	0.352	Asbestos Cement
889	P-199	J-189	J-190	318.00	300	120.00	-13.43	0.19	0.059	0.181	PVC
890	P-162	J-153	J-154	39.00	200	120.00	0.40	0.01	0	0.002	PVC
891	P-82	J-77	J-78	43.00	250	120.00	-3.47	0.07	0.002	0.036	PVC
892	P-54	J-35	J-51	62.00	300	110.00	-28.17	0.4	0.052	0.838	Asbestos Cement
893	P-57	J-53	J-54	91.00	300	110.00	-29.25	0.41	0.081	0.899	Asbestos Cement
894	P-99	J-95	J-96	66.00	200	120.00	1.46	0.05	0.001	0.021	PVC
895	P-166	J-147	J-157	23.00	200	120.00	-6.83	0.22	0.009	0.372	PVC
896	P-222	J-211	J-212	47.00	300	120.00	0.00	0	0	0	PVC
897	P-245	J-133	J-233	76.00	200	120.00	0.17	0.01	0	0.001	PVC
898	P-1	J-1	J-2	158.00	300	120.00	65.85	0.93	0.582	3.439	PVC
899	P-90	J-85	J-86	140.00	200	120.00	-3.18	0.1	0.012	0.091	PVC
900	P-13	J-13	J-14	30.00	300	110.00	28.93	0.41	0.046	0.881	Asbestos Cement
901	P-48	J-46	J-47	139.00	300	110.00	7.11	0.1	0.009	0.066	Asbestos Cement
903	P-155	J-146	J-147	23.00	200	120.00	-2.89	0.09	0.002	0.075	PVC
904	P-302(2)	J-259	J-461	628.00	300	120.00	31.41	0.44	0.296	0.873	PVC
905	P-240	J-208	J-230	357.00	300	120.00	-0.15	0	0	0	PVC
906	P-187	J-168	J-178	363.00	350	120.00	4.01	0.04	0.003	0.009	PVC
907	P-262	J-242	J-243	2.00	600	120.00	0.00	0	0	0	PVC
908	P-275	J-247	J-248	75.00	300	120.00	40.36	0.57	0.105	1.389	PVC
909	P-312(2)	J-466	J-465	94.00	300	120.00	-18.70	0.26	0.031	0.334	PVC
910	P-153	J-145	J-132	114.00	200	120.00	0.70	0.02	0.001	0.005	PVC
911	P-62	J-58	J-59	127.00	300	110.00	32.78	0.46	0.142	1.11	Asbestos Cement
912	P-163	J-154	J-155	61.00	200	120.00	0.27	0.01	0	0.001	PVC
913	P-208	J-198	J-199	68.00	300	120.00	0.12	0	0	0	PVC
914	P-100	J-96	J-97	141.00	200	120.00	1.12	0.04	0.002	0.013	PVC
915	P-91	J-86	J-87	166.00	200	120.00	-3.35	0.11	0.017	0.1	PVC
916	P-49	J-47	J-26	98.00	300	110.00	6.99	0.1	0.006	0.063	Asbestos Cement
917	P-314(2)	J-464	J-230	207.00	300	120.00	0.27	0	0	0	PVC
918	P-242	J-229	J-230	45.00	250	120.00	-0.12	0	0	0	PVC
919	P-6	J-7	J-6	24.00	200	120.00	0.12	0	0	0	PVC
920	P-263	J-243	PMP-101	2.00	600	120.00	0.00	0	0	0	PVC
921	P-2	J-2	J-3	142.00	300	120.00	64.53	0.91	0.455	3.311	PVC
922	P-180	J-171	J-172	67.00	200	120.00	2.56	0.08	0.004	0.061	PVC
923	P-50	J-44	J-48	97.00	300	110.00	8.77	0.12	0.01	0.097	Asbestos Cement
924	P-169	J-159	J-160	124.00	300	120.00	-6.87	0.1	0.007	0.053	PVC
925	P-315(2)	J-465	J-464	45.00	300	120.00	-18.70	0.26	0.015	0.335	PVC
926	P-87	J-82	J-83	149.00	200	120.00	-1.73	0.06	0.003	0.029	PVC
927	P-51	J-48	J-49	123.00	300	110.00	8.77	0.12	0.012	0.096	Asbestos Cement
928	P-170	J-160	J-161	104.00	300	120.00	-6.33	0.09	0.005	0.045	PVC
929	P-179	J-163	J-171	113.00	200	120.00	2.69	0.09	0.007	0.066	PVC
930	P-113	J-231	J-125	185.00	200	120.00	-0.11	0	0	0	PVC
931	P-203	J-125	J-209	180.00	200	120.00	0.13	0	0	0	PVC
932	P-204	J-125	J-214	107.00	200	120.00	0.00	0	0	0	PVC
933	P-205	J-193	J-215	201.00	300	120.00	12.87	0.18	0.034	0.167	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
934	P-219	J-26	J-216	167.00	200	110.00	-3.68	0.12	0.023	0.14	Asbestos Cement
935	P-303	J-193	J-274	39.00	300	120.00	-13.53	0.19	0.006	0.183	PVC
936	P-305	J-274	J-194	198.00	200	120.00	0.13	0	0	0	PVC
937	P-306	J-189	J-274	249.00	300	120.00	13.65	0.19	0.047	0.187	PVC
938	P-307	J-228	J-275	314.00	300	120.00	-2.43	0.03	0.001	0.007	PVC
940	P-310	J-188	J-276	110.00	300	120.00	1.13	0.02	0	0.001	PVC
941	P-311	J-276	J-182	265.00	300	120.00	-2.70	0.04	0.002	0.009	PVC
942	P-312	J-276	J-277	170.00	300	120.00	3.71	0.05	0.003	0.017	PVC
944	P-314	J-278	J-279 (Dummy)	172.00	300	120.00	-86.85	1.23	1.018	5.74	PVC
945	P-315	J-279 (Dummy)	J-280	255.00	300	120.00	-95.03	1.34	1.548	6.782	PVC
946	P-413	J-369	J-9	217.00	300	120.00	-19.63	0.28	0.064	0.365	PVC
947	P-463	J-119	J-413	36.00	150	120.00	0.47	0.03	0	0.01	PVC
948	P-464	J-413	J-118	118.00	200	120.00	0.47	0.02	0	0.003	PVC
949	P-466	J-414	J-263	264.00	300	120.00	13.39	0.19	0.037	0.18	PVC
950	P-467	J-8	J-415	209.00	300	120.00	23.17	0.33	0.103	0.497	PVC
952	P-469	J-262	J-416	50.00	300	120.00	13.51	0.19	0.014	0.183	PVC
953	P-470	J-416	J-414	71.00	300	120.00	13.51	0.19	0.014	0.183	PVC
954	P-471	J-244	J-417	188.00	600	120.00	58.96	0.21	0.034	0.096	HDPE
955	P-472	J-417	J-418	70.00	600	120.00	61.45	0.22	0.007	0.104	PVC
956	P-483	J-216	J-426	467.00	200	110.00	-3.68	0.12	0.066	0.139	Asbestos Cement
957	P-485	J-427	J-66	310.00	200	110.00	-13.69	0.44	0.483	1.588	Asbestos Cement
961	P-494	J-238	PRV-4	3.00	350	120.00	0.00	0	0	0	PVC
962	P-495	PRV-4	J-244	3.00	350	120.00	0.00	0	0	0	PVC
963	P-496	PRV-5	J-280	37.00	400	120.00	410.17	3.26	3.078	25.059	PVC
965	P-500	J-433	J-427	244.00	200	110.00	-12.49	0.4	0.327	1.339	Asbestos Cement
966	P-501	J-40	J-433	147.00	300	110.00	-8.68	0.12	0.013	0.095	Asbestos Cement
967	P-502	J-225	J-317	106.00	300	120.00	0.00	0	0	0	PVC
968	P-529	J-461	J-542	318.00	300	120.00	31.05	0.44	0.108	0.854	PVC
971	P-536	J-202	J-183	115.00	350	120.00	-6.14	0.06	0.004	0.02	PVC
972	P-597	J-232	J-455	163.00	200	120.00	-0.25	0.01	0	0.001	PVC
973	P-598	J-137	J-456	53.00	200	120.00	-0.98	0.03	0.001	0.01	PVC
974	P-599	J-456	J-457	147.00	200	120.00	0.85	0.03	0.001	0.008	PVC
975	P-600	J-457	J-458	105.00	200	120.00	0.04	0	0	0	PVC
976	P-601	J-458	J-459	75.00	200	120.00	0.00	0	0	0	PVC
977	P-602	J-457	J-460	112.00	200	120.00	-0.34	0.01	0	0.001	PVC
978	P-603	J-457	J-462	99.00	200	120.00	1.06	0.03	0.001	0.012	PVC
979	P-604	J-462	J-473	83.00	200	120.00	1.02	0.03	0.001	0.011	PVC
982	P-607	J-263	J-261	199.00	300	120.00	10.50	0.15	0.025	0.114	PVC
983	P-608	J-263	J-474	104.00	300	120.00	2.89	0.04	0.001	0.01	PVC
984	P-609	J-155	J-475	48.00	200	120.00	0.19	0.01	0	0	PVC
985	P-610	J-475	J-476	99.00	200	120.00	0.19	0.01	0	0	PVC
986	P-611	J-476	J-477	118.00	200	120.00	0.19	0.01	0	0.001	PVC
987	P-612	J-477	J-478	106.00	200	120.00	0.02	0	0	0	PVC
988	P-613	J-478	J-479	100.00	200	120.00	-0.04	0	0	0	PVC
989	P-614	J-479	J-480	106.00	200	120.00	-1.50	0.05	0.002	0.022	PVC
990	P-615	J-478	Country Squire	134.00	200	120.00	0.01	0	0	0	PVC
991	P-616	Country Squire	J-482	51.00	200	120.00	0.00	0	0	0	PVC
992	P-617	J-483	J-88	77.00	200	120.00	0.00	0	0	0	PVC
993	P-618	J-255	J-484	74.00	300	120.00	-4.82	0.07	0.004	0.027	PVC
994	P-619	J-484	J-485	90.00	300	120.00	-4.89	0.07	0.003	0.028	PVC
995	P-620	J-485	Greenbriar	149.00	300	120.00	-4.93	0.07	0.003	0.028	PVC
996	P-621	Greenbriar	J-487	95.00	300	120.00	-5.10	0.07	0.004	0.03	PVC
997	P-622	J-487	J-488	146.00	300	120.00	-5.14	0.07	0.003	0.031	PVC
998	P-623	J-488	J-489	137.00	300	120.00	-5.14	0.07	0.005	0.031	PVC
999	P-624	J-489	J-490	161.00	300	120.00	5.47	0.08	0.004	0.034	PVC
1000	P-625	J-490	J-491	59.00	300	120.00	5.00	0.07	0.003	0.029	PVC
1001	P-626	J-472	J-492	200.00	300	120.00	6.03	0.09	0.008	0.041	PVC
1003	P-628	J-493	J-494	221.00	300	120.00	8.20	0.12	0.019	0.073	PVC
1004	P-631	J-496	J-701	290.00	300	120.00	8.20	0.12	0.01	0.072	PVC
1006	P-633	J-494	J-496	395.00	300	120.00	8.20	0.12	0.013	0.073	PVC
1007	P-634	J-256	J-499	159.00	200	120.00	0.13	0	0	0	HDPE
1008	P-635	J-125	J-500	208.00	200	120.00	-0.41	0.01	0	0.002	PVC
1009	P-636	J-500	J-193	123.00	200	120.00	-0.53	0.02	0	0.004	PVC
1012	P-639	J-75	J-502	104.00	200	120.00	-1.99	0.06	0.004	0.039	PVC
1013	P-640	J-502	J-503	95.00	200	120.00	-2.08	0.07	0.004	0.041	PVC
1014	P-641	J-503	J-504	118.00	200	120.00	-2.20	0.07	0.005	0.046	PVC
1015	P-642	J-504	J-505	103.00	200	120.00	-2.33	0.07	0.005	0.051	PVC
1016	P-643	J-75	J-506	84.00	200	120.00	0.25	0.01	0	0	PVC
1017	P-644	J-506	J-507	147.00	200	120.00	0.13	0	0	0.001	PVC
1018	P-533	J-426	J-433	198.00	200	110.00	-3.68	0.12	0.028	0.14	Asbestos Cement
1021	P-439	J-513	J-167	152.00	300	120.00	-35.16	0.5	0.131	1.076	HDPE
1023	P-441	J-148	J-338	252.00	200	120.00	0.83	0.03	0.002	0.008	PVC
1024	P-443	J-339	J-232	126.00	200	120.00	1.43	0.05	0.003	0.02	PVC
1025	P-445	J-340	J-341	74.00	200	120.00	0.08	0	0	0	PVC
1026	P-446	J-338	J-342	79.00	200	120.00	0.76	0.02	0.001	0.007	PVC
1027	P-447	J-342	J-340	138.00	200	120.00	0.13	0	0	0	PVC
1028	P-448	J-342	J-343	127.00	200	120.00	0.63	0.02	0.001	0.004	PVC
1029	P-449	J-343	J-344	109.00	200	120.00	0.08	0	0	0.001	PVC
1030	P-450	J-344	J-345	88.00	200	120.00	0.08	0	0	0	PVC
1031	P-451	J-345	J-346	107.00	200	120.00	-1.20	0.04	0.001	0.015	PVC
1032	P-452	J-255	J-347	531.00	300	120.00	7.75	0.11	0.029	0.065	HDPE
1034	P-454	J-347	J-348	255.00	200	120.00	1.36	0.04	0.004	0.019	PVC
1036	P-456	J-349	J-350	241.00	250	120.00	0.86	0.02	0.001	0.003	PVC
1037	P-457	J-350	J-351	254.00	250	120.00	-3.81	0.08	0.01	0.043	PVC
1038	P-458	J-351	J-352	307.00	250	120.00	-5.00	0.1	0.018	0.07	PVC
1039	P-459	J-352	J-353	190.00	250	120.00	-5.00	0.1	0.01	0.07	PVC
1040	P-460	J-353	J-491	195.00	250	120.00	-5.00	0.1	0.014	0.07	PVC
1042	P-462	J-354	J-355	173.00	300	120.00	29.98	0.42	0.138	0.8	PVC
1043	P-465	J-355	J-356	310.00	300	120.00	21.23	0.3	0.131	0.422	PVC
1044	P-473	J-356	J-357	485.00	300	120.00	21.23	0.3	0.205	0.422	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1045	P-474	J-357	J-358	563.00	300	120.00	21.23	0.3	0.187	0.422	PVC
1048	P-477	J-621	J-361	826.00	300	120.00	44.44	0.63	1.187	1.66	PVC
1049	P-479	J-362	J-363	800.00	300	120.00	18.90	0.27	0.254	0.341	PVC
1052	P-486	J-252	J-367	354.00	300	120.00	7.55	0.11	0.014	0.062	PVC
1053	P-487	J-367	J-368	382.00	300	120.00	4.93	0.07	0.016	0.028	PVC
1054	P-488	J-368	J-370	1,171.00	300	120.00	1.72	0.02	0.005	0.004	PVC
1057	P-499	J-511	J-372	586.00	250	120.00	-8.95	0.18	0.035	0.207	PVC
1058	P-504	J-176	J-373	101.00	200	120.00	-2.07	0.07	0.004	0.041	PVC
1059	P-505	J-373	J-374	144.00	200	120.00	-2.07	0.07	0.006	0.041	PVC
1060	P-506	J-374	J-375	147.00	200	120.00	-2.31	0.07	0.007	0.05	PVC
1061	P-507	J-375	J-164	158.00	200	120.00	-2.31	0.07	0.008	0.05	PVC
1062	P-508	J-165	J-376	357.00	200	120.00	13.29	0.42	0.432	1.278	PVC
1063	P-510	J-377	J-378	401.00	200	120.00	4.94	0.16	0.086	0.205	PVC
1064	P-512	J-379	J-380	394.00	200	120.00	0.39	0.01	0.001	0.002	PVC
1065	P-513	J-380	J-460	90.00	300	120.00	0.39	0.01	0	0	PVC
1066	P-514	J-91	J-381	67.00	200	120.00	-3.86	0.12	0.008	0.129	PVC
1067	P-515	J-381	J-382	353.00	200	120.00	-3.86	0.12	0.045	0.129	PVC
1069	P-517	J-473	J-104	80.00	200	120.00	1.02	0.03	0.001	0.011	PVC
1071	P-522	J-359	J-365	1,367.00	300	120.00	35.99	0.51	1.362	1.123	PVC
1073	P-524	J-384	J-385	986.00	350	120.00	-24.15	0.25	0.194	0.253	PVC
1075	P-527	J-387	J-280	912.00	350	120.00	-159.47	1.66	7.563	8.349	PVC
1077	P-530	J-389	J-669	661.00	250	120.00	-6.65	0.14	0.052	0.119	PVC
1082	P-542	J-679	J-394	859.00	350	120.00	10.07	0.1	0.024	0.05	PVC
1084	P-544	J-396	J-397	819.00	300	120.00	-1.37	0.02	0.002	0.003	PVC
1085	P-545	J-397	J-398	906.00	300	120.00	-14.83	0.21	0.177	0.218	PVC
1087	P-548	J-400	Supreme Steel	629.00	300	120.00	-38.00	0.54	0.565	1.242	PVC
1091	P-556	J-406	J-407	798.00	300	120.00	1.28	0.02	0.002	0.002	PVC
1092	P-557	J-407	J-408	847.00	300	120.00	-7.31	0.1	0.055	0.059	PVC
1093	P-558	J-408	J-409	883.00	300	120.00	-5.87	0.08	0.033	0.039	PVC
1095	P-560	J-410	J-411	839.00	300	120.00	-14.23	0.2	0.154	0.201	PVC
1097	P-567	J-421	J-626	809.00	300	120.00	-17.46	0.25	0.233	0.294	PVC
1099	P-569	J-420	J-716	756.00	300	120.00	3.69	0.05	0.007	0.017	PVC
1103	P-573	J-424	J-425	398.00	300	120.00	48.64	0.69	0.504	1.962	PVC
1107	P-577	J-206	J-224	304.00	322	120.00	10.04	0.12	0.024	0.075	HDPE
1108	P-580	J-173	J-429	273.00	200	120.00	1.07	0.03	0.003	0.012	PVC
1109	P-581	J-429	J-160	203.00	200	120.00	0.54	0.02	0.001	0.003	PVC
1110	P-582	J-153	J-430	277.00	200	120.00	-0.09	0	0	0	PVC
1111	P-583	J-430	J-480	334.00	200	120.00	-0.76	0.02	0.002	0.007	PVC
1112	P-584	J-480	J-431	297.00	200	120.00	-2.34	0.07	0.02	0.052	PVC
1113	P-585	J-431	J-170	268.00	200	120.00	-2.39	0.08	0.01	0.053	PVC
1116	P-588	J-435	J-436	431.00	200	120.00	0.30	0.01	0	0.001	PVC
1117	P-589	J-436	J-455	232.00	200	120.00	0.30	0.01	0	0.001	PVC
1118	P-590	J-340	J-437	148.00	200	120.00	-0.37	0.01	0	0.002	PVC
1119	P-591	J-437	J-339	102.00	200	120.00	1.60	0.05	0.003	0.025	PVC
1120	P-593	J-438	J-147	134.00	300	120.00	-2.29	0.03	0.001	0.007	PVC
1124	P-630	J-505	J-82	489.00	200	120.00	-2.50	0.08	0.028	0.058	PVC
1127	P-647	J-622	J-406	1,537.00	300	120.00	14.75	0.21	0.188	0.215	PVC
1130	P-652	J-365	J-440	499.00	300	120.00	-7.20	0.1	0.011	0.057	PVC
1131	P-653	J-361	J-441	378.00	300	120.00	39.09	0.55	0.948	1.309	PVC
1132	P-654	J-441	J-362	813.00	300	120.00	23.97	0.34	0.43	0.529	PVC
1133	P-655	J-440	J-441	555.00	300	120.00	-7.20	0.1	0.032	0.057	PVC
1134	P-661	PRV-14	J-621	37.00	300	120.00	86.81	1.23	0.325	5.736	PVC
1137	P-664	J-385	PRV-16	32.00	350	120.00	-44.58	0.46	0.179	0.788	PVC
1138	P-665	PRV-16	J-386	969.00	350	120.00	-44.59	0.46	0.673	0.788	PVC
1140	P-671	J-379	J-93	481.00	200	120.00	0.90	0.03	0.004	0.009	PVC
1141	P-676	J-367	J-442	771.00	300	120.00	2.36	0.03	0.003	0.007	PVC
1143	P-678	J-511	J-510	93.00	250	120.00	4.48	0.09	0.02	0.058	PVC
1149	P-684	J-509	J-444	384.00	300	120.00	-14.26	0.2	0.09	0.202	PVC
1150	P-685	J-444	J-403	378.00	300	120.00	27.16	0.38	0.33	0.667	PVC
1153	P-688	J-401	J-623	837	300	120	-11.15	0.16	0.09	0.128	PVC
1155	P-690	J-423	J-407	831	300	120	4.9	0.07	0.023	0.028	PVC
1157	P-692	J-365	J-363	807	300	120	29.81	0.42	0.641	0.792	PVC
1158	P-693	J-169	J-388	745	300	120	-17.58	0.25	0.144	0.298	PVC
1159	P-694	J-370	J-445	752	300	120	-1.76	0.02	0.003	0.004	PVC
1169	P-705	J-449	J-208	166	300	120	-17.82	0.25	0.042	0.305	PVC
1171	P-707	Supreme Steel	J-450	178	410	120	-120.83	0.92	0.497	2.31	HDPE
1172	P-708	J-450	J-1	334	400	120	-120.83	0.96	0.875	2.606	PVC
1174	P-710	J-343	J-452	68	200	120	0.29	0.01	0	0.001	PVC
1175	P-711	J-437	J-453	67	200	120	-1.97	0.06	0.003	0.038	PVC
1176	P-712	J-453	J-438	139	300	120	-2.22	0.03	0.001	0.006	PVC
1180	P-717	J-399	J-463	398	300	120	-49.74	0.7	0.814	2.044	PVC
1181	P-718	J-463	J-400	489	300	120	-40.91	0.58	0.859	1.423	PVC
1185	P-722	J-607	J-463	437	300	120	14.39	0.2	0.089	0.206	PVC
1186	P-723	J-418	J-495	222	600	120	61.45	0.22	0.031	0.103	PVC
1190	P-727	J-514	J-417	673	300	120	2.49	0.04	0.003	0.008	PVC
1191	P-728	J-402	J-509	260	300	120	35.82	0.51	0.723	1.113	PVC
1192	P-729	J-509	J-412	472	400	120	42.67	0.34	0.091	0.379	PVC
1193	P-730	R-4	PRV-18	2	300	120	361.7	5.12	0.161	80.59	PVC
1194	P-731	PRV-18	J-454	2	300	120	361.52	5.11	0.161	80.553	PVC
1203	P-735	J-449	J-515	810	250	120	4.84	0.1	0.022	0.067	PVC
1206	P-737	J-425	J-516	666	300	120	48.64	0.69	0.341	1.962	PVC
1211	P-740	J-424	J-518	0	300	120	0	0	0	0	PVC
1213	P-741	J-390	J-519	897	400	120	0	0	0	0	PVC
1216	P-743	J-373	J-520	0	200	120	0	0	0	0	PVC
1218	P-744	J-348	J-521	448	200	120	0.99	0.03	0.003	0.01	PVC
1219	P-745	J-521	J-349	448	200	120	0.99	0.03	0.002	0.01	PVC
1222	P-746	J-521	J-523	0	200	120	0	0	0	0	PVC
1224	P-747	J-349	J-524	0	250	120	0	0	0	0	PVC
1226	P-748	J-351	J-525	0	200	120	0	0	0	0	PVC
1248	P-754	J-495	J-529	560	600	120	30.66	0.11	0.003	0.028	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1251	P-756	J-529	J-530	0	600	120	30.66	0.11	0.003	0.029	PVC
1253	P-757	J-530	J-531	0	600	120	30.66	0.11	0.005	0.029	PVC
1255	P-758	J-531	J-532	0	600	120	30.66	0.11	0.003	0.028	PVC
1256	P-759	J-532	J-390	0	600	120	30.66	0.11	0.005	0.029	PVC
1257	P-760	J-390	J-495	0	600	120	-30.79	0.11	0.019	0.029	PVC
1262	P-762	PRV-A	J-535	185	300	120	50.64	0.72	0.149	2.114	PVC
1263	P-763	J-535	Panattoni	185	300	120	20.66	0.29	0.073	0.402	PVC
1269	P-767	J-536	J-537	0	300	120	-27.03	0.38	0.252	0.661	PVC
1273	P-769	J-537	J-539	0	300	120	4.94	0.07	0.009	0.028	PVC
1275	P-770	J-536	J-540	0	300	120	0	0	0	0	PVC
1277	P-771	J-541	J-536	0	300	120	-8.17	0.12	0.012	0.072	PVC
1280	P-773	J-542	PRV-A	0	300	120	50.64	0.72	0.209	2.114	PVC
1287	P-778	J-547	J-541	0	300	120	-8.17	0.12	0.04	0.072	PVC
1290	P-779	J-537	J-546	0	300	120	-32.21	0.46	0.307	0.915	PVC
1294	P-782	J-536	J-547	0	300	120	11.42	0.16	0.052	0.134	PVC
1295	P-783	J-547	J-542	0	350	120	19.59	0.2	0.066	0.172	PVC
1304	P-789	J-1	J-550	0	350	120	-188.85	1.96	2.492	11.418	PVC
1309	P-792	J-82	J-552	0	200	120	0.04	0	0	0	PVC
1311	P-793	J-345	J-553	288	200	120	1.08	0.03	0.001	0.012	PVC
1312	P-794	J-553	J-435	288	200	120	1.08	0.03	0.002	0.012	PVC
1314	P-795	J-197	J-554	247	300	120	-15.26	0.22	0.038	0.229	PVC
1315	P-796	J-554	J-200	247	300	120	-19.19	0.27	0.027	0.35	PVC
1316	P-797	J-261	J-554	0	200	120	-3.93	0.13	0.098	0.134	PVC
1318	P-798	J-261	J-555	401	300	120	-2.95	0.04	0.001	0.011	PVC
1319	P-799	J-555	J-196	401	300	120	-11.89	0.17	0.041	0.144	PVC
1324	P-801	J-555	J-558	0	200	120	0	0	0	0	PVC
1325	P-802	J-558	J-556	0	200	120	0	0	0	0	PVC
1326	P-803	J-557	J-558	0	200	120	0	0	0	0	PVC
1331	P-806	J-168	J-560	1,219	350	120	-11.1	0.12	0.034	0.06	PVC
1334	P-808	J-246	J-561	359	322	120	-126.31	1.55	1.491	8.137	HDPE
1335	P-809	J-561	J-278	359	300	120	-86.85	1.23	0.985	5.741	PVC
1337	P-810	J-277	J-562	362	300	120	7.8	0.11	0.015	0.066	PVC
1338	P-811	J-562	J-451	362	300	120	7.68	0.11	0.01	0.064	PVC
1340	P-812	J-451	J-563	0	300	120	6.72	0.1	0.015	0.05	PVC
1343	P-814	J-563	J-564	0	300	120	3.47	0.05	0.005	0.015	PVC
1344	P-815	J-564	J-167	0	300	120	3.47	0.05	0.003	0.015	PVC
1346	P-816	J-275	J-565	618	300	120	2.9	0.04	0.003	0.01	PVC
1347	P-817	J-565	J-180 (Dummy)	618	300	120	12.39	0.18	0.06	0.156	PVC
1349	P-818	J-275	J-566	785	300	120	-5.45	0.08	0.007	0.034	PVC
1350	P-819	J-614	J-388	785	300	120	-15.17	0.21	0.143	0.227	PVC
1352	P-820	J-566	J-567	0	300	120	0.12	0	0	0	PVC
1354	P-821	J-262	J-568	797	300	120	-10.46	0.15	0.055	0.114	PVC
1355	P-822	J-568	J-449	797	300	120	-10.46	0.15	0.044	0.114	PVC
1357	P-823	Panattoni	J-569	726	300	120	18.97	0.27	0.029	0.344	PVC
1361	P-826	J-570	J-464	726	300	120	18.97	0.27	0.077	0.343	PVC
1364	P-828	J-571	J-570	726	300	120	18.97	0.27	0.035	0.343	PVC
1368	P-830	J-573	Supreme Steel	1,001	400	120	-82.82	0.66	0.226	1.295	PVC
1374	P-834	J-575	J-369	589	300	120	-19.39	0.27	0.053	0.357	PVC
1376	P-835	J-424	J-576	899	400	120	11.18	0.09	0.008	0.032	PVC
1386	P-837	J-454	J-577	0	300	120	170.84	2.42	1.74	20.095	PVC
1388	P-838	J-569	J-578	726	300	120	18.97	0.27	0.09	0.343	PVC
1389	P-839	J-578	J-571	726	300	120	18.97	0.27	0.025	0.342	PVC
1391	P-840	J-497	J-579	41	300	120	3.34	0.05	0.002	0.014	PVC
1392	P-841	J-579	J-498	41	300	120	0	0	0	0	PVC
1396	P-842	J-579	J-582	959	300	120	3.34	0.05	0.002	0.014	PVC
1397	P-843	J-637	J-358	959	300	120	-6.97	0.1	0.022	0.054	PVC
1402	P-845	J-403	J-585	783	300	120	27.16	0.38	0.215	0.667	PVC
1403	P-846	J-585	J-622	783	300	120	16.4	0.23	0.105	0.262	PVC
1406	P-848	J-576	J-586	899	400	120	5.77	0.05	0.003	0.009	PVC
1411	P-851	J-280	J-588	1,451	400	120	153.14	1.22	1.971	4.042	PVC
1423	P-855	J-422	J-590	905	400	120	29.91	0.24	0.071	0.196	PVC
1424	P-856	J-590	J-411	905	300	120	18.09	0.26	0.077	0.314	PVC
1426	P-857	PRV-15	J-591	974	350	120	-44.81	0.47	0.267	0.795	PVC
1427	P-858	J-591	J-387	974	350	120	-52.81	0.55	0.588	1.078	PVC
1430	P-860	J-592	J-577	0	300	120	-170.84	2.42	3.583	20.096	PVC
1438	P-864	J-595	J-596	0	300	120	35.93	0.51	0.696	1.119	PVC
1443	P-867	J-596	J-598	0	300	120	23.45	0.33	0.328	0.508	PVC
1444	P-868	J-598	J-400	0	300	120	10.49	0.15	0.099	0.115	PVC
1446	P-869	J-592	J-599	0	300	120	47.6	0.67	0.589	1.885	PVC
1447	P-870	J-599	J-595	0	300	120	47.6	0.67	1.5	1.885	PVC
1450	P-871	J-371	J-601	444	300	120	-2.47	0.04	0.002	0.008	PVC
1451	P-872	J-601	J-350	444	300	120	-4.67	0.07	0.008	0.025	PVC
1453	P-873	J-347	J-602	818	300	120	5.73	0.08	0.022	0.037	HDPE
1454	P-874	J-602	J-252	818	300	120	5.73	0.08	0.011	0.037	HDPE
1460	P-878	J-489	J-604	428	300	120	-10.66	0.15	0.026	0.118	PVC
1461	P-879	J-604	J-215	428	300	120	-12.87	0.18	0.035	0.167	PVC
1463	P-880	J-190	J-605	0	300	120	5.55	0.08	0.019	0.035	PVC
1467	P-882	J-561	J-606	0	300	120	-39.46	0.56	0.627	1.332	PVC
1468	P-883	J-606	J-588	0	300	120	-46.91	0.66	0.954	1.835	PVC
1474	P-884	J-481	J-607	0	300	120	14.39	0.2	0.076	0.206	PVC
1476	P-885	J-508	J-608	503	300	120	-64.09	0.91	0.505	3.27	PVC
1479	P-887	J-608	J-609	0	300	120	0	0	0	0	PVC
1481	P-888	J-391 (Dummy)	J-610	624	400	120	-9.73	0.08	0.01	0.025	PVC
1482	P-889	J-610	J-508	624	300	120	-18.94	0.27	0.071	0.342	PVC
1484	P-890	J-415	J-611	176	300	120	23.17	0.33	0.054	0.496	PVC
1485	P-891	J-611	J-9	176	300	120	23.17	0.33	0.01	0.495	PVC
1501	P-901	J-613	J-384	1,219	350	120	-21.15	0.22	0.074	0.198	PVC
1505	P-904	J-565	J-614	0	300	120	-9.48	0.13	0.018	0.095	PVC
1506	P-905	J-614	J-566	0	300	120	5.69	0.08	0.009	0.037	PVC
1528	P-914	J-619	J-671	1,187	350	120	-35.62	0.37	0.233	0.52	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1530	P-915	J-584	J-620	0	300	120	6.19	0.09	0.009	0.043	PVC
1531	P-916	J-620	J-585	0	300	120	6.19	0.09	0.028	0.043	PVC
1540	P-921	J-359	J-621	0	300	120	-42.37	0.6	0.816	1.519	PVC
1543	P-923	J-420	J-585	754	300	120	-16.96	0.24	0.124	0.279	PVC
1544	P-924	J-622	J-404	754	300	120	1.65	0.02	0.001	0.004	PVC
1546	P-925	J-398	J-623	789	300	120	-25.12	0.36	0.219	0.577	PVC
1547	P-926	J-623	J-399	789	300	120	-36.27	0.51	0.466	1.139	PVC
1549	P-927	J-610	J-439	356	300	120	6.93	0.1	0.03	0.053	PVC
1553	P-929	J-412	J-626	720	400	120	36.38	0.29	0.141	0.282	PVC
1554	P-930	J-626	J-422	720	400	120	29.91	0.24	0.035	0.196	PVC
1558	P-932	J-634	J-401	1,163	300	120	1.98	0.03	0.003	0.005	PVC
1560	P-933	J-508	J-629	1,206	400	120	64.21	0.51	0.352	0.808	PVC
1561	P-934	J-629	J-628	1,206	400	120	64.21	0.51	0.293	0.808	PVC
1564	P-935	J-395	J-631	803	350	120	0.29	0	0	0	PVC
1565	P-936	J-631	J-396	803	300	120	9.72	0.14	0.039	0.1	PVC
1574	P-941	J-354	J-535	0	300	120	-29.98	0.42	0.294	0.801	PVC
1580	P-944	J-439	J-624	0	300	120	1.8	0.03	0.002	0.004	PVC
1605	P-946	J-493	J-632	0	300	120	-8.75	0.12	0.007	0.082	PVC
1606	P-947	J-632	J-355	0	300	120	-8.75	0.12	0.043	0.082	PVC
1613	P-949	J-382	PRV-24	465	200	120	-8.02	0.26	0.184	0.502	PVC
1614	P-950	PRV-24	J-377	465	200	120	-8.02	0.26	0.063	0.502	PVC
1615	P-951	J-376	J-377	0	200	120	12.96	0.41	0.413	1.221	PVC
1617	P-952	J-378	PRV-25	279	200	120	3.09	0.1	0.015	0.085	PVC
1618	P-953	PRV-25	J-379	279	200	120	3.09	0.1	0.009	0.086	PVC
1620	P-954	J-628	J-634	906	400	120	64.21	0.51	0.133	0.808	PVC
1625	P-958	J-635	J-444	1,451	300	120	51.15	0.72	0.979	2.154	PVC
1626	P-959	J-402	J-635	0	300	120	-35.82	0.51	0.346	1.113	PVC
1636	P-965	J-637	J-359	594	300	120	6.97	0.1	0.016	0.054	PVC
1682	P-967	J-516	J-642	666	400	120	48.64	0.39	0.047	0.483	PVC
1683	P-968	J-642	J-393	666	400	120	48.64	0.39	0.033	0.483	PVC
1712	P-971	J-382	J-644	0	200	120	2.32	0.07	0.015	0.05	PVC
1743	P-540(2)	J-647	J-393	848	400	120	16.99	0.14	0.027	0.069	PVC
1745	P-974	J-647	J-648 (Dummy)	0	300	120	5.68	0.08	0.013	0.037	PVC
1747	P-975	J-648 (Dummy)	J-649	0	300	120	-2.5	0.04	0.001	0.008	PVC
1749	P-540(1)(1)	J-392	J-650	848	400	120	32.08	0.26	0.066	0.224	PVC
1750	P-540(1)(2)	J-650	J-647	848	400	120	22.67	0.18	0.019	0.117	PVC
1751	P-976	J-649	J-650	0	300	120	-9.41	0.13	0.031	0.094	PVC
1794	P-691(1)	J-166	J-651	105	350	120	-35.16	0.37	0.053	0.507	PVC
1795	P-691(2)	J-651	PRV-2i	1	76	120	-35.16	7.75	0.863	863.426	PVC
1797	P-438(1)	PRV-2i	J-652	1	76	120	-35.16	7.75	0.863	863.352	PVC
1798	P-438(2)	J-652	J-513	118	350	120	-35.16	0.37	0.06	0.508	PVC
1807	P-531(1)	J-207	J-653	39	300	120	-40.23	0.57	0.054	1.381	PVC
1808	P-531(2)	J-653	PRV-Bi	1	100	120	-40.23	5.12	0.291	291.108	PVC
1810	P-532(1)	PRV-Bi	J-654	1	100	120	-40.24	5.12	0.291	291.257	PVC
1811	P-532(2)	J-654	J-210	144	300	120	-40.24	0.57	0.198	1.381	PVC
1816	P-246(1)	J-190	J-655	43	300	120	-18.98	0.27	0.015	0.344	PVC
1817	P-246(2)	J-655	PRV-1i	1	76	120	-18.98	4.18	0.275	275.481	PVC
1819	P-247(1)	PRV-1i	J-656	1	76	120	-18.98	4.18	0.276	275.555	PVC
1820	P-247(2)	J-656	J-191	166	265	120	-18.98	0.34	0.104	0.628	HDPE
1825	P-605(1)	J-456	J-657	123	200	120	-1.83	0.06	0.004	0.033	PVC
1826	P-605(2)	J-657	PRV-21i	1	76	120	-1.83	0.4	0.004	3.572	PVC
1828	P-606(1)	PRV-21i	J-658	1	76	120	-1.83	0.4	0.004	3.646	PVC
1829	P-606(2)	J-658	J-140	37	200	120	-1.83	0.06	0.001	0.032	PVC
1834	P-131(1)	J-124	J-659	15	200	120	-0.82	0.03	0	0.005	PVC
1835	P-131(2)	J-659	PRV-3i	1	50	120	-0.82	0.42	0.006	6.251	PVC
1837	P-132(1)	PRV-3i	J-660	1	50	120	-0.82	0.42	0.006	6.251	PVC
1838	P-132(2)	J-660	J-126	64	200	120	-0.82	0.03	0	0.007	PVC
1858	P-989	J-83	J-662	0	200	120	0.12	0	0	0	PVC
1860	P-990	J-85	J-663	0	200	120	0.15	0	0	0	PVC
1861	P-991	J-277	J-181	0	300	120	-4.21	0.06	0.006	0.021	PVC
1883	P-854(1)	J-589	J-666	120	250	120	-10.54	0.21	0.034	0.281	PVC
1884	P-854(2)	J-666	PRV-19i	1	76.2	120	-10.54	2.31	0.092	91.604	PVC
1886	P-680(1)	PRV-19i	J-667	1	76.2	120	-10.54	2.31	0.092	91.604	PVC
1887	P-680(2)	J-667	J-165	61	300	120	-10.54	0.15	0.007	0.115	PVC
1931	P-790(1)	J-550	J-668	0	350	120	-188.85	1.96	2.367	11.418	PVC
1932	P-790(2)	J-668	J-454	0	350	120	-189.59	1.97	1.739	11.501	PVC
1934	P-662(1)	J-388	J-669	44	300	120	-32.76	0.46	0.115	0.943	PVC
1935	P-662(2)	J-669	PRV-15	44	350	120	-44.8	0.47	0.171	0.795	PVC
1937	P-995	J-169	J-670	0	250	120	-7.02	0.14	0.057	0.132	PVC
1939	P-844(1)	J-387	J-671	0	350	120	59.02	0.61	0.654	1.324	PVC
1940	P-844(2)	J-671	J-584	0	350	120	17.44	0.18	0.051	0.139	PVC
1942	P-913(1)	J-386	J-672	1,187	350	120	-33.23	0.35	0.186	0.457	PVC
1945	P-955(1)	J-634	J-673	906	350	120	28.2	0.29	0.074	0.337	PVC
1948	P-996	J-674	J-672	0	350	120	33.7	0.35	0.17	0.469	PVC
1950	P-831(1)	J-481	J-675	1,001	400	120	-80.38	0.64	0.289	1.225	PVC
1951	P-831(2)	J-675	J-574	1,001	400	120	-81.89	0.65	0.269	1.268	PVC
1953	P-886(1)	J-608	J-676	503	400	120	-64.09	0.51	0.129	0.805	PVC
1954	P-886(2)	J-676	J-481	503	400	120	-64.55	0.51	0.122	0.816	PVC
1960	P-955(2)(1)	J-673	J-681	906	350	120	27.19	0.28	0.13	0.315	PVC
1961	P-955(2)(2)	J-681	J-631	906	350	120	19.82	0.21	0.067	0.176	PVC
1962	P-997	J-678	J-677	0	300	120	-2.69	0.04	0.003	0.009	PVC
1963	P-998	J-678	J-679	0	300	120	2.69	0.04	0.001	0.009	PVC
1964	P-999	J-681	J-679	0	350	120	7.38	0.08	0.012	0.028	PVC
1966	P-490(1)	J-253	J-682	280	200	120	-1.9	0.06	0.005	0.035	PVC
1967	P-490(2)	J-682	J-371	280	200	120	-2.47	0.08	0.007	0.057	PVC
1973	P-1000	J-683	J-474	0	300	120	-2.89	0.04	0.001	0.011	PVC
1975	P-627(1)	J-492	J-685	233	300	120	5.79	0.08	0.006	0.038	PVC
1976	P-627(2)	J-685	J-493	233	300	120	2.42	0.03	0.001	0.008	PVC
1978	P-734(2)(1)	J-684	J-686	669	300	120	-1.28	0.02	0.001	0.002	PVC
1979	P-734(2)(2)	J-686	J-493	669	300	120	-2.97	0.04	0.002	0.011	PVC

ID	Label	Start Node	Stop Node	Length (m)	Diameter (mm)	Hazen-Williams C	Flow (L/s)	Velocity (m/s)	Headloss (m)	Headloss Gradient	Material
1981	P-833(1)	J-508	J-687	589	300	120	-19.06	0.27	0.08	0.346	PVC
1982	P-833(2)	J-687	J-575	589	300	120	-19.39	0.27	0.07	0.357	PVC
1984	P-725(1)	J-9	J-688	642	300	120	3.42	0.05	0.003	0.015	PVC
1985	P-725(2)	J-688	J-514	642	300	120	2.97	0.04	0.005	0.011	PVC
1987	P-849(1)	J-586	J-689	899	400	120	5.41	0.04	0.001	0.008	PVC
1988	P-849(2)	J-689	J-391 (Dummy)	899	400	120	4.21	0.03	0.001	0.005	PVC
1990	P-428(1)	J-81	J-690	1,571	250	120	-3.37	0.07	0.009	0.034	PVC
1991	P-428(2)	J-690	J-510	1,571	250	120	-4.48	0.09	0.018	0.057	PVC
1993	P-853(1)	J-372	J-691	581	250	120	-8.95	0.18	0.048	0.207	PVC
1994	P-853(2)	J-691	J-589	581	250	120	-10.54	0.21	0.056	0.281	PVC
1996	P-286(1)	J-256	J-692	219	200	120	-0.25	0.01	0	0.001	HDPE
1997	P-286(2)	J-692	J-257	219	200	120	-0.82	0.03	0.001	0.007	HDPE
1999	P-76(1)	J-71	J-693	166	200	120	0.21	0.01	0	0.001	PVC
2000	P-76(2)	J-693	J-72	166	200	120	0.13	0	0	0	PVC
2003	P-988(2)	J-694	J-200	0	200	120	1.49	0.05	0.005	0.022	PVC
2005	P-988(1)(1)	J-515	J-695	0	200	120	4.24	0.13	0.024	0.154	PVC
2006	P-988(1)(2)	J-695	J-694	0	200	120	2.74	0.09	0.013	0.069	PVC
2010	P-956(1)	J-392	J-697	0	400	120	-32.2	0.26	0.049	0.225	PVC
2011	P-956(2)	J-697	J-634	0	400	120	-34.04	0.27	0.055	0.25	PVC
2013	P-832(1)	J-574	J-698	1,001	400	120	-81.89	0.65	0.387	1.268	PVC
2014	P-832(2)	J-698	J-573	1,001	400	120	-82.22	0.65	0.088	1.277	PVC
2016	P-571(1)	J-390	J-699	201	400	120	60.37	0.48	0.152	0.721	PVC
2017	P-571(2)	J-699	J-424	201	400	120	60.18	0.48	0.117	0.717	PVC
2021	P-518(1)	J-346	J-700	347	300	120	-1.2	0.02	0	0.002	PVC
2022	P-518(2)	J-700	J-479	347	300	120	-1.45	0.02	0	0.003	PVC
2026	P-948(2)	J-701	J-497	0	300	120	5.51	0.08	0.005	0.035	PVC
2028	P-957(1)	J-588	J-702	1,451	400	120	105.02	0.84	0.263	2.01	PVC
2029	P-957(2)	J-702	J-635	1,451	300	120	99.13	1.4	4.546	7.333	PVC
2031	P-1002	J-382	J-703	0	200	120	1.84	0.06	0.007	0.033	PVC
2034	P-881(1)	J-605	J-704	0	300	120	4.29	0.06	0.005	0.022	PVC
2035	P-881(2)	J-704	J-80 (Dummy)	0	300	120	4.29	0.06	0.005	0.022	PVC
2037	P-1003	J-595	J-617	0	300	120	2.49	0.04	0.008	0.008	PVC
2042	P-734(1)(2)	J-707	J-684	669	300	120	0	0	0	0	PVC
2043	P-1004	J-631	J-705	0	300	120	9.27	0.13	0.077	0.091	PVC
2044	P-1005	J-717	J-706	0	300	120	-2.05	0.03	0.003	0.006	PVC
2046	P-960(1)	J-716	J-708	0	300	120	2.8	0.04	0.004	0.01	PVC
2047	P-960(2)	J-708	J-717	0	300	120	2.8	0.04	0.005	0.01	PVC
2049	P-900(1)	J-560	J-709	1,219	350	120	-12.55	0.13	0.012	0.076	PVC
2050	P-900(2)	J-709	J-613	1,219	350	120	-12.55	0.13	0.01	0.075	PVC
2052	P-534(1)	J-389	J-710	547	350	120	-11.24	0.12	0.018	0.061	PVC
2053	P-534(2)	J-710	J-385	547	350	120	-11.24	0.12	0.028	0.061	PVC
2055	P-1006	J-386	J-711	0	350	120	-23.8	0.25	0.085	0.247	PVC
2056	P-1007	J-670	J-389	0	250	120	-9.83	0.2	0.15	0.247	PVC
2057	P-1008	J-624	J-391 (Dummy)	0	300	120	-5.75	0.08	0.021	0.038	PVC
2058	P-1009	J-677	J-649	0	300	120	-6.91	0.1	0.011	0.053	PVC
2060	P-1011	J-546	J-360	0	300	120	-34.73	0.49	0.403	1.051	PVC
2061	P-1012	J-705	J-706	0	300	120	9.27	0.13	0.25	0.091	PVC
2063	P-1013	J-706	J-712	0	300	120	7.22	0.1	0.045	0.057	PVC
2065	P-913(2)(1)	J-672	J-713	1,187	350	120	-5.62	0.06	0.006	0.017	PVC
2066	P-913(2)(2)	J-713	J-619	1,187	350	120	-29.42	0.31	0.152	0.365	PVC
2067	P-1014	J-404	J-715	0	300	120	-11.24	0.16	0.068	0.13	PVC
2069	P-1015	J-711	J-713	0	350	120	-23.8	0.25	0.107	0.246	PVC
2072	P-1016(1)	J-584	J-715	0	300	120	11.24	0.16	0.075	0.13	PVC
2073	P-1016(2)	J-715	J-696	0	300	120	0	0	0	0	PVC
2088	P-649(1)	J-421	J-716	826	300	120	17.46	0.25	0.119	0.294	PVC
2089	P-649(2)	J-716	J-423	826	300	120	18.35	0.26	0.141	0.323	PVC
2091	P-559(1)	J-409	J-717	823	300	120	-12.32	0.17	0.067	0.154	PVC
2092	P-559(2)	J-717	J-410	823	300	120	-7.47	0.11	0.025	0.061	PVC
2094	P-1018	J-387	J-718	0	350	120	47.64	0.5	0.586	0.891	PVC
2095	P-1019	J-718	J-591	0	350	120	2.35	0.02	0.002	0.003	PVC
2096	P-1020	J-718	J-674	0	350	120	45.29	0.47	0.289	0.811	PVC
2097	P-1021	J-408	J-712	0	300	120	-7.22	0.1	0.059	0.057	PVC
2101	P-1022	J-394	J-395	0	300	120	6.06	0.09	0.032	0.041	PVC
2109	P-1023	R-5	PRV-5	0	400	120	410.48	3.27	7.159	25.094	PVC
2112	P-1024	J-364	J-445	0	300	120	15.13	0.21	0.223	0.226	PVC
2114	P-480(1)	J-363	PRV-17	806	300	120	35.32	0.5	0.522	1.085	PVC
2115	P-480(2)	PRV-17	J-364	806	300	120	35.32	0.5	0.386	1.085	PVC
2129	P-1026	J-592	J-360	0	300	120	121.54	1.72	3.658	10.696	PVC
2130	P-1027	J-360	PRV-14	0	300	120	86.81	1.23	0.261	5.736	PVC
2144	P-687(2)	J-719	J-626	807	400	120	10.99	0.09	0.01	0.031	PVC
2146	P-687(1)(1)	J-393	J-720	807	400	120	10.99	0.09	0.007	0.031	PVC
2147	P-687(1)(2)	J-720	J-719	807	400	120	10.99	0.09	0.007	0.031	PVC
2149	P-1029	J-111	J-721	0	200	120	0	0	0	0	PVC
2150	P-1030	J-168	J-167	0	350	120	18.84	0.2	0.066	0.16	PVC
2154	P-1032	J-555	J-723	0	300	120	8.93	0.13	0.011	0.085	PVC
2156	P-1033	J-723	J-724	0	300	120	8.93	0.13	0.012	0.085	PVC
2158	P-1034	J-724	J-725	0	300	120	8.93	0.13	0.022	0.085	PVC
2159	P-1035	J-725	J-192	0	300	120	8.93	0.13	0.027	0.085	PVC

AECOM

Appendix H

Water Consumption Demand Projection

Table H1: Acheson Demand Projection

Year	Growth Rate	Demand (m3/yr)	Demand (L/s)	YoY Change (%)	Reservoir Development Condition	Zone 3 ADD (m3/hr)	Zone 3 ADD L/s	Zone 4 ADD (m3/hr)	Zone 4 ADD L/s	Zone 5 ADD (m3/hr)	Zone 5 ADD L/s	Total (L/s)	Yearly Demand Increase (L/s)
2010	Actual Data	453,440	14.38	-	Pre Zone 4 Expansion (Existing)	28.9	8.03	22.9	6.4	0.0	0	14.4	-
2011		453,833	14.39	0.1		28.9	8.03	22.9	6.4	0.0	0	14.4	0
2012		435,529	13.81	-4.0		27.8	7.72	22.0	6.1	0.0	0	13.8	-0.56
2013		456,215	14.47	4.8		29.1	8.08	23.0	6.4	0.0	0	14.5	0.64
2014		510,396	16.18	11.8		32.5	9.03	25.7	7.1	0.0	0	16.2	1.7
2015		585,845	18.58	14.8		37.3	10.36	29.5	8.2	0.0	0	18.6	2.38
2016		546,679	17.34	-6.7		34.8	9.67	27.6	7.7	0.0	0	17.3	-1.21
2017		551,697	17.49	0.9		35.2	9.78	27.8	7.7	0.0	0	17.5	0.16
2018		591,440	18.75	7.2		37.7	10.47	29.8	8.3	0.0	0	18.8	1.25
2019		539,429	17.11	-8.8		34.4	9.56	27.2	7.6	0.0	0	17.1	-1.63
2020		658,777	20.89	22.1		42.0	11.67	33.2	9.2	0.0	0	20.9	3.8
2021		762,463	24.18	15.8	Post Zone 4 Expansion 1	30.5	8.47	56.6	15.7	0.0	0	24.2	3.3
2022	3.5% Growth	789,149	25.02	3.5		31.5	8.75	58.6	16.3	0.0	0	25.0	0.84
2023		816,769	25.9	3.5		32.6	9.06	60.6	16.8	0.0	0	25.9	0.86
2024		845,356	26.81	3.5		33.8	9.39	62.7	17.4	0.0	0	26.8	0.92
2025		874,944	27.74	3.5		35.0	9.72	64.9	18.0	0.0	0	27.8	0.94
2026	3.5% Growth plus 4.5 L/s HDU	1,047,479	33.22	19.8		41.9	11.64	77.7	21.6	0.0	0	33.2	5.47
2027	3.5% Growth	1,084,141	34.38	3.5		43.3	12.03	80.4	22.3	0.0	0	34.4	1.14
2028		1,122,086	35.58	3.5		44.8	12.44	83.3	23.1	0.0	0	35.6	1.22
2029		1,161,359	36.83	3.5		46.4	12.89	86.2	23.9	0.0	0	36.8	1.25
2030		1,202,006	38.12	3.5		48.0	13.33	89.2	24.8	0.0	0	38.1	1.28
2031	3.5% Growth plus 4.5 L/s HDU	1,385,988	43.95	15.3		55.4	15.39	102.8	28.6	0.0	0	44.0	5.84
2032	3.5% Growth	1,434,498	45.49	3.5		57.3	15.92	106.4	29.6	0.0	0	45.5	1.53
2033		1,484,705	47.08	3.5		59.3	16.47	110.2	30.6	0.0	0	47.1	1.6
2034		1,536,670	48.73	3.5		61.4	17.06	114.0	31.7	0.0	0	48.7	1.65
2035		1,590,453	50.43	3.5		63.5	17.64	118.0	32.8	0.0	0	50.4	1.69
2036	3.5% Growth plus 4.5 L/s HDU	1,788,031	56.7	12.4		71.4	19.83	132.7	36.9	0.0	0	56.7	6.3
2037	3.5% Growth	1,850,612	58.68	3.5		73.9	20.53	137.3	38.1	0.0	0	58.7	1.98
2038		1,915,384	60.74	3.5		76.5	21.25	142.1	39.5	0.0	0	60.7	2.05
2039		1,982,422	62.86	3.5	Post Zone 4 Expansion 2	56.6	15.72	169.7	47.1	0.0	0	62.9	2.14
2040		2,051,807	65.06	3.5		58.6	16.28	175.7	48.8	0.0	0	65.1	2.2
2041	3.5% Growth plus 4.5 L/s HDU	2,265,532	71.84	10.4		64.7	17.97	194.0	53.9	0.0	0	71.9	6.8
2042	2% Growth	2,310,843	73.28	2.0		65.9	18.31	197.8	54.9	0.0	0	73.3	1.4
2043		2,357,060	74.74	2.0		67.3	18.69	201.8	56.1	0.0	0	74.8	1.5
2044		2,404,201	76.24	2.0		68.6	19.06	205.8	57.2	0.0	0	76.2	1.5
2045		2,452,285	77.76	2.0		70.0	19.44	210.0	58.3	0.0	0	77.8	1.5
2046	2% Growth plus 4.5 L/s HDU	2,643,243	83.82	7.8		75.4	20.94	226.3	62.9	0.0	0	83.8	6.0
2047	2% Growth	2,696,108	85.49	2.0	Post Zone 3 West Construction	0.0	0	153.9	42.8	154.0	42.78	85.5	1.7
2048		2,750,030	87.2	2.0		0.0	0	157.0	43.6	157.0	43.61	87.2	1.7
2049		2,805,030	88.95	2.0		0.0	0	160.1	44.5	160.0	44.44	88.9	1.7
2050		2,861,131	90.73	2.0		0.0	0	163.3	45.4	163.0	45.28	90.6	1.7
2051	2% Growth plus 4.5 L/s HDU	3,060,266	97.04	7.0		0.0	0	174.7	48.5	175.0	48.61	97.1	6.5
2052	2% Growth	3,121,471	98.98	2.0		0.0	0	178.2	49.5	178.0	49.44	98.9	1.8
2053		3,183,900	100.96	2.0		0.0	0	181.7	50.5	182.0	50.56	101.0	2.1
2054		3,247,578	102.98	2.0		0.0	0	185.4	51.5	185.0	51.39	102.9	1.9
2055		3,312,530	105.04	2.0		0.0	0	189.1	52.5	189.0	52.5	105.0	2.1
2056	2% Growth plus 4.5 L/s HDU	3,520,692	111.64	6.3		0.0	0	201.0	55.8	201.0	55.83	111.7	6.6
2057	2% Growth	3,591,106	113.87	2.0		0.0	0	205.0	56.9	205.0	56.94	113.9	2.2
2058		3,662,928	116.15	2.0		0.0	0	209.1	58.1	209.0	58.06	116.1	2.3
2059		3,736,187	118.47	2.0		0.0	0	213.3	59.3	213.0	59.17	118.4	2.3
2060		3,810,911	120.84	2.0		0.0	0	217.5	60.4	218.0	60.56	121.0	2.6
2061	2% Growth plus 4.5 L/s HDU	4,029,041	127.76	5.7		0.0	0	230.0	63.9	230.0	63.89	127.8	6.8
2062	2% Growth	4,109,622	130.32	2.0	Post Zone 3 West Expansion	0.0	0	164.2	45.6	305.0	84.72	130.3	2.5
2063		4,191,814	132.92	2.0		0.0	0	167.5	46.5	311.0	86.39	132.9	2.6
2064		4,275,651	135.58	2.0		0.0	0	170.8	47.4	317.0	88.06	135.5	2.6
2065		4,361,164	138.29	2.0		0.0	0	174.2	48.4	324.0	90	138.4	2.9
2066	2% Growth plus 6 L/s HDU	4,637,603	147.06	6.3		0.0	0	185.3	51.5	344.0	95.56	147.0	8.6
2067	2% Growth	4,730,355	150	2.0		0.0	0	189.0	52.5	351.0	97.5	150.0	3.0
2068		4,824,962	153	2.0		0.0	0	192.8	53.6	358.0	99.44	153.0	3.0
2069		4,921,461	156.06	2.0		0.0	0	196.6	54.6	365.0	101.39	156.0	3.0
2070		5,019,890	159.18	2.0		0.0	0	200.6	55.7	372.0	103.33	159.1	3.1
2071	2% Growth plus 6 L/s HDU	5,309,504	168.36	5.8		0.0	0	212.1	58.9	394.0	109.44	168.4	9.3
2072	2% Growth	5,415,694	171.73	2.0		0.0	0	216.4	60.1	402.0	111.67	171.8	3.4
2073		5,524,008	175.17	2.0		0.0	0	220.7	61.3	410.0	113.89	175.2	3.4
2074		5,634,488	178.67	2.0		0.0	0	225.1	62.5	418.0	116.11	178.6	3.4
2075		5,747,178	182.24	2.0		0.0	0	229.6	63.8	426.0	118.33	182.1	3.5
2076	2% Growth plus 6 L/s HDU	6,051,338	191.89	6.4		0.0	0	241.8	67.2	449.0	124.72	191.9	9.8
2077	2% Growth	6,172,364	195.72	2.0		0.0	0	246.6	68.5	458.0	127.22	195.7	3.8
2078		6,295,812	199.64	2.0		0.0	0	251.5	69.9	467.0	129.72	199.6	3.9
2079		6,421,728	203.63	2.0		0.0	0	256.6	71.3	476.0	132.22	203.5	3.9
2080		6,550,163	207.7	2.0		0.0	0	186.9	51.9	561.0	155.83	207.8	4.3

Year	Growth Rate	Demand (m3/yr)	Demand (L/s)	YoY Change (%)	Reservoir Development Condition	Zone 3 ADD (m3/hr)	Zone 3 ADD L/s	Zone 4 ADD (m3/hr)	Zone 4 ADD L/s	Zone 5 ADD (m3/hr)	Zone 5 ADD L/s	Total (L/s)	Yearly Demand Increase (L/s)
2081	2% Growth plus 6 L/s HDU	6,870,382	217.86	6.4		0.0	0	196.1	54.5	588.0	163.33	217.8	10.1
2082		7,007,789	222.22	2.0		0.0	0	200.0	55.6	600.0	166.67	222.2	4.4
2083	2% Growth	7,147,945	226.66	2.0		0.0	0	204.0	56.7	612.0	170	226.7	4.4
2084		7,290,904	231.19	2.0		0.0	0	208.1	57.8	624.0	173.33	231.1	4.5
2085		7,436,722	235.82	2.0		0.0	0	212.2	58.9	637.0	176.94	235.9	4.7
2086	2% Growth plus 6 L/s HDU	7,774,673	246.53	6.4	Post Zone 3 West Expansion 2	0.0	0	221.9	61.6	666.0	185	246.6	10.8
2087		7,930,166	251.46	2.0		0.0	0	226.3	62.9	679.0	188.61	251.5	4.8
2088	2% Growth	8,088,769	256.49	2.0		0.0	0	230.8	64.1	693.0	192.5	256.6	5.1
2089		8,250,545	261.62	2.0		0.0	0	235.5	65.4	706.0	196.11	261.5	4.9
2090		8,415,556	266.86	2.0		0.0	0	240.2	66.7	721.0	200.28	267.0	5.5
2091	2% Growth plus 6 L/s HDU	8,773,083	278.19	6.4		0.0	0	250.4	69.6	751.0	208.61	278.2	11.2
2092		8,948,544	283.76	2.0		0.0	0	204.3	56.8	817.0	226.94	283.7	5.5
2093	2% Growth	9,127,515	289.43	2.0		0.0	0	208.4	57.9	834.0	231.67	289.6	5.9
2094		9,310,066	295.22	2.0		0.0	0	212.6	59.1	850.0	236.11	295.2	5.6
2095		9,496,267	301.12	2.0		0.0	0	216.8	60.2	867.0	240.83	301.1	5.9
2096	2% Growth plus 6 L/s HDU	9,875,408	313.15	6.4	Post Zone 3 West Expansion 3	0.0	0	225.5	62.6	902.0	250.56	313.2	12.2
2097		10,072,916	319.41	2.0		0.0	0	230.0	63.9	920.0	255.56	319.5	6.3
2098	2% Growth	10,274,375	325.8	2.0		0.0	0	234.6	65.2	938.0	260.56	325.7	6.3
2099		10,479,862	332.31	2.0		0.0	0	239.3	66.5	957.0	265.83	332.3	6.6
2100		10,689,460	338.96	2.0		0.0	0	244.1	67.8	976.0	271.11	338.9	6.6
2101	2% Growth plus 6 L/s HDU	11,092,465	351.74	6.4		0.0	0	253.3	70.4	1013.0	281.39	351.8	12.8

Table H2: Growth Rates

	Growth Rate	Growth Rate
Year	(-)	(%)
Near Future Growth	0.035	3.5
Long Term Growth Rate	0.02	2
Ultimate Growth Rate	0.02	2
	m3/year	L/s
HDU Growth Near Future	141912	4.5
HDU Growth Long Term	141912	4.5
HDU Growth Post LT	189216	6
	(-)	(%)
2022 - Ultimate	0.036	3.59
10 Year Growth Rate	0.062	6.16
10-25 Year Growth Rate	0.043	4.3
25-Ult Year Growth Rate	0.027	2.72
2010-2021 Growth	0.048	4.84

Table H3: Staged Peak Flow Rates

	Peak Flow Rate (L/s)						
	Existing	Zone4 Exp 1	Zone4 Exp 2	Zone 3 W const	Zone 3 W Exp	Zone 3 W Exp 2	Zone 3 W Exp 3
Zone 3 Reservoir	11.7	21.3	20.9	0.0	0.0	0.0	0.0
Zone 4 Reservoir	9.2	39.5	62.9	63.9	71.3	69.6	70.4
Zone 3 West Reservoir	0.0	0.0	0.0	63.9	132.2	208.6	281.4

Ultimate Storage Requirement:	50000	m3
Adl Storage Aft Z3W Constructed	25139	
Expansions	2	
m3/expansion	12569.5	

Table H4: Acheson Reservoirs - Maximum Supply Rates

Max Q's	ADD (L/s)	ADD (m^3/hr)	MDD (m^3/hr)	MDD (L/s)	Min Required Diameter (m)
Zone 3	21.3	76.5	137.7	38.3	0.180
Zone 4	71.3	256.6	461.9	128.3	0.330
Zone 3 West	132.2	476.0	856.8	238.0	0.449

MDD Mult: 1.8

Table H5: Acheson Reservoirs - Flow Allocation

Stage	Zone 3	Zone 4	Zone 5
Pre Zone 4 Expansion	56%	44%	0%
Post Zone 4 Expansion 1	35%	65%	0%
Post Zone 4 Expansion 2	25%	75%	0%
Post Zone 3 West Construction	0%	50%	50%
Post Zone 3 West Expansion	0%	35%	65%
Post Zone 3 West Expansion 2	0%	25%	75%
Post Zone 3 West Expansion 3	0%	20%	80%

Table H6: Acheson Reservoirs - Projected Storage Staging Zone 3 only TF

Reservoir	Pre Z4 Expansion		Zone 4 (Expansion 1)		Zone 4 Expansion 2		Zone 3 West Construction		Zone 3 West Expansion		Zone 3 West Expansion 2		Zone 3 West Expansion 3	
	Volume (m^3)	Percent	Volume (m^3)	Percent	Volume (m^3)	Percent	Volume (m^3)	Percent	Volume (m^3)	Percent	Volume (m^3)	Percent	Volume (m^3)	Percent
Zone 3	4334	55	4334	35	4334	25	0	0	0	0	0	0	0	0
Zone 4	3758	45	8861	65	12861	75	12861	50	12861	35	12861	25	12861	20
Zone 3 West	0	0	0	0	0	0	12000	50	25000	65	38000	75	51000	80
TOTAL	8092	24900	13195	100	17195	100	24861	100	37861	100	50861	100	63861	100

Table H7: Acheson Reservoirs - Upgrade Triggers

	Existing OK Until	Zone 4 Expansion 1 OK Until	Zone 4 Expansion OK UNTIL	Zone 3 West Construction OK UNTIL	Zone 3 West Expansion OK Until	Zone 3 West Expansion 2 OK Until	Zone 3 West Expansion 3 Ok Until
Total Demand (L/s)	32.5	62.0	85.1	129.5	204.7	280.0	355.2
Total Demand (m^3/hr)	117.0	223.2	306.4	466.2	736.9	1008.0	1278.7

Appendix I

Cost Estimates

Distribution Mains

ID	Label	Timing	Project Description	Length (m)	Start Node	Stop Node	Diameter (mm)	Unit Cost ($/m)	Cost ($)	Contingency (40%)	Total Cost ($)
1042	P-462	Near Future	Zone 1 Water Mains	173	J-354	J-355	300	$550	$95,200	$38,100	$133,300
1062	P-508	Near Future	Big Lake East Water Mains	338	J-165	J-376	200	$400	$135,200	$54,100	$189,300
1066	P-514	Near Future	Big Lake East Water Mains	63	J-91	J-381	200	$400	$25,200	$10,100	$35,300
1067	P-515	Near Future	Big Lake East Water Mains	345	J-381	J-382	200	$400	$138,000	$55,200	$193,200
1073	P-524	Near Future	Zone 2 Water Mains	767	J-384	J-385	350	$600	$460,200	$184,100	$644,300
1075	P-527	Near Future	Zone 4 Water Mains	906	J-387	J-280	350	$600	$543,600	$217,400	$761,000
1077	P-530	Near Future	Zone 2 Water Mains	439	J-389	J-669	250	$450	$197,600	$79,000	$276,600
1087	P-548	Near Future	Zone 5 Water Mains	455	J-400	Supreme Steel	300	$550	$250,300	$100,100	$350,400
1108	P-580	Near Future	Big Lake East Water Mains	273	J-173	J-429	200	$400	$109,200	$43,700	$152,900
1109	P-581	Near Future	Big Lake East Water Mains	203	J-429	J-160	200	$400	$81,200	$32,500	$113,700
1116	P-588	Near Future	Big Lake East Water Mains	431	J-435	J-436	200	$400	$172,400	$69,000	$241,400
1117	P-589	Near Future	Big Lake East Water Mains	232	J-436	J-455	200	$400	$92,800	$37,100	$129,900
1124	P-630	Near Future	Big Lake West Water Mains	485	J-505	J-82	200	$400	$194,000	$77,600	$271,600
1137	P-664	Near Future	Zone 2 Water Mains	228	J-385	PRV-16	350	$600	$136,800	$54,700	$191,500
1138	P-665	Near Future	Zone 4 Water Mains	753	PRV-16	J-386	350	$600	$451,800	$180,700	$632,500
1138	P-665	Near Future	Zone 4 Water Mains - Crossing	100	PRV-16	J-386	350	$2,000	$200,000	$80,000	$280,000
1181	P-718	Near Future	Zone 5 Water Mains	604	J-463	J-400	300	$550	$332,200	$132,900	$465,100
1185	P-722	Near Future	Zone 5 Water Mains	433	J-607	J-463	300	$550	$238,200	$95,300	$333,500
1191	P-728	Near Future	Zone 6 Water Mains	649	J-402	J-509	300	$550	$357,000	$142,800	$499,800
1192	P-729	Near Future	Zone 6 Water Mains	240	J-509	J-412	400	$750	$180,000	$72,000	$252,000
2144	P-687(2)	Near Future	Zone 6 Water Mains	327	J-719	J-626	400	$750	$245,300	$98,100	$343,400
1275	P-770	Near Future	Zone 1 Water Mains	124	J-536	J-540	300	$550	$68,200	$27,300	$95,500
1277	P-771	Near Future	Zone 1 Water Mains	171	J-541	J-536	300	$550	$94,100	$37,600	$131,700
1287	P-778	Near Future	Zone 1 Water Mains	557	J-547	J-541	300	$550	$306,400	$122,600	$429,000
1294	P-782	Near Future	Zone 1 Water Mains	391	J-536	J-547	300	$550	$215,100	$86,000	$301,100
1295	P-783	Near Future	Zone 1 Water Mains	382	J-547	J-542	350	$600	$229,200	$91,700	$320,900
1312	P-794	Near Future	Big Lake East Water Mains	167	J-553	J-435	200	$400	$66,800	$26,700	$93,500
1396	P-842	Near Future	Zone 1 Water Mains	175	J-579	J-582	300	$550	$96,300	$38,500	$134,800
1411	P-851	Near Future	Zone 4 Water Mains	488	J-280	J-588	400	$750	$366,000	$146,400	$512,400
1426	P-857	Near Future	Zone 4 Water Mains	235	PRV-15	J-591	350	$600	$141,000	$56,400	$197,400
1426	P-857	Near Future	Zone 4 Water Mains - Crossing	100	PRV-15	J-591	350	$2,000	$200,000	$80,000	$280,000
1427	P-858	Near Future	Zone 4 Water Mains	545	J-591	J-387	350	$600	$327,000	$130,800	$457,800
1430	P-860	Near Future	Zone 3 Water Mains	178	J-592	J-577	300	$550	$97,900	$39,200	$137,100
1450	P-871	Near Future	Big Lake West Water Mains	203	J-371	J-601	300	$550	$111,700	$44,700	$156,400
1451	P-872	Near Future	Big Lake West Water Mains	301	J-601	J-350	300	$550	$165,600	$66,200	$231,800
1460	P-878	Near Future	Big Lake West Water Mains	219	J-489	J-604	300	$550	$120,500	$48,200	$168,700
1461	P-879	Near Future	Big Lake West Water Mains	209	J-604	J-215	300	$550	$115,000	$46,000	$161,000
1501	P-901	Near Future	Zone 2 Water Mains	371	J-613	J-384	350	$600	$222,600	$89,000	$311,600
1528	P-914	Near Future	Zone 4 Water Mains	447	J-619	J-671	350	$600	$268,200	$107,300	$375,500
1549	P-927	Near Future	Zone 5 Water Mains	556	J-610	J-439	300	$550	$305,800	$122,300	$428,100
1553	P-929	Near Future	Zone 6 Water Mains	501	J-412	J-626	400	$750	$375,800	$150,300	$526,100
1574	P-941	Near Future	Zone 1 Water Mains	367	J-354	J-535	300	$550	$201,900	$80,800	$282,700
1580	P-944	Near Future	Zone 5 Water Mains	416	J-439	J-624	300	$550	$228,800	$91,500	$320,300
1605	P-946	Near Future	Zone 1 Water Mains	83	J-493	J-632	300	$550	$45,700	$18,300	$64,000
1606	P-947	Near Future	Zone 1 Water Mains	526	J-632	J-355	300	$550	$289,300	$115,700	$405,000
1613	P-949	Near Future	Big Lake East Water Mains	367	J-382	PRV-24	200	$400	$146,800	$58,700	$205,500

ID	Label	Timing	Project Description	Length (m)	Start Node	Stop Node	Diameter (mm)	Unit Cost ($/m)	Cost ($)	Contingency (40%)	Total Cost ($)
1614	P-950	Near Future	Big Lake East Water Mains	126	PRV-24	J-377	200	$400	$50,400	$20,200	$70,600
1615	P-951	Near Future	Big Lake East Water Mains	338	J-376	J-377	200	$400	$135,200	$54,100	$189,300
1626	P-959	Near Future	Zone 6 Water Mains	311	J-402	J-635	300	$550	$171,100	$68,400	$239,500
1712	P-971	Near Future	Big Lake East Water Mains	294	J-382	J-644	200	$400	$117,600	$47,000	$164,600
1934	P-662(1)	Near Future	Zone 2 Water Mains	122	J-388	J-669	300	$550	$67,100	$26,800	$93,900
1935	P-662(2)	Near Future	Zone 2 Water Mains	215	J-669	PRV-15	350	$600	$129,000	$51,600	$180,600
1937	P-995	Near Future	Zone 2 Water Mains	429	J-169	J-670	250	$450	$193,100	$77,200	$270,300
1939	P-844(1)	Near Future	Zone 4 Water Mains	493	J-387	J-671	350	$600	$295,800	$118,300	$414,100
1940	P-844(2)	Near Future	Zone 4 Water Mains	220	J-671	J-584	350	$600	$132,000	$52,800	$184,800
1940	P-844(2)	Near Future	Zone 4 Water Mains - Crossing	150	J-671	J-584	350	$2,000	$300,000	$120,000	$420,000
1942	P-913(1)	Near Future	Zone 4 Water Mains	407	J-386	J-672	350	$600	$244,200	$97,700	$341,900
1945	P-955(1)	Near Future	Zone 7 Water Mains	219	J-634	J-673	350	$600	$131,400	$52,600	$184,000
1948	P-996	Near Future	Zone 4 Water Mains	361	J-674	J-672	350	$600	$216,600	$86,600	$303,200
1960	P-955(2)(1)	Near Future	Zone 7 Water Mains	414	J-673	J-681	350	$600	$248,400	$99,400	$347,800
1962	P-997	Near Future	Zone 7 Water Mains	319	J-678	J-677	300	$550	$175,500	$70,200	$245,700
1963	P-998	Near Future	Zone 7 Water Mains	153	J-678	J-679	300	$550	$84,200	$33,700	$117,900
1964	P-999	Near Future	Zone 7 Water Mains	424	J-681	J-679	350	$600	$254,400	$101,800	$356,200
1973	P-1000	Near Future	Zone 1 Water Mains	111	J-683	J-474	300	$550	$61,100	$24,400	$85,500
1978	P-734(2)(1)	Near Future	Zone 1 Water Mains	288	J-684	J-686	300	$550	$158,400	$63,400	$221,800
1979	P-734(2)(2)	Near Future	Zone 1 Water Mains	208	J-686	J-493	300	$550	$114,400	$45,800	$160,200
2028	P-957(1)	Near Future	Zone 4 Water Mains	131	J-588	J-702	400	$750	$98,300	$39,300	$137,600
2029	P-957(2)	Near Future	Zone 6 Water Mains	470	J-702	J-635	300	$550	$258,500	$103,400	$361,900
2029	P-957(2)	Near Future	Zone 6 Water Mains - Crossing	150	J-702	J-635	300	$2,000	$300,000	$120,000	$420,000
2056	P-1007	Near Future	Zone 2 Water Mains	609	J-670	J-389	250	$450	$274,100	$109,600	$383,700
2057	P-1008	Near Future	Zone 5 Water Mains	561	J-624	J-391 (Dummy)	300	$550	$308,600	$123,400	$432,000
2058	P-1009	Near Future	Zone 7 Water Mains	205	J-677	J-649	300	$550	$112,800	$45,100	$157,900
2065	P-913(2)(1)	Near Future	Zone 4 Water Mains	329	J-672	J-713	350	$600	$197,400	$79,000	$276,400
2066	P-913(2)(2)	Near Future	Zone 4 Water Mains	418	J-713	J-619	350	$600	$250,800	$100,300	$351,100
2072	P-1016(1)	Near Future	Zone 6 Water Mains	575	J-584	J-715	300	$550	$316,300	$126,500	$442,800
2073	P-1016(2)	Near Future	Zone 6 Water Mains	1,232	J-715	J-696	300	$550	$677,600	$271,000	$948,600
2094	P-1018	Near Future	Zone 4 Water Mains	657	J-387	J-718	350	$600	$394,200	$157,700	$551,900
2095	P-1019	Near Future	Zone 4 Water Mains	554	J-718	J-591	350	$600	$332,400	$133,000	$465,400
2096	P-1020	Near Future	Zone 4 Water Mains	356	J-718	J-674	350	$600	$213,600	$85,400	$299,000
1052	P-486	Long Term	Big Lake West Water Mains	221	J-252	J-367	300	$550	$121,600	$48,600	$170,200
1063	P-510	Long Term	Big Lake East Water Mains	420	J-377	J-378	200	$400	$168,000	$67,200	$235,200
1064	P-512	Long Term	Big Lake East Water Mains	406	J-379	J-380	200	$400	$162,400	$65,000	$227,400
1110	P-582	Long Term	Big Lake East Water Mains	268	J-153	J-430	200	$400	$107,200	$42,900	$150,100
1111	P-583	Long Term	Big Lake East Water Mains	343	J-430	J-480	200	$400	$137,200	$54,900	$192,100
1112	P-584	Long Term	Big Lake East Water Mains	383	J-480	J-431	200	$400	$153,200	$61,300	$214,500
1113	P-585	Long Term	Big Lake East Water Mains	182	J-431	J-170	200	$400	$72,800	$29,100	$101,900
1140	P-671	Long Term	Big Lake East Water Mains	493	J-379	J-93	200	$400	$197,200	$78,900	$276,100
1149	P-684	Long Term	Zone 6 Water Mains	446	J-509	J-444	300	$550	$245,300	$98,100	$343,400
1150	P-685	Long Term	Zone 6 Water Mains	495	J-444	J-403	300	$550	$272,300	$108,900	$381,200
1153	P-688	Long Term	Zone 7 Water Mains	702	J-401	J-623	300	$550	$386,100	$154,400	$540,500
1180	P-717	Long Term	Zone 5 Water Mains	398	J-399	J-463	300	$550	$218,900	$87,600	$306,500
1269	P-767	Long Term	Zone 1 Water Mains	382	J-536	J-537	300	$550	$210,100	$84,000	$294,100
1273	P-769	Long Term	Zone 1 Water Mains	323	J-537	J-539	300	$550	$177,700	$71,100	$248,800

ID	Label	Timing	Project Description	Length (m)	Start Node	Stop Node	Diameter (mm)	Unit Cost ($/m)	Cost ($)	Contingency (40%)	Total Cost ($)
1290	P-779	Long Term	Zone 1 Water Mains	336	J-537	J-546	300	$550	$184,800	$73,900	$258,700
1402	P-845	Long Term	Zone 6 Water Mains	322	J-403	J-585	300	$550	$177,100	$70,800	$247,900
1403	P-846	Long Term	Zone 6 Water Mains	401	J-585	J-622	300	$550	$220,600	$88,200	$308,800
1423	P-855	Long Term	Zone 8 Water Mains	360	J-422	J-590	400	$750	$270,000	$108,000	$378,000
1530	P-915	Long Term	Zone 6 Water Mains	204	J-584	J-620	300	$550	$112,200	$44,900	$157,100
1531	P-916	Long Term	Zone 6 Water Mains	642	J-620	J-585	300	$550	$353,100	$141,200	$494,300
1544	P-924	Long Term	Zone 6 Water Mains	281	J-622	J-404	300	$550	$154,600	$61,800	$216,400
1547	P-926	Long Term	Zone 5 Water Mains	409	J-623	J-399	300	$550	$225,000	$90,000	$315,000
1554	P-930	Long Term	Zone 8 Water Mains	176	J-626	J-422	400	$750	$132,000	$52,800	$184,800
1558	P-932	Long Term	Zone 7 Water Mains	550	J-634	J-401	300	$550	$302,500	$121,000	$423,500
1564	P-935	Long Term	Zone 7 Water Mains	484	J-395	J-631	350	$600	$290,400	$116,200	$406,600
1565	P-936	Long Term	Zone 7 Water Mains	394	J-631	J-396	300	$550	$216,700	$86,700	$303,400
1617	P-952	Long Term	Big Lake East Water Mains	180	J-378	PRV-25	200	$400	$72,000	$28,800	$100,800
1618	P-953	Long Term	Big Lake East Water Mains	109	PRV-25	J-379	200	$400	$43,600	$17,400	$61,000
1625	P-958	Long Term	Zone 6 Water Mains	454	J-635	J-444	300	$550	$249,700	$99,900	$349,600
1961	P-955(2)(2)	Long Term	Zone 7 Water Mains	382	J-681	J-631	350	$600	$229,200	$91,700	$320,900
2021	P-518(1)	Long Term	Big Lake East Water Mains	192	J-346	J-700	300	$550	$105,600	$42,200	$147,800
2022	P-518(2)	Long Term	Big Lake East Water Mains	155	J-700	J-479	300	$550	$85,300	$34,100	$119,400
2031	P-1002	Long Term	Big Lake East Water Mains	200	J-382	J-703	200	$400	$80,000	$32,000	$112,000
2060	P-1011	Long Term	Zone 1 Water Mains	384	J-546	J-360	300	$550	$211,200	$84,500	$295,700
2067	P-1014	Long Term	Zone 6 Water Mains	520	J-404	J-715	300	$550	$286,000	$114,400	$400,400
2129	P-1026	Long Term	Zone 3 Water Mains	242	J-592	J-360	300	$550	$133,100	$53,200	$186,300
2129	P-1026	Long Term	Zone 3 Water Mains - Crossing	100	J-592	J-360	300	$2,000	$200,000	$80,000	$280,000
1043	P-465	Ultimate	Zone 1 Water Mains	310	J-355	J-356	300	$550	$170,500	$68,200	$238,700
1044	P-473	Ultimate	Zone 1 Water Mains	485	J-356	J-357	300	$550	$266,800	$106,700	$373,500
1045	P-474	Ultimate	Zone 1 Water Mains	444	J-357	J-358	300	$550	$244,200	$97,700	$341,900
1048	P-477	Ultimate	Acheson West Area Water Mains	715	J-621	J-361	300	$550	$393,300	$157,300	$550,600
1049	P-479	Ultimate	Acheson West Area Water Mains	745	J-362	J-363	300	$550	$409,800	$163,900	$573,700
1053	P-487	Ultimate	Acheson West Area Water Mains	553	J-367	J-368	300	$550	$304,200	$121,700	$425,900
1054	P-488	Ultimate	Acheson West Area Water Mains	1,171	J-368	J-370	300	$550	$644,100	$257,600	$901,700
1071	P-522	Ultimate	Acheson West Area Water Mains	1,213	J-359	J-365	300	$550	$667,200	$266,900	$934,100
1082	P-542	Ultimate	Zone 7 Water Mains	469	J-679	J-394	350	$600	$281,400	$112,600	$394,000
1084	P-544	Ultimate	Zone 7 Water Mains	820	J-396	J-397	300	$550	$451,000	$180,400	$631,400
1085	P-545	Ultimate	Zone 7 Water Mains	812	J-397	J-398	300	$550	$446,600	$178,600	$625,200
1091	P-556	Ultimate	Zone 6 Water Mains	807	J-406	J-407	300	$550	$443,900	$177,600	$621,500
1092	P-557	Ultimate	Zone 8 Water Mains	946	J-407	J-408	300	$550	$520,300	$208,100	$728,400
1093	P-558	Ultimate	Zone 8 Water Mains	849	J-408	J-409	300	$550	$467,000	$186,800	$653,800
1095	P-560	Ultimate	Zone 8 Water Mains	764	J-410	J-411	300	$550	$420,200	$168,100	$588,300
1097	P-567	Ultimate	Zone 8 Water Mains	793	J-421	J-626	300	$550	$436,200	$174,500	$610,700
1099	P-569	Ultimate	Zone 6 Water Mains	403	J-420	J-716	300	$550	$221,700	$88,700	$310,400
1127	P-647	Ultimate	Zone 6 Water Mains	874	J-622	J-406	300	$550	$480,700	$192,300	$673,000
1130	P-652	Ultimate	Acheson West Area Water Mains	201	J-365	J-440	300	$550	$110,600	$44,200	$154,800
1131	P-653	Ultimate	Acheson West Area Water Mains	724	J-361	J-441	300	$550	$398,200	$159,300	$557,500
1132	P-654	Ultimate	Acheson West Area Water Mains	813	J-441	J-362	300	$550	$447,200	$178,900	$626,100
1133	P-655	Ultimate	Acheson West Area Water Mains	555	J-440	J-441	300	$550	$305,300	$122,100	$427,400
1134	P-661	Ultimate	Acheson West Area Water Mains	57	PRV-14	J-621	300	$550	$31,400	$12,600	$44,000
1141	P-676	Ultimate	Big Lake West Water Mains	417	J-367	J-442	300	$550	$229,400	$91,800	$321,200

ID	Label	Timing	Project Description	Length (m)	Start Node	Stop Node	Diameter (mm)	Unit Cost ($/m)	Cost ($)	Contingency (40%)	Total Cost ($)
1155	P-690	Ultimate	Zone 8 Water Mains	838	J-423	J-407	300	$550	$460,900	$184,400	$645,300
1157	P-692	Ultimate	Acheson West Area Water Mains	809	J-365	J-363	300	$550	$445,000	$178,000	$623,000
1159	P-694	Ultimate	Acheson West Area Water Mains	477	J-370	J-445	300	$550	$262,400	$105,000	$367,400
1159	P-694	Ultimate	Acheson West Area Water Mains - Crossing	200	J-370	J-445	300	$2,000	$400,000	$160,000	$560,000
1397	P-843	Ultimate	Zone 1 Water Mains	419	J-637	J-358	300	$550	$230,500	$92,200	$322,700
1424	P-856	Ultimate	Zone 8 Water Mains	245	J-590	J-411	300	$550	$134,800	$53,900	$188,700
1438	P-864	Ultimate	Acheson West Area Water Mains	472	J-595	J-596	300	$550	$259,600	$103,800	$363,400
1438	P-864	Ultimate	Acheson West Area Water Mains - Crossing	150	J-595	J-596	300	$2,000	$300,000	$120,000	$420,000
1443	P-867	Ultimate	Acheson West Area Water Mains	646	J-596	J-598	300	$550	$355,300	$142,100	$497,400
1444	P-868	Ultimate	Acheson West Area Water Mains	860	J-598	J-400	300	$550	$473,000	$189,200	$662,200
1446	P-869	Ultimate	Acheson West Area Water Mains	312	J-592	J-599	300	$550	$171,600	$68,600	$240,200
1447	P-870	Ultimate	Acheson West Area Water Mains	796	J-599	J-595	300	$550	$437,800	$175,100	$612,900
1463	P-880	Ultimate	Big Lake West Water Mains	547	J-190	J-605	300	$550	$300,900	$120,400	$421,300
1540	P-921	Ultimate	Acheson West Area Water Mains	537	J-359	J-621	300	$550	$295,400	$118,200	$413,600
1543	P-923	Ultimate	Zone 6 Water Mains	443	J-420	J-585	300	$550	$243,700	$97,500	$341,200
1546	P-925	Ultimate	Zone 7 Water Mains	379	J-398	J-623	300	$550	$208,500	$83,400	$291,900
1636	P-965	Ultimate	Acheson West Area Water Mains	295	J-637	J-359	300	$550	$162,300	$64,900	$227,200
2034	P-881(1)	Ultimate	Big Lake West Water Mains	208	J-605	J-704	300	$550	$114,400	$45,800	$160,200
2035	P-881(2)	Ultimate	Big Lake West Water Mains	216	J-704	J-80 (Dummy)	300	$550	$118,800	$47,500	$166,300
2037	P-1003	Ultimate	Acheson West Area Water Mains	945	J-595	J-617	300	$550	$519,800	$207,900	$727,700
2043	P-1004	Ultimate	Zone 7 Water Mains	641	J-631	J-705	300	$550	$352,600	$141,000	$493,600
2043	P-1004	Ultimate	Zone 7 Water Mains - Crossing	200	J-631	J-705	300	$2,000	$400,000	$160,000	$560,000
2044	P-1005	Ultimate	Zone 8 Water Mains	368	J-410	J-706	300	$550	$202,400	$81,000	$283,400
2044	P-1005	Ultimate	Zone 8 Water Mains - Crossing	200	J-410	J-706	300	$2,000	$400,000	$160,000	$560,000
2046	P-960(1)	Ultimate	Zone 8 Water Mains	397	J-716	J-708	300	$550	$218,400	$87,400	$305,800
2047	P-960(2)	Ultimate	Zone 8 Water Mains	488	J-708	J-717	300	$550	$268,400	$107,400	$375,800
2052	P-534(1)	Ultimate	Zone 2 Water Mains	288	J-389	J-710	350	$600	$172,800	$69,100	$241,900
2053	P-534(2)	Ultimate	Zone 2 Water Mains	453	J-710	J-385	350	$600	$271,800	$108,700	$380,500
2055	P-1006	Ultimate	Zone 4 Water Mains	345	J-386	J-711	350	$600	$207,000	$82,800	$289,800
2061	P-1012	Ultimate	Zone 8 Water Mains	2,090	J-705	J-706	300	$550	$1,149,500	$459,800	$1,609,300
2061	P-1012	Ultimate	Zone 8 Water Mains - Crossing	250	J-705	J-706	300	$2,000	$500,000	$200,000	$700,000
2063	P-1013	Ultimate	Zone 8 Water Mains	1,188	J-706	J-712	300	$550	$653,400	$261,400	$914,800
2069	P-1015	Ultimate	Zone 4 Water Mains	433	J-711	J-713	350	$600	$259,800	$103,900	$363,700
2088	P-649(1)	Ultimate	Zone 8 Water Mains	405	J-421	J-716	300	$550	$222,800	$89,100	$311,900
2089	P-649(2)	Ultimate	Zone 8 Water Mains	437	J-716	J-423	300	$550	$240,400	$96,200	$336,600
2091	P-559(1)	Ultimate	Zone 8 Water Mains	436	J-409	J-717	300	$550	$239,800	$95,900	$335,700
2092	P-559(2)	Ultimate	Zone 8 Water Mains	411	J-717	J-410	300	$550	$226,100	$90,400	$316,500
2097	P-1021	Ultimate	Zone 8 Water Mains	821	J-408	J-712	300	$550	$451,600	$180,600	$632,200
2097	P-1021	Ultimate	Zone 8 Water Mains - Crossing	200	J-408	J-712	300	$2,000	$400,000	$160,000	$560,000
2101	P-1022	Ultimate	Zone 7 Water Mains	761	J-394	J-395	300	$550	$418,600	$167,400	$586,000
2112	P-1024	Ultimate	Acheson West Area Water Mains	991	J-364	J-445	300	$550	$545,100	$218,000	$763,100
2114	P-480(1)	Ultimate	Acheson West Area Water Mains	482	J-363	PRV-17	300	$550	$265,100	$106,000	$371,100
2115	P-480(2)	Ultimate	Acheson West Area Water Mains	355	PRV-17	J-364	300	$550	$195,300	$78,100	$273,400

ID	Label	Timing	Project Description	Length (m)	Start Node	Stop Node	Diameter (mm)	Unit Cost ($/m)	Cost ($)	Contingency (40%)	Total Cost ($)
								Length (m)	Cost ($)	Contingency (40%)	Total Cost ($)
							Near Future	28,372	$16,456,400	$6,582,400	$23,038,800
							Long Term	12,939	$6,964,700	$2,785,700	$9,750,400
							Ultimate	38,374	$22,946,800	$9,178,700	$32,125,500
							Total	79,685	$46,367,900	$18,546,800	$64,914,700

PRVs

PRV No.	Development Scenario	Supplying to Zone	Valve Size (mm)	Unit Cost ($/ea)	Cost ($)	Contingency (40%)	Total Cost ($)
PRV-A (Dual Valve)	Existing	1-2	300/100	$300,000	$300,000	$120,000	$420,000
PRV-15	Near Future	2	350	$350,000	$350,000	$140,000	$490,000
PRV-16	Near Future	2	350	$350,000	$350,000	$140,000	$490,000
PRV-24	Near Future	Big Lake West	200	$300,000	$300,000	$120,000	$420,000
PRV-18	Long Term	3	300	$325,000	$325,000	$130,000	$455,000
PRV-25	Long Term	Big Lake East	200	$300,000	$300,000	$120,000	$420,000
PRV-14	Ultimate	1	300	$325,000	$325,000	$130,000	$455,000
PRV-17	Ultimate	Big Lake West	300	$325,000	$325,000	$130,000	$455,000
					Cost ($)	**Contingency (40%)**	**Total Cost ($)**
				Existing	$300,000	$120,000	$420,000
				Near Future	$1,000,000	$400,000	$1,400,000
				Long Term	$625,000	$250,000	$875,000
				Ultimate	$650,000	$260,000	$910,000
				Total	$2,575,000	$1,030,000	$3,605,000

Pumphouses

Location	Development Scenario	Quantity	Capacity (L/s)	Variable/Constant Speed	Head (m)	Horsepower	Unit Cost ($/HP)	Cost ($)	Contingency (40%)	Total Cost ($)
Zone 4 Pumphouse - Reservoir	Near Future	1	50	Variable	51	45	$9,000	$405,000	$162,000	$567,000
		2	75	Variable	51	65	$9,000	$1,170,000	$468,000	$1,638,000
		2	150	Constant	51	130	$9,000	$2,340,000	$936,000	$3,276,000
Zone 3 West Pumphouse - Reservoir	Long Term	1	50	Variable	59	50	$9,000	$450,000	$180,000	$630,000
		2	75	Variable	59	75	$9,000	$1,350,000	$540,000	$1,890,000
		2	150	Constant	59	150	$9,000	$2,700,000	$1,080,000	$3,780,000
New Pumphouse-Reservoir/Zone 3 West Upgrade	Ultimate	TBD	500	TBD	60	500	$4,500	$2,250,000	$900,000	$3,150,000
						Capacity (L/s)	**Horsepower (HP)**	**Cost ($)**	**Contingency (40%)**	**Total Cost ($)**
					Near Future	500	435	$3,915,000	$1,566,000	$5,481,000
					Long Term	500	500	$4,500,000	$1,800,000	$6,300,000
					Ultimate	500	500	$2,250,000	$900,000	$3,150,000
					Total	1500	1435	$10,665,000	$4,266,000	$14,931,000

Reservoirs

Location	Development Scenario	Volume (m^3)	Unit Cost ($/$m^3$)	Cost ($)	Contingency (40%)	Total Cost ($)
Zone 4 Pumphouse - Reservoir Expansion	Near Future	4,000	$1,300	$5,200,000	$2,080,000	$7,280,000
New Zone 3 West Pumphouse - Reservoir	Long Term	12,000	$650	$7,800,000	$3,120,000	$10,920,000
New Zone 3 West Pumphouse - Supply Main	Long Term	300	$850	$255,000	$102,000	$357,000
New Pumphouse-Reservoir/Zone 3 West Upgrade	Ultimate	25,000	$1,000	$25,000,000	$10,000,000	$35,000,000
				Cost ($)	**Contingency (40%)**	**Total Cost ($)**
			Near Future	$5,200,000	$2,080,000	$7,280,000
			Long Term	$7,800,000	$3,120,000	$10,920,000
			Ultimate	$25,000,000	$10,000,000	$35,000,000
			Total	$38,000,000	$15,200,000	$53,200,000

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