WATER AND WASTEWATER MASTER PLAN UPDATES

for the

City of Steamboat Springs

Prepared by:

McLaughlin Water ENGINEERS, LTD.

December 2009

McLaughlin Water
ENGINEERS LTD.

December 8, 2009

The City of Steamboat Springs
c/o: Mr. Philo Shelton, Director of Public Works
137 10th Street
P.O. Box 775088
Steamboat Springs, Colorado 80477

RE: LETTER OF TRANSMITTAL – EXECUTIVE SUMMARY
WATER AND WASTEWATER MASTER PLAN UPDATES

Dear Mr. Shelton:

Submitted attached are the Water and Wastewater Master Plan Updates, revised to include staff review comments. The Master Plans should serve as a long range planning tool for the City's water and wastewater systems, providing guidance for implementing capital improvements to provide system reliability and meet future growth needs.

The need for the Master Plans has been driven by the substantial development planned to take place in the West Steamboat Springs Area (WSSA). At proposed buildout, this area could represent approximately 25 percent of the City's total ultimate water and wastewater needs.

The Plans have been based on the City's development projections as established in various planning studies, including the West Steamboat Springs Area Plan, Steamboat Springs Area Community Plan and Steamboat Water Supply Master Plan. The Urban Growth Area has been adopted as a logical service area.

Findings from the Master Planning include:

WATER

- ✓ Projected maximum day water demand is 7,340,000 gal/day at buildout of the City and WSSA (not including Mount Werner Water District).
- ✓ All treated water delivery from the southeast side of the City (Fish Creek and Yampa systems) leaves the City vulnerable during an outage due to emergency, or maintenance. Adequate fire flows cannot be provided to the west City/airport area.
- ✓ A 1.0 MG "West City" water storage tank, located near the airport, is recommended as a high priority.
- ✓ A booster pump station is required to provide sufficient pressure to replenish the proposed West City tank if the Elk River supply is not developed.
- ✓ The Elk River supply represents an excellent long term asset and is necessary to provide adequate service to the WSSA.

WASTEWATER

- Projected ultimate design day wastewater flow for the City and WSSA is approximately 3.2 MGD.
- Excessive infiltration & inflow (I/I) into the collection system represents a serious problem. I/I reduction could result in significant capital and O&M savings through eliminating or deferring treatment plant or interceptor sewer expansions/replacements.
- The existing Steamboat II lift station and trunk sewer are at capacity during periods of peak wet weather flows.
- Needed improvements at the treatment plant include addition of a second aerobic digester and overdue upgrades to existing process equipment.

We appreciate the opportunity to work with you on this important planning project.

Respectfully Submitted,
McLaughlin Water Engineers, Ltd.

Terrence P. Kenyon, P.E.

Ronald C. McLaughlin, P.E. & L.S.

Melanie S. Asquith, P.E.

Enclosure: Water and Wastewater Master Plan Updates

WATER AND WASTEWATER MASTER PLAN UPDATES
FOR
CITY OF STEAMBOAT SPRINGS, COLORADO

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SECTION I
INTRODUCTION

BACKGROUND

The City of Steamboat Springs ("City") owns and operates its water and sewer utilities. The City's water and wastewater systems are interrelated with the Mt. Werner Water District (District); capacity in the Fish Creek and Yampa River water supply facilities, in potable water storage tanks and transmission mains is shared; and wholesale water is delivered to the Steamboat II Metropolitan District. Steamboat's interceptor sewer and wastewater treatment plant also serve, by contract: the Mt. Werner W&S District, the Steamboat II Water & Sanitation District, and the Tree Haus District.

There are currently plans for substantial development to take place to the west of the City core area. These developments will have an impact on existing water and wastewater utilities and require significant investment in new infrastructure. Therefore, the City has recognized the need for comprehensive master planning to help guide the optimum growth of these systems.

PURPOSE

The purpose of this study is to create a Master Plan document that can serve as a long-range management tool for Steamboat Spring's water and wastewater systems.

The Master Plan will define, at a conceptual level, the size and locations for storage tanks, transmission/distribution piping, pump stations, lift stations and trunk sewers, and treatment facilities necessary to provide service to future developments. It also evaluates the existing systems to identify deficiencies and recommend improvements. It is intended to be a flexible document as to timing, presenting guidance for implementing physical improvements as dictated by system/development requirements.

For this master plan, the Regional ("Wholesale") facilities, including treatment, are primarily addressed. Regional facilities generally serve the entire City, or large tracts, and include: treatment plants, transmission and primary distribution mains, trunk sewers and interceptors, tanks, pump stations and lift stations. The

effects of the Local distribution and collection systems on Regional facilities (e.g., infiltration and flow patterns) are also considered in this report.

SECTION II
STUDY AREA DEFINITION, GROWTH AND DEMAND/FLOW PROJECTIONS

SERVICE AREA

The study area for the Water and Wastewater Master Plans is the Urban Growth Area as designated in recent planning reports adopted by the City. The intent of using the Urban Growth Area is to have a defined boundary to allow for efficient expansion of municipal services to undeveloped areas. This comparable region for both the water and wastewater utility planning provides a basis of inclusion for determining future demands and flow rates. The Urban Growth Boundary (UGB) established for this area is illustrated on the Water and Wastewater Master Plan Drawings bound at the back of this report.

Evaluation of the Mount Werner Water District was not included in the scope of this Master Plan; however, the City cannot be evaluated without consideration of the District's water and sewer needs due to the shared nature of both systems. Growth projections within the Mount Werner Water District were provided by the District for this Report.

LAND USE PLANNING AND GROWTH PROJECTIONS

A number of planning and engineering reports completed over the last decade have estimated current and projected growth and resulting population. The recent *Steamboat Water Supply Master Plan*, Stantec, November 2008, presented a detailed evaluation of historic and projected growth, related to water demands, for both the City and District.

Projected growth vs. time forecasts have been completed by the City (and District) and were also presented in the *Steamboat Water Supply Master Plan*. However, water and wastewater facilities, particularly pipelines, should be sized for projected ultimate development for greatest long term economy (since oversizing during initial construction involves relatively low incremental cost, and future paralleling would be extremely expensive).

Population projections are frequently relied on for establishing water demands and wastewater flows and have been presented in many of the planning and engineering reports and documents. The assumption is that population

increases are proportional to water/wastewater usage (i.e., if population doubles, water usage would also double). This approach is overly simplistic, particularly for resort communities and when the relative mix of commercial or Industrial customers, with very different demand requirements, may change over time.

The EQR (equivalent residential unit) is considered to provide a more accurate estimate of historic and projected demands, especially for communities like Steamboat Springs. This method uses a "common denominator" approach, establishing a typical single family residence as one EQR, to equate water demands and wastewater flows for different user categories. For Steamboat Springs, an EQR is considered to be a three bedroom, 2 bathroom home up to 2,500 square feet and equates to a maximum day water demand of 600 gpd and a design maximum day wastewater flow of 280 gpd with an organic loading of 0.6 lbs/BOD_5 per day.

Proposed land uses were provided by the City's Zoning Map and development tables. Ultimate development projections were derived from these for all land within the Urban Growth Boundary and EQR values established. Zoning/Land Use did delineate between single family estate, single family residential and multi-family residential. Therefore, flow projections could be made for each and translated to the planned development for residential water and wastewater flows. The Routt County Assessor's website was also used in areas where no other information was available.

After review of the City's present customer information, and the categories used for comprehensive planning, the customer base was analyzed using the following land use categories, together with assigned EQR values:
:

Type	EQR Units
Single Family Residence	1.00
Single Family Estate	1.50
Multi-Family (2 Bedroom)	0.85
Multi-Family (3 Bedroom)	1.05
Multi-Family (4 Bedroom)	1.25
Mobile Homes	1.00
Commercial	4.44/acre
Industrial	2.13
Parks/Open Space	Site Specific

Total EQRs in undeveloped areas were estimated from the Zoning Map acreages assuming full build-out of these areas. Information about future commercial/industrial build-out was obtained from various studies prepared by the developers and infill projections as provided by City staff.

The West Steamboat Springs Area (WSSA) lies to the northwest of the City. It includes, but is not limited to, the Steamboat II Metropolitan District (Steamboat II) and the proposed Steamboat 700 and Steamboat 360 developments. Steamboat II currently operates its own water and sewer collection systems; however, for long range planning purposes, it has been assumed that ultimately Steamboat II may be incorporated into the City's water and sewer utilities.

Although steady growth, primarily through infill, is projected within the existing City service area, the WSSA represents the predominant future growth in the Steamboat Springs area. Steamboat 700 and Steamboat 360 will account for the majority of growth in this area, proposing:

- Over 1600 Single Family Homes
- Approximately 1380 Multi-Family Homes
- Over 20 acres of Commercial Property.

Existing and projected EQR for the City, WSSA and Steamboat II, are presented in the following table. By using the EQR method of evaluating existing and future flows, the number of EQR does not directly correlate to the number of taps. For example, there are currently approximately 3,500 taps within the City, but more than 5,000 EQR. When a multi-family building with 20 three bedroom/two bath units is connected to the City system, they purchase a single tap for the building, but are considered 20 EQR from a system demand standpoint. EQR comparison allows an accurate technique for assigning water usage in addition to tap size and square footage.

Table II-A
EXISTING AND PROJECTED EQR

Entity	Existing EQR	Projected EQR	Total EQR
City	5,347	1,898	7,245
WSSA (less Steamboat II)	186	3,667	3,853
District	6,771	3,256	10,027
Steamboat II	406	47	453
Total	**12,710**	**8,868**	**21,578**

Probable Ultimate EQR within City Urban Growth Boundary – 11,551
Projected Mount Werner Water District EQR – 10,027
Projected Total EQR – 21,578

WATER DEMANDS

Maximum day demand is, rationally, the amount used to size raw water supply, treatment plant and pumping facilities. Actual instantaneous (generally referred to as "peak hour") demands vary throughout the day – with higher-than-average demands being exerted in the morning and evening hours and throughout the day, and lower-than-average demands being exerted at night. It is efficient to use treated water storage to supply the higher demand rates; tanks can be refilled at night, when supply capacity exceeds demand.

It is difficult to accurately estimate peak hour demands without detailed, specific data, since plant production records alone cannot account for the ballasting affect of the storage tanks. However, the City, through monitoring and evaluation of flow records, has established the following Diurnal Curve, Figure IV-B, for modeling purposes.

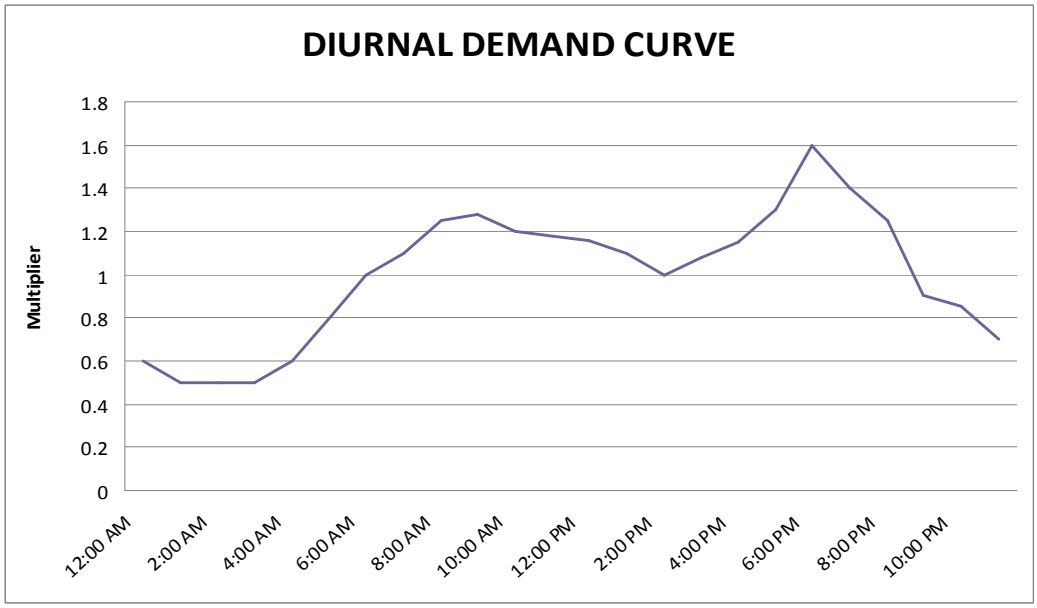


Figure II-A City Established Diurnal Curve

The distribution system, while being supplied by the treatment plant and treated water storage tanks, must be able to supply peak hour demands. In addition, the distribution system is designed to provide fire protection flows (during maximum day average demand rate).

The use of a diurnal curve helps the model account for the varying instantaneous water demands throughout the day. Typically, a system curve will show peak water usage between the hours of 6 a.m. and 8 a.m. with an hourly peak of at least 2 times the maximum daily demand. As seen above, Steamboat's usage is less dynamic throughout the day, with the peak seen at 6 p.m. and a multiplier of only 1.6.

With emphasis on water conservation and the use of automatic lawn irrigation systems – coupled with an increase in evening and night use for irrigation, the trend should be a lowering of the peak flow rate. Therefore, the curve can be used with reasonable confidence.

Historical maximum day requirements can be approximated from treatment plant production records. Water production rates at the water treatment plant have been evaluated for the years 2003-2008. A trend in the peaking factors from daily demands has been calculated and can be seen in the following Table II-C.

Table II-B
Historic Water Production Rates

Year	City Yearly Demand, gal.	District Yearly Demand, gal.	City Average Daily Demand, gal.	District Average Daily Demand, gal.	Maximum Daily Production, gal.	Peaking Factor
2003	473,295,000	553,481,000	1,292,985	1,514,910	6,634000	2.36
2004	448,440,000	462,035,000	1,212,831	1,259,936	5,275,000	2.13
2005	452,635,000	473,313,000	1,232,853	1,289,225	6,010,000	2.38
2006	473,706,000	507,881,000	1,295,558	1,388,881	6,066,000	2.26
2007	480,402,000	543,152,000	1,312,745	1,485,302	6,631,000	2.37
2008	389,574,000	594,640,000	1,062,525	1,622,805	5,782,000	2.15
					Average	**2.28**

The data indicates an average peaking factor of 2.28 (maximum to average day) for the last six years. The *Steamboat Water Supply Master Plan, Stantec, November 2008* averaged 23 years of data and determined that 2.4 was a reasonable City peaking factor.

Summary – Water Supply Requirements

The *Steamboat Water Supply Master Plan* provided a detailed evaluation of the past and projected water use within both the City and the District. The average, maximum day and total demands per EQR established in that report are presented in the following tables. That study defined an EQR as 140 fixture unit points (FUP).

Year	City, gpd Per EQR	District, gpd Per EQR	Total, gpd Per EQR
2004	232	231	232
2005	230	232	231
2006	241	241	241
2007	237	247	242
Average	**235**	**238**	**237**

Steamboat Water Supply Master Plan, Stantec, November 2008

	Maximum Day Demand (gpd per EQR)
City	547
Mt. Werner	573
Combined	541

Steamboat Water Supply Master Plan, Stantec, November 2008

A detailed review of treated water production records verified the above numbers. Based on review of the established water demands per EQR from the report a maximum day water demand of 600 gpd per EQR is considered reasonable and has been used for this Master Plan and all calculations herein. A breakdown of maximum day demand by customer classifications is presented in Table II-C following.

Table II-C – Projected Water Demand for City and WSSA

Customer Classification	EQR Units	Maximum Day Demand/EQR (gpd)	Total Design Day Demand (gpd)
Residential	3481	600	2,088,600
Residential Estate	2273	600	1,363,800
Multi-Family (2 Bedroom)	111	600	66,600
Multi-Family (3 Bedroom)	1509	600	905,400
Multi-Family (4 Bedroom)	274	600	164,400
Mobile Homes	802	600	481,200
Commercial (includes park facilities)	2671	600	1,602,600
Industrial	430	600	258,000
Parks (75 acres irrigated)	675	600	405,000
		Estimated Maximum Day Demand	7,335,600

Note that the projected total EQRs at buildout for the Mount Werner Water District is 10,027. At the established 600 gal/EQR/day, the District's projected maximum day demand would be 6,016,200 gallons. This results in a total required treatment plant capacity of approximately 13,350,000 gallons/day to meet the combined (City, District and WSSA) maximum day demand. It would be reasonable to plan total future treatment requirements for 14 MGD.

WASTEWATER FLOWS

Design wastewater flows were provided by the City, developed from existing plant influent records, infiltration and inflow (I/I) monitoring data and the preceding growth projections. The current maximum day plant flow rate in dry months is approximately 2.93 MGD, and the maximum daily flow during wet months (with reasonable allowance for I/I) is 6.07 MGD. Reported maximum month flows are 2.60 MGD (dry weather) and 4.8 MGD (wet weather).

Wastewater flow rates were calculated using the EQR approach, as presented in Section II, to equate flows for different land use designations. For the City, an EQR was determined to represent a design day wastewater flow rate of 280 gallons with an organic loading of 0.6 lbs./BOD_5 per day, including a reasonable allowance for I/I.

Existing loads were calculated using the platted lots and acreages depicted on the zoning maps. Single and multi-family EQRs were counted directly from the platted lots. Commercial and Industrial EQRs were calculated using the square footage of the buildings (if available) or by the acreages for the various land uses.

Projected Wastewater Flows

As shown in Table II–D, the projected ultimate wastewater flows are:

Designation	EQR Units	Design Day Unit Flow (gpd)	Total Design Day Flow (gpd)
Residential	3481	280	974,680
Residential Estate	2273	280	636,440
Multi-Family (2 Bedroom)	111	280	31,080
Multi-Family (3 Bedroom)	1509	280	422,520
Multi-Family (4 Bedroom)	274	280	76,720
Mobile Homes	802	280	224,560
Commercial (includes park facilities)	2671	280	747,880
Industrial	430	280	120,400
Approximate Design Day City Flow			3,234,280

Table II-D – Projected Wastewater Flows for City and WSSA

As with the water demands, the projected buildout EQR for the Mount Werner Water District is 10,027. At the established 280 gal/EQR/day, the District's projected design maximum day flow is 2,808,000 gallons. This results in a required treatment plant capacity of approximately 6,042,000 gallons/day to meet the combined (City, District and WSSA) maximum day flow. The projected peak flow rate is approximately 11.4 MGD. With the addition of the measured, excess I/I of 2,802,000, estimated peak flow to the plant is approximately 14.2 MGD.

Sewers must be designed to convey the peak hydraulic (instantaneous peak) flows. Peaking factors vary by flow amounts (or number of connected customers). Peaking factors are highest with fewer connected users and decrease as customers are added; therefore, the lowest peaking factor occurs at the treatment plant.

Figure II-B presents the peaking factors used in the sewer capacity model analysis.

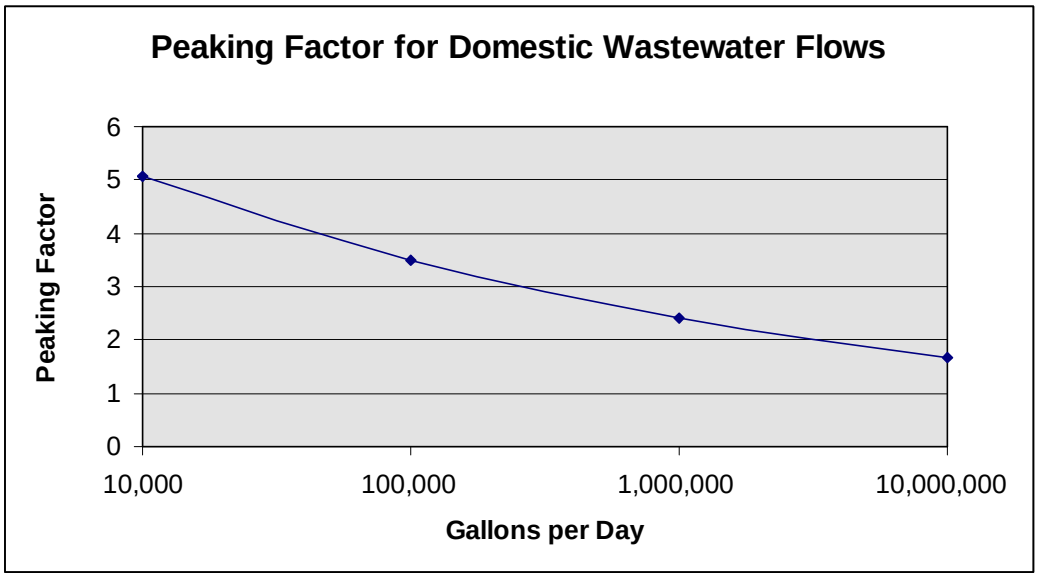


Figure II-B

*(City and County of Denver, Wastewater Design Criteria, 2008 - modified)

INFILTRATION & INFLOW

Numerous studies have been completed addressing the City's Infiltration/Inflow problem. A detailed compilation of the then available information was presented in the 2000 Wastewater Facility Plan. These studies found that as much as 50% of the total annual wastewater flow was due to I&I. Of this, about half was rainfall/snowfall-dependent, occurring between March and July. Since then, the City has attempted to reduce I&I contributions by sealing manholes, in-situ lining of aging, cracked sewers and identifying sump pump or storm drain connections. However, the flows recorded at the monitoring manholes during peak wet weather still indicate that approximately 50% of the wastewater flows is from I&I. In 2008, an instantaneous peak flow of 10 MGD was recorded; 90% of the rated plant hydraulic capacity. The maximum day flows in the dry season are approximately 35% of capacity.

Data from the City's Monitoring Manholes, at eight locations throughout the historic neighborhoods where high levels of infiltration would be expected, was used to estimate excess I/I. Flow monitoring was resumed in February of this year and included the historically high infiltration months of March and April, as well as the dryer month of July for comparison. The location of the monitoring manholes also allowed for estimation of I/I flows from the District. The estimated

peak rate of excess I/I is 2.8 MGD, with about 0.4 MGD of this from Steamboat II.

Most of the infiltration is known to exist in the neighborhoods with the oldest sewers. The City has begun the task of identifying and correcting any and all non-domestic sewage discharges to the system (roof top drains, sump pumps, etc.) and has imposed a schedule of maintenance and repair for the most critical areas. This has already resulted in a reduction in I/I.

Since new sewers and service lines are all gasketed PVC pipe, with wyes or service saddles, and installed under City review and inspection, future I/I flow allowances are expected to be minimal. Therefore no additional values for excess I/I have been assigned to projected growth areas.

WATER TREATMENT

There are two sources for treated water supply, the Fish Creek Filtration Plant and the Yampa River Infiltration Galleries/Filtration Plant.

Fish Creek Filtration Plant

The Fish Creek Filtration Plant is located near the mouth of Fish Creek Falls Canyon in the Mt. Werner Water District. The plant water supply is from Fish Creek with Fish Creek Reservoir and Long Lake providing raw water storage. The plant treatment process is conventional filtration and includes:

- Chemical feed – aluminum sulfate and polymer.
- Flocculation – approximately 10,000 gallon flocculation basins with vertical paddle flocculators.
- Sedimentation – utilizing 7-1/2° tube settlers.
- Mixed-media filtration – 144 sq. ft. surface area.
- Disinfection - on site hypochlorite generation.
- Filter backwash waste flows to a lagoon on the plant site.

The plant was originally constructed in 1971 by the Mt. Werner District. The District and City entered into an agreement in 1983 to "share" ownership/capacity in the treatment plant and increased the capacity from 1.5 million gallons per day (MGD) to 4.5 MGD. Additional expansions in 2001 and 2007, by the District and City respectively, brought the plant to its current capacity of 7.5 MGD. The City owns six of the ten filter trains; the District four. One filter train is leased back to the District, resulting in approximately 50/50 delivery of treated water to the City and District systems.

The existing raw water supply and chemical feed systems dictate an ultimate plant capacity of approximately 12 MGD. The plant is considered to be in good condition and is well maintained. It has been planned for logical expansion to an ultimate capacity of 12 MGD through the addition of six filter trains.

Yampa River Infiltration Gallery System

The Yampa River Infiltration Gallery System, located in the southwest corner of the City, is predominantly used to meet peak summer demands. The system consists of:

- Three horizontal infiltration galleries constructed in the late 1980's, one owned by the City and two by the District. The galleries were constructed in the river alluvium at a reported depth of 25 to 30 feet.
- Raw water pumping for each gallery.
- A treatment plant, constructed in 1998, for iron and manganese removal, utilizing oxidation and filtration.
- Chlorine disinfection.
- Treated water pumping into the distribution system.
- Backwash waste disposal to the sanitary sewer system.

The Yampa Gallery System has the capacity of 1.8 MGD; the filter plant has been rated at 2.0 MGD. The City's Yampa capacity is 0.8 MGD.

The City and District have initiated evaluation and planning for increasing the treated water capacity of the Yampa system supply to about 3.5 MGD. A memorandum report, Civil Design Consultants (CDC), June 2009, reviewed the existing system capacities and recommended further evaluation/improvements to increase capacity. The report identified a sustainable yield of 1.8 MGD for the infiltration galleries and the probable need for additional treatment for iron/manganese removal. It was concluded that physical expansion of the supply was achievable but would require construction of additional infiltration galleries and associated raw water pumping, additional treatment and finished water pumping. It recommended pilot testing to verify the maximum existing filtration capacity. It was also noted that the existing treatment plant and site did not provide for expansion of capacity; i.e., addition of treatment capacity will likely require land acquisition.

TRANSMISSION/DISTRIBUTION SYSTEM

The City also owns and maintains approximately 59 miles of water mains. Pipe materials predominantly include cast iron, ductile iron and PVC. These pipelines have been installed over the last 100 years, and added to and repaired as growth and maintenance have required. The mains are generally in reasonable condition, consistent with their age. Note that the expected life of existing ductile

iron pipe installed in west areas of the City has been shorter than typical due to the corrosive soils west of the City; therefore, PVC pipe is the preferred material in these areas.

STORAGE

The City is served by 5 storage tanks, with a combined total volume of 4.5 million gallons (MG), which provide water to meet peak demands and fire flow/emergency reserve. The Fish Creek WTP Clearwell and Skyline Tank capacity are shared with the Mt. Werner Water District. The WTP Clearwell serves both the City's Fish Creek Upper Zone and the District's Middle Zone. The Willett Tank, using a two-way metering system, feeds water to the City's Main Zone or the District's Low Zone, depending on the energy gradient.

Ownership of the Steamboat II Tank is also shared with the Steamboat II Metropolitan District. Table III-A following sets forth total tank capacities, the City's share of ownership and associated data. The tanks are considered to be in generally good condition.

Table III-A Existing Water Storage Tanks

Tank Name	Total Capacity (Gallons)	City Capacity (Gallons)	Base Elevation (ft.)	Overflow Elevation (ft.)	Tank Diameter (ft.)
Fish Creek Plant	2,000,000	1,000,000	7166	7187	130
Willett Heights	1,000,000	1,000,000	7001	7018	100
Fish Creek Falls Road	250,000	250,000	7257	7274	50
Skyline	250,000	125,000	7452	7470	50
Steamboat II	1,000,000	500,000	6866.7	6885.7	93
Total	**4.50 MG**	**2.875 MG**			

PRESSURE ZONES

The existing pressure zones include:

- The East City High Zone providing service to approx. elevation 7326,
- The Fish Creek Upper Zone providing service to approx. elevation 7170,
- The City Main Zone providing service to approx. elevation 6913 and a small pressure reduced zone at the Riverside Subdivision.

SECTION IIIS
EXISTING WASTEWATER SYSTEM

WASTEWATER COLLECTION

Gravity Collection System. The collection system includes approximately 57 miles of sewers. The various types of pipeline materials used include Polyvinyl Chloride (PVC), Vitrified Clay Pipe (VCP), Ductile Iron Pipe (DIP) and Fiberglass Pipes (Flexstran). Information on the condition of trunk sewers was obtained from City staff. The City has an ongoing televising, cleaning and maintenance program, with much of the information on the condition of existing sewers obtained from the TV logs.

Most reaches of the interceptor pipelines are installed in low lying areas near the river and where shallow groundwater is likely to be encountered. The potential for significant I&I is very high for the interceptor sewer pipelines and manholes, a problem which is exacerbated since much of the older interceptor sewer is constructed of VCP pipe, which has more numerous joints on a joint per lineal foot of sewer basis than PVC pipe. Additionally, brittle (rigid) pipe materials such as VCP typically have a greater potential for I&I problems associated with cracks in the pipe itself. Smoke testing and inspections by City staff have also identified roof drains and sump pump connections.

Steamboat II Lift Station. A wastewater lift station is provided to pump sewage from the 10" Steamboat II sewer pipeline which crosses under the Yampa River to the pretreatment building. Flows from various plant drains and sewers are also piped to the lift station. The lift station generally contributes about 5% of the total plant's influent flow during dry weather flows; however, flows in excess of 10 percent have been recorded during excessive I/I events.

This lift station consists of a wetwell and drywell that are each about 29' deep. A slide rail-mounted screen basket is located on the 10" sewer as it enters the wetwell to remove large solids from the flow. Two 15 HP centrifugal non-clog pumps, each pump with a nominal rating of 600 gallons per minute (0.864 MGD) are located in the drywell. An 8" force main transfers flow from the lift station to the pretreatment works. Flow velocity in the 8" pipe is about 3.8 feet per second

at the 600 gpm flow rate. The pumps have emergency standby power and will continue to function in the event of a power failure.

Design criteria calls for each pump to be sized for peak flows, providing full redundancy. The lift station is essentially at capacity based on recorded peak wet weather flows of about 845,000 gpd.

Use of the slide rail-mounted screen basket is potentially dangerous and overly cumbersome. If the basket is left in place and becomes excessively plugged, a backup of the 10" sewer pipeline under the Yampa River could occur and cause a backup of the gravity sewers from Steamboat II.

WASTEWATER TREATMENT

The Steamboat Regional WWTF was constructed in 1981 with an original design capacity of 2.5 MGD. Aerated lagoon treatment systems, which were then in use by the City of Steamboat Springs, Mount Werner Water and Sanitation District, and Steamboat II Water and Sanitation District, were removed from service when the new plant was commissioned.

Improvements were made in 1988 to increase the effective capacity of the secondary clarifiers. These improvements allowed for the increase of the WWTF's permitted capacity to 3.4 MGD/6.0 MGD (dry/wet weather). Additional improvements were constructed in 1996 to replace the mechanical bar screen with a new unit having finer spacing and to provide additional interim tankage for aerobic sludge digestion. The last major expansion was completed in 2001 increasing the permitted capacity to 5.0 MGD (July through February) and 7.5 MGD (March through June). Permitted peak hydraulic capacity is 11.0 MGD.

Unit Processes Summary

Table III-B provides a summary of unit treatment processes and key associated equipment. Physical and operational capacities are listed where applicable.

Table III-B Wastewater Treatment Plant Processes

Unit Process	Unit Process Features/Descriptions
PRELIMINARY TREATMENT	
Bar Screens	2 ea. 3' wide mechanical rotating drum screens with inclined auger/compactor, manual bypass bar screen
Aerated Grit Chamber	Volume ≈ 18,000 gallons t_d ≈ 4.3 minutes @ 6.0 MGD
Influent Flow Measuring	24" Parshall flume with ultrasonic sensor, current calibration of 0 to 6 MGD
SECONDARY TREATMENT	
Activated Sludge Basins (four in parallel)	Total Volume ≈ 3,360,000 gal. t_d ≈ 11.4 hrs. @ 7.5 MGD
Two clarifiers, two clariflocculators (in parallel)	Rapid sludge removal with separate RAS & WAS Surface Area ≈ 2 @ 1,960 sq. ft.; 2 @ 2830 sq. ft.
Effluent Holding & Polishing Pond (optional) Land Treatment Equalization Pond (optional)	Volume ≈ 2.5 MG t_d = 17.1 hours @ 3.4 MGD t_d = 10.0 hours @ 6.0 MGD
DISINFECTION	
Ultraviolet Disinfection Chlorination System	5.5 MGD nominal flow 11.0 MGD peak hour flow For land application
Effluent Flow Measuring Device and Recorder	18" Parshall flume with ultrasonic sensor
EFFLUENT LAND APPLICATION SYSTEM: 0.5 MGD nominal design capacity	
Land Treatment Pumps	Two 40 HP vertical turbine, each @ 700 gpm 9 hr./day typical operation
Storage Reservoir	53 acre-feet, 34.5 day detention at 0.5 MGD avg. design day
Land Treatment Booster Pumps (Upper System)	2 centrifugal: 415 gpm @ 84 ft. TDH 700 gpm @ 53 ft. TDH 2 MGD peak pumping capacity
Sprinkler Irrigation System	72 acres City-owned 28 acres leased

Unit Process	Unit Process Features/Descriptions
SLUDGE MANAGEMENT	
Aerobic Sludge Digestion Sludge holding basins	465,000 gals. 2 @ 150,000 gal. ea.
Spray Sludge Land Application	42 acres City-owned 28 acres leased
Contract Sludge Disposal	Contractor supplies tanker trucks and pumps and permits application sites.

Based on current flows/loadings, the plant is at approximately 64 percent of rated hydraulic capacity and 61 percent of organic capacity. In April 2008, an instantaneous peak flow of approximately 10 MGD was recorded, about 90 percent of rated peak hydraulic capacity.

The existing plant is in generally good condition; however, the original two treatment trains (1981-"west plant") are showing expected signs of almost 30 years of use.

The existing mechanical bar screens are not efficient at removing solids, allowing material to pass through and creating downstream operational problems. Because only one aerobic digester was added in the 2001 expansion (two were originally planned for but one deferred because of budget constraints), one of the west aeration basins is used for sludge holding/digestion. The UV disinfection process is approaching design capacity based on peak hydraulics (11 MGD). Provision in the existing UV system allows for the easy addition of two more modules. Some of the manual slide gates are extremely difficult to operate and should be replaced. Most of the "west plant" equipment is original. Mechanical and electrical/control equipment is in need of repair, upgrade or replacements (some of which has been postponed for budget reasons. In addition, due to budget constraints, needed ongoing maintenance has been deferred.

GENERAL

A municipal water system has many components – from service lines/meters, fire hydrants, water transmission pipes, storage tanks, to water treatment. For any one component to function, the others must also be operable. To provide good customer service, at the lowest long-term cost, all of these components must be integrated into a balanced system.

This Water System Master Plan is intended to represent an optimum system design. It considers the functional value of the City's investment in existing water facilities – and provides overview guidance for extension of service for projected ultimate development.

The progression of capital improvement projects should start with the Master Plan. However, the City should conduct a Predesign Phase before proceeding to final design and construction. The Master Plan is schematic in nature; and revised development, street layouts, etc. may result in facility designs that are somewhat different from those illustrated on the Master Plan – but which still effectively accomplish the intended purpose.

Water usage rates vary significantly seasonally, as well as throughout the day. Treated water supply facilities (treatment plants and pump stations) are typically designed to provide maximum day water demands; i.e., the maximum quantity of water used in any 24 hour period. This generally occurs on hot, dry summer days. Peak hour, the incremental portion of the maximum rate of water used in any 60 minute period (but expressed as a daily rate) is most economically provided from system storage. The maximum day and peak hour demands can vary considerably, from year to year, depending on many factors such as temperature, rainfall, construction and industrial activities, etc.

DESIGN CRITERIA

The following criteria were used for development of this Water Master Plan:

- Projected ultimate maximum day City demand, including the WSSA, is approximately 7.34 MGD; estimated peak hour demand is 11.74 MGD.

- Needed water treatment capacity and pumping should be based on Maximum Day demands.

- Size regional transmission mains to meet Peak Hour demands.

- Pressure zone “blue lines”, per City policy, be established to provide a minimum pressure at the highest fixture unit of not less than 40 psi.

- Typical distribution piping design standards are:
    - Generally, the minimum pipe size should be 8 inch.
    - Principle streets and commercial areas should be 10-inch to 12-inch minimum pipe size.
    - The system should be “looped” wherever possible, to prevent dead ends.

- Assure that adequate fire flows will be available for all regions. Recommended target ranges used for sizing water facilities for fire flows, typical in the industry, are:
    - Minimum 1,500 gpm for residential/multi-family.
    - 3,000 to 3,500 gpm for commercial, very high density.
    - Possible intermediate level (~2,500 gpm), depending on zoning.

Treated Water Supply

Existing City water treatment capacity, as described in Section III, is 4.55 MGD. The current City demand of approximately 3.3 MGD represents roughly 72% of the City’s available treated water supply.

Additional planned capacity is available through:

- Expansion of Yampa Gallery System = 0.85 MGD
- Addition of three filter trains at the Fish Creek Water Treatment Plant = 2.25 MGD.

The total planned (future) City treated water supply is then 7.65 MGD.

Maximum day demand at buildout within the City limits, not including Mount Werner Water District, WSSA, or Steamboat II, will be approximately 4.35 MGD,

about 95 percent of available treated water supply. If one filter train (0.75 MGD) were out of service, demand would exceed available supply.

As mentioned previously, treated water supply to WSSA is hydraulically limited by reasonable system transmission capacity. Therefore, from a hydraulic standpoint, development of the Elk River supply system is needed when the WSSA approaches 20 percent, or approximately 800 EQR. In addition to the hydraulic limitations, long residence times affect water quality. Addition of the Elk River supply also improves system reliability for fires/emergencies.

Storage

Treated water storage is an essential element of a water system. The primary functions served by distribution storage are:

- Operational storage for:
  1. Equalizing the fluctuating demands on the system (meeting peak demands), resulting in smaller treatment plants, pump stations and transmission mains.
  2. Minimizing pressure fluctuations within the distribution system.
  3. Providing overall system reliability.

- Providing reserve for fire fighting.

- Emergency storage.

Operational Storage. Storage volume necessary to meet hourly fluctuations in water demands generally ranges from 25 to 33 percent of maximum day use.

Fire Fighting Requirements. Fire protection storage volume is based on the fire flow rate and duration, as established by the Insurance Services Office (ISO), Uniform Fire Code and other regulatory bodies. The required flows depend on the size, type of construction, occupancy, and exposure of buildings within and surrounding a block or building group complex. The required duration for a fire flow of 2,500 gpm or less is 2 hours and 3 hours for a fire flow of 3,500 gpm, resulting in a volume of 630,000 gallons. Total design fire protection flow volume should be reserved as a portion of the total water storage. For design purposes, a fire is considered to occur on a day of maximum water usage. Acceptable fire flows should be realized while maintaining a 20 PSI minimum residual pressure.

Emergency Reserve. The amount of storage allocated to emergency reserve is based on the potential for interruption of supply by failure of the supply works (e.g. transmission line breaks, pump failure, or power failure) and the time needed for repairs. It is also a function of the reliability of the treated water supply facilities, including the number and types of sources. For Steamboat Springs's system, an emergency storage volume of approximately 8 hours on a day of average demand has been used.

Location. In general, a water distribution system is better served if the supply (treatment plants and pump stations) and storage tanks are located in different areas of the distribution system, as opposed to one central location. The location of storage in the system has significant impacts on hydraulics, operating costs, and reliability. The location of both the treated water supply and storage on the same side of the demand center (as is the case for Steamboat Springs) is the least desirable option. Also, storage should be as close to the demand center as practical to achieve maximum benefits at minimum cost. It has been well documented (and can be readily verified hydraulically) that location of storage, or supply, on the opposite sides of the demand center is optimum. Advantages include:

- This produces two relatively independent "sources" of feed into the system so that high demands can be supplied from multiple mains within the system.

- By having more independent mains supplying flow to meet a particular demand, the required flow through any given pipe is lower, and the pressure losses to supply the demand are also lower. This results in a stronger overall system and allows the use of smaller size distribution pipelines. This is especially relevant for an existing system like Steamboat Springs'.

- A lower tank elevation is necessary to achieve the same pressure.

- Greater redundancy/reliability is provided in the event of a main break.

For Steamboat, the recommended storage to meet projected ultimate demands is in the range of 4.5 to 5 million gallons (MG); a recommended additional requirement of approximately 2 MG.

HYDRAULIC MODELING

The City provided an H2ONET model of the existing water system. The City had already assigned water demands at the nodes and had calibrated the model to existing operations. For our evaluation, the existing model was converted to EPANET 2.0. This allowed us to incorporate the existing Mount Werner Water District Model which is also in EPANET 2.0. Computer modeling tasks consisted of updating the existing distribution system by adding proposed piping and demands for the future development.

The City and WSSA water distribution system's performance was evaluated for the following simulations (refer to Buildout Water Model Node Map):

1. Existing pipelines and demands only.

2. Existing demands with high priority recommended improvements.

3. Proposed system at buildout, with buildout demands and recommended improvements.

In addition, system improvements needed to provide adequate service to the west area were evaluated, and modeled, assuming the likely scenario that the recommended Elk River diversion and treatment improvements would be phased; i.e., timing of implementation would lag behind the development. This evaluation included additional system hydraulic modeling without the Elk River improvements but with a booster pump station and West City Tank. For these analyses, a threshold demand of about 20 percent of the ultimate WSSA buildout was assumed. An allowance for permitting and design review must be considered in the timing of the improvements.

Demands on the system were estimated for each simulation based on maximum day, peak hour, and maximum day at build-out conditions. The developed diurnal curve for peaking was used for simulating peak hour stresses on the system. These demands, based on the customer use data, were assigned to the overall system at individual pipe junctions (nodes).

Modeling simulations were completed for extended periods (EPS) to evaluate the system response over a three day period. The EPS modeling stressed the

system and verified operations' experience that it is difficult to move water to the north area of the City.

Modeling results confirmed the inability of the existing water system to provide sufficient supply at adequate pressures to the WSSA solely from the Fish Creek WTP and Yampa Gallery supplies. The modeling also confirmed that the recommended Elk River improvements solved the system deficiencies and ultimate WSSA demands could be reasonably provided. Development of the Elk River supply is triggered by these hydraulic limitations and the improvements are needed at approximately 20 percent WSSA development, or 800 EQR.

With the proposed West City Tank and Booster Pump Station in service, adequate supply and pressures were available to the west area (without full WSSA development), reducing the stress on the existing system and mains, while replenishing both the proposed West City and Steamboat II Tanks.

Model output data for maximum day demand, plus a fire occurring near the airport, is included as Appendix A for reference. Two scenarios are included; 1) City only and 2) with WSSA. The existing and proposed pipe networks, shown on the Buildout Water Model Node Map are bound at the end of this report.

RECOMMENDED IMPROVEMENTS

The Water System Master Plan is illustrated on the enclosed Drawings W1 and W2. Key features are summarized following.

For the City's water system, recommended wholesale improvements should consider two scenarios. The proposed West Steamboat Springs Area (WSSA) annexation would represent, relatively, a very large addition to the utilities' service area. However, the actual growth rates in WSSA – and even the annexation itself – are not firm. Therefore, an analysis of the base service area (the present City Limits) without this major annexation is appropriate. The two scenarios, then, are:

- Service area is present Steamboat Springs corporate limits (not including Mount Werner Water District).

- Service area includes the WSSA (within the Urban Growth Boundaries).

City Only Improvements

Under this scenario, system improvements need to stand alone; i.e., they need to resolve existing system deficiencies and provide reliable service to the west area assuming no development, or supply, west of the City limits. However, good planning dictates that any improvements be designed to integrate with possible future west area developments in an optimum manner, should the WSSA annexation take place in the future. Improvements should also assume the likely scenario that the recommended Elk River diversion and treatment improvements would be phased; i.e., timing of implementation would lag behind the development.

A major finding of the Master Plan is the lack of reliability/redundancy due to both the Fish Creek and Yampa supplies, and all treated storage being located on the southeast side of the City. The need for water storage at a minimum, or new supply, to the west area of the City's system has been identified in numerous studies over the years. The system as it currently stands is a "dead end"; all supplied from the Fish Creek plant and Yampa galleries.

It is recommended that this be remedied by constructing a storage tank east of the airport. Three possible alternative locations have been identified and are shown on Drawing W1. A tank siting study should be completed to determine the preferred location of the tank for land acquisition purposes.

Recommended improvements required to provide adequate fire flows and pressures to the airport area, even if the WSSA annexation does not take place, include:

1. A 1.0 MG West City Tank, located near the airport, with a high water level of approximately 7007 – to serve the Main City Zone. Alternative locations for the West City Tank are illustrated on Master Plan Drawing W1:
   - Alt. 1 is east of the airport runway, above Game Trail Road.
   - Alt. 2 is approximately 1,500 feet north of the cemetery.
   - Alt. 3 is east of Downhill Drive.

2. A Booster Pump Station and PRV located just west of the proposed Overlook Subdivision.

3. An equivalent 12 inch main north of the Yampa River, from about 12th Street (or alternatively near Colorado Mountain College/Alpine Campus) to Indian Trails, to provide redundancy/reliability and improve system hydraulics.

Other recommended City only improvements are:

4. Addition of treated water capacity through expansion of the Yampa Gallery System (or addition of two filter bays to the Fish Creek Water Plant).

5. The City's service boundary includes a neighborhood in the East City High Zone, south of Fish Creek Falls Road, that is currently solely served by the Mount Werner Water District; i.e., there is no direction connection to the City's water system. The City is responsible for the maintenance of the water lines within this neighborhood; however, the only water source is the 250,000 gallon Skyline Tank. The water is pumped directly from the Fish Creek Plant to the Skyline Tank. The transmission main from the tank flows through the District's Skyline Zone and is metered as it passes into the City's service boundary. This area is essentially a dead-end feed, since the only water for the entire zone is supplied by the pump to the tank.

   The addition of a booster station is recommended to provide a redundant source for this zone. The improvements would include a booster pump connection between the 16-inch transmission main (from the Fish Creek WTP clearwell to the Willett Heights tank) and the East City High Zone. Long range planning should include adjusting pressure zone boundaries to incorporate the Alpine Acres and Trouvaille Ct. neighborhoods into the East City High Zone, as illustrated on the Master Drawing.

6. Additional improvements to the system as shown on the Master Plan Drawing should be completed as development dictates or as part of future maintenance or replacements.

7. Implement a radio read water metering system.

WSSA Improvements

The long range plan for serving this area has been developed with consideration of the significant future growth, the City's investment in the Steamboat II tank and the conditional surface water decree for 8 cfs on the Elk River - with the point of diversion at Routt County Road 44. Key components for this plan include:

1. Surface diversion/intake at the decreed point of diversion on the Elk River near County Road 44 – approximate elevation 6670.

2. Raw water pump station with four pumps ultimate (two initially) – approximately 900 gpm each @ 250 feet TDH.

3. Approximately 8,500 feet of raw water transmission main (18 to 20 inch) from the diversion to White Tail Lane.

4. A water treatment plant at CR 44 and White Tail Lane - approx. elevation 6890, sized for an ultimate capacity of 5.0 MGD to fully utilize the conditional water right on the Elk River. Practical filter module sizing would likely result in four filter bays ultimate. Phased construction is recommended with two filters initially (2.5 MGD). The WTP clearwell high water level should be established to match the Steamboat II tank (6886±), establishing the West Valley Low Zone. Recommended clearwell size is approximately 1.5 MG, with approximately 1.0 MG dedicated to the WSSA development and 0.5 MG for chlorine contact time, operational water for backwash and booster pumping. Phased construction for the tank is also recommended for economy and O&M flexibility (cleaning, repairs, etc.).

5. A booster pump station at the WTP (preliminarily sized at 2,000 gpm) will pump treated water to a new West City Tank.

6. Approximately 10,000 l.f. of 12 inch treated water transmission main from the Elk River Treatment Plant to existing 12-inch main near Airport.

7. Distribution mains have been laid out to conform with possible road corridors as presented in the WSSAP 2006 Update.

The above approach has the following advantages:

- The pumping head from the diversion point to the proposed treatment plant is lower than that identified in previous studies, and than an alternative diversion point near County Road 42 that was considered.
- The majority of demand from the WSSA (the West Valley Low Zone) will be served by this gravity connection from the WTP clearwell.
- Only the incremental demands from the Main City Zone will be supplied from the WTP booster pump station.
- The above approaches will result in long term energy savings.
- Needed redundancy for both raw and treated water supplies will be established for the overall City system.
- The planned improvements will result in strong fire flows/supply at the airport and nearby commercial/industrial areas.
- If determined cost effective, raw water could also be supplied to much of the WSSA, following the same pipeline routing as for the West Valley Low Zone main.

PRELIMINARY COST ESTIMATES

An opinion of probable cost for the recommended water system improvements, at a master planning level, is presented following. The improvements have been segregated between those needed to meet ultimate WSSA development demands and City only requirements. Land has been assigned a value of approximately $75,000 per acre (with the exception of the augmentation reservoir), with higher values as appropriate in City. Easements have been assessed at 50 percent of value. It has also been assumed that the majority of water main extensions could be located in public rights-of-way; the amount of easement acquisition reflects this.

	RECOMMENDED CITY IMPROVEMENTS	QUANTITY	ESTIMATED COST
1.	Treated water booster pump station (2,000 gpm) at Elk River WTP.	l.s.	$250,000
2.	Treated water transmission main from Elk River WTP to 12-inch main near Airport.	10,000± l.f.	$2,000,000
3.	1.0 MG West City Tank including 3,000± l.f. 16-inch main.	l.s.	$2,250,000
4.	Booster pump station & PRV (just west of Overlook Subdivision).	l.s.	$400,000
5.	12-inch main - 12TH St. to Indian Trails.	3,000± l.f.	$900,000
6.	Yampa River Gallery System Expansion	l.s.	$1,500,000*****
	Construction Costs.		**$7,300,000**
	Add 25% for contingencies, engineering, inspection, legal and administrative costs.		$1,825,000
	Subtotal - Project Budget		**$9,125,000**

***** City's share of expansion

Estimated costs for land acquisition presented following correspond with the item numbers for the associated improvement above.

	LAND ACQUISITION COSTS	QUANTITY	ESTIMATED COST
2.	Transmission main easement.	0.5 acre	$19,000
3.	West City Tank.	1.5 acres	$113,000
4.	Booster station.	0.5 acre	$100,000
6.	Yampa Gallery System Expansion	3 acres	$125,000*
	Add $20,000 per property for appraisals and legal work.		$70,000
	Subtotal – Land Acquisition		**$427,000**

TOTAL ESTIMATED CITY IMPROVEMENT BUDGET **$9,552,000**

***** City's share of expansion

	RECOMMENDED WSSA IMPROVEMENTS	QUANTITY	ESTIMATED COST
1.	Elk River augmentation reservoir (initial 1,500 acre feet @ $5,000/ac.ft.)	1,500 ac. ft.	$7,500,000
2.	Elk River surface diversion/intake (8 cfs w/ screen).	l.s.	350,000
3.	Raw water pump station at intake.	l.s.	350,000
4.	Raw water transmission main from diversion to Elk River WTP	8,500± l.f.	2,125,000
5.	2.5 MGD Elk River WTP and 1.5 MG clearwell (Phase 1).	l.s.	4,750,000
6.	16-inch transmission main and 8-inch backwash/sanitary sewer from WTP to WSSA.	6,300± l.f.	1,575,000
	Construction Cost:		**$16,650,000**
	Add 25% for contingencies, engineering, inspection and administrative costs.		4,163,000
	Add 10% for permitting (1041) and legal costs of Items 1 and 2.		785,000
	Subtotal - Project Budget		**$21,598,000**

	LAND ACQUISITION COSTS	QUANTITY	ESTIMATED COST
1.	Augmentation reservoir.	100 acres	$5,000,000
2.	Elk River intake & raw water pump station.	1 acre	75,000
4.	Raw water transmission (assumes ~ 1/3 requires 30-foot wide easement).	2 acre	75,000
5.	Water treatment plant.	5 acres	400,000
6.	Water and sewer line easements.	4 acre	150,000
	Land Acquisition		**$5,700,000**
	Add $20,000 per property for appraisals and legal work.		100,000
	Subtotal – Project Budget		**$5,800,000**

TOTAL ESTIMATED WSSA IMPROVEMENT BUDGET $27,398,000

GENERAL

As for the water system, the goal of the Wastewater Master Plan is to present an optimum system design – and provide overview guidance for extension of service for projected ultimate development.

Construction of future trunks, located schematically on the Master Plan Drawing, should be undertaken on a schedule as dictated by development. The trunks have been laid out to provide gravity service, and to utilize existing capacity where applicable. A number of load points showing projected flows are illustrated on the Drawing. The sizes noted on the Drawing for future trunks are to be considered approximate. Actual development would govern required sizing and should be reviewed during the design process.

DESIGN CRITERIA

To facilitate analysis and evaluation of the regional trunk and interceptor sewer facilities, the service area was segregated into basins and sub-basins. Basin boundaries are primarily dictated by existing flow patterns and topography – in order to permit gravity flows whenever possible.

Sewer capacities are a function of pipe size, slope and, to some extent, pipe material and condition. Sewers should be designed to maintain a minimum velocity of 2.0 feet per second (fps), based on a full pipe.

It is generally accepted practice to design new sewers at about 50 percent of pipe capacity (safety factor of 2) for 12-inch and smaller sewers and about 70 percent for larger sewers. For evaluation of existing sewers, judgment is used in applying safety factors; i.e., we would not replace a sewer just because the safety factor was less.

For the Wastewater Treatment Plant, pursuant to Colorado Law, the City is required to initiate engineering and financial planning for expansion when the plant reaches 80 percent of design capacity. Construction shall commence when 95 percent of design capacity is reached.

SEWER SYSTEM MODEL

All of the trunk and sub-trunk sewer reaches were evaluated by comparing estimated flows to actual capacity. Using a computer spreadsheet model, sewer sizes, lengths & manhole elevations were entered, and the line's probable full capacity calculated. Inputs and procedures used in developing the model are described following.

Information Sources. Information used for preparation of the model was obtained using a Utility Map provided by the City. The manholes with incomplete data should be verified by field investigations/surveys.

Maps. The City furnished a composite map of the existing wastewater collection system. The map also provided background street and elevation data.

Flows. Existing customer data, plant wastewater flowrates, and land use information were used to calculate projected flows for future development, and applied to the appropriate sewer reaches in the model. The methodology can be found in Section III of this report.

Pipe Capacities. Existing pipe capacities were calculated using the survey data. Pipe sizes were acquired from as-built drawings and base mapping provided by the City. Conflicts in pipe size between the two sources were resolved with staff. Full pipe capacity was determined using Manning's Equation. A reduction in capacity (to 50% of flow capacity for sizes less than 15-inch and 70% of flow capacity for sizes 15-inch and over) was applied to provide a factor of safety. Ultimate (existing and predicted) flows were used to evaluate the capacity. The Master Plan Drawing, bound at the back of the Report, illustrates a number of projected flow rates with the existing pipe capacities at different locations of the system.

The modeling spreadsheet included in Appendix B depicts peak flows at development build-out, compared to the available pipeline capacities at both 70% and 50% capacity as appropriate. Sewers highlighted in red indicate pipeline capacities that are exceeded at predicted peak-hour flows. Yellow highlighting indicates that projected peak-hour flows exceed the pipeline safety factor, and/or are in areas where significant additional flows are not expected. They should be monitored to verify actual flows prior to replacement and for

possible development/land use changes. The model establishes projected EQRs, design Maximum Day Flow (MGD), Peaking Factor and Instantaneous Peak Flow (including I/I values) for each trunk sewer reach, for both existing and future conditions.

RESULTS

Sewers

Two categories of needed sewer replacements were identified, one illustrating trunk sewers whose capacity was exceed based on existing conditions and one for those undersized for future developments/flows.

Sewers identified for replacement at existing flows are listed in the following Table IV-A.

	Upstream Manhole	Size, inch	Length, ft.	Location
1.	73.31	8	517	Amethyst Dr.
2.	73.36	8	400	Above Fish Creek Falls Rd.
3.	73.19	8	388	3rd and Fish Creek Falls Rd.
4.	Junction Box 3	15	3500	Interceptor
5.	Mt. Werner Trunk	21/24	11,400	Interceptor
6.	50A	24	665	Interceptor
7.	River Crossing	10	1049	Steamboat II River Trunk

Table IV-A –Overloaded Sewers – Existing Conditions

The sewers identified for replacement at ultimate flows are:

	Upstream Manhole	Size, inch	Length, ft.	Location
8.	DB-1	21	2,110	Interceptor
9.	32A.1	15	206	River Crossing at Sleepy Bear

Table IV-B – Overloaded Sewers – Buildout Conditions

RECOMMENDED IMPROVEMENTS

Collection System

The Wastewater System Master Plan is illustrated on the enclosed Drawings S1 and S2. Key features are summarized following.

The interceptor sewer noted in Table IV-B for replacement, Items No. 4 and 8, have already been designed and submitted to the Colorado Department of Health and Environment for review; however, it has not been bid for construction. The City is waiting for the proper funding source to be available. Construction of this estimated $1.85 million sewer has been addressed in the Wastewater Utility Rate Study.

For Item 8, modeling results show this sewer nearing the pipe capacity and overloaded at buildout; however, it is not critical at this time. Approximately 2,100 l.f., from the Diversion Box 1 exceeds 70 percent of capacity. It is recommended that the remainder of this section of interceptor be monitored as growth occurs.

The 10-inch sewer, including the Yampa River crossing, (Item No. 7) from Steamboat II to the lift station located at the treatment plant is essentially at capacity, or surcharged, during peak wet weather flows – based on lift station pumping records. It is possible that this sewer can be surcharged without negative consequences or that sources of excessive I/I could be identified and corrected. Monitoring should be conducted to verify.

The 18”/21” sewer that conveys the flows from the Mount Werner Water District to the City (Item No. 5) system is approximately two miles long and runs along

the Yampa River through the center of the City. It is known by City and District staff to be very flat and approaching capacity with some sections already exceeding capacity. It is anticipated that growth within the District will quickly force the sewer overloaded and is expected for replacement. However, the river crossing at 11th Street does have capacity.

The other sections of sewer noted, Items 1 through 3, are local which do not provide sufficient capacity at the given slope. It is recommended that actual constructed slopes, and possibility of surcharge, be verified by field studies prior to final design.

Steamboat II Lift Station

As noted previously, the existing Steamboat II Lift Station is currently near or at capacity. A new replacement lift station and force main will be needed to meet planned WSSA growth. The new station should include a sewage grinder. Because of the depth of the existing station, during preliminary design, it is recommended that a siting study be completed to evaluate the potential for location on the north side of the Yampa River. It is likely that the new station could be considerably shallower.

Infiltration/Inflow Correction

Most of the infiltration is known to exist in the neighborhoods with the oldest sewers. The City has begun the task of identifying and correcting any and all non-domestic sewage discharges to the system and has imposed a schedule of maintenance and repair for the most critical areas. This has already resulted in a reduction in I/I.

It is recommended that the City continue to fund an aggressive I/I reduction program, including flow monitoring, video inspections and smoke testing. The potential capital savings in treatment plant and interceptor sewer improvements and reduced O & M costs are significant. Replacement of major capital improvements could be deferred or eliminated with I/I correction.

Treatment Facilities

Recommended improvements for the wastewater treatment facilities have been segregated into three categories. First, improvements identified as needed in the near future (within approximately five years) to maintain treatment and operations reliability or improve efficiency. Second are ongoing maintenance

improvements to be completed within the next ten plus years. These include needed equipment repairs and replacements, some which have been postponed for budget reasons. The third category includes needed plant capacity expansion if the WSSA development materializes. A site plan illustrating the proposed plant expansion is included as Drawing IV-A.

As described in Section IIIS, existing wastewater treatment capacity is 5.0/7.5 MGD (Dry/Wet Weather). At maximum monthly flows of 2.6/4.8 MGD, the plant is at approximately 60 percent capacity. Planning for expansion must be initiated at 80 percent of treatment capacity, representing approximately 16,600 EQR.

DRAWING IV-A

Near Future Wastewater Treatment Plant Improvements

Near future improvements include upgrades needed to maintain reliable treatment or improve efficiency. These improvements are:

- Replacement of the mechanical bar screens. This has already been planned and budgeted for; final design/selection should ensure sizing to handle a minimum hydraulic loading of 15 MGD.

- Second aerobic digester to match existing, including centrifugal blower, aeration diffusers, centrifuge feed pump w/ grinder, and ancillary equipment.

- Replace ceramic aeration diffusers in the west Aeration Basins No. 1 and 2 with flexible membrane fine bubble diffusers.

- Construct baffle walls to create multiple aeration zones in the basins, providing potential for development of an anoxic zone for denitrification (and possibly phosphorous removal). The creation of zones will also provide for greater operational flexibility, minimize short circuiting (and, therefore, ammonia bleed through), and approximate plug flow - resulting in better performance. This will also provide aeration energy savings and reduce the need for alkalinity addition.

- Repairs/repaint mechanisms skimmer, sludge rake mechanisms for Clarifier No. 1.

- Add UV modules to increase disinfection effectiveness/reliability.

- SCADA upgrades to include data/flow indicating and recording

Ongoing Maintenance Improvements

Key components of repairs and replacements to the original secondary plant include (these could be completed in two phases; i.e., upgrade Aeration Basin and Clarifier No. 1 (above), followed by No. 2):

- Complete diffuser replacement and clarifier painting for train No. 2.

- Replace existing WAS and RAS pumps with VFD's.

- Rehab polishing pond liner.

- Decommission old lagoon treatment plant.

Capacity Expansion

If WSSA development does proceed and I/I is not significantly reduced, improvements needed to meet projected flows include:

- Add new secondary treatment train (one aeration basin and clariflocculator).

- Add third digester and associated aeration equipment.

- Increase UV capacity through addition of third, parallel train.

- Miscellaneous hydraulic improvements throughout liquid conveyance.

- Additional administration, office, lunch room facilities.

- Extend potable water service to the WWTF, following the alignment of the Steamboat II trunk sewer.

PRELIMINARY COST ESTIMATE

A summary of estimated costs for the recommended improvements is presented following. For operational, and budgeting, purposes it is recommended the upgrades to the west aeration basins and clarifiers be phased.

Table IV-C – COLLECTION SYSTEM ESTIMATED BUDGETS

CITY - NEAR TERM IMPROVEMENTS:	ESTIMATED COST
Interceptor Replacement – JB3 to DB2, 3,700 lf	$1,850,000
Mount Werner Trunk – Meter to MH 74, 11,400 l.f.	$5,392,000
Amethyst Dr. – Manhole 73.31, 517 lf	$140,000
Above Fish Creek Falls Rd. – Manhole 73.36, 400 lf	$110,000
3rd Street – Manhole 73.19, 377 l.f.	$110,000
Interceptor from DB-C to MH50, 30", 665 l.f.	$332,000
Steamboat II River Crossing, 969 lf	$615,000
TOTAL ESTIMATED CONSTRUCTION COST:	**$8,549,000**
25% construction contingencies, engineering, legal and administrative costs	$2,137,000
TOTAL ESTIMATED BUDGET	**$10,686,000**

WSSA DEVELOPMENT IMPROVEMENTS:	ESTIMATED COST
River Crossing at Sleepy Bear, 300 lf	$300,000
TOTAL ESTIMATED CONSTRUCTION COST:	**$300,000**
25 % construction contingencies, engineering, legal and administrative costs	$75,000
TOTAL BUDGET	**$375,000**

Table IV-D – WASTEWATER TREATMENT PLANT ESTIMATED BUDGETS

CITY - NEAR TERM IMPROVEMENTS	ESTIMATED COST
Replace mechanical bar screens	$400,000
2nd Aerobic Digester	$1,600,000
Aeration Basin No. 1 diffuser replacement, baffle wall additions, Clarifier No. 1 repainting and RAS/WAS pumps replacement	$450,000
Additional UV modules	$100,000
Repair/reline polishing pond	$275,000
Lagoon decommissioning	$350,000
TOTAL ESTIMATED CONSTRUCTION COST	**$3,175,000**
25 percent construction contingencies, engineering, legal and administrative costs	$795,000
TOTAL ESTIMATED BUDGET	**$3,970,000**

FUTURE (ONGOING) REPLACEMENTS	ESTIMATED COST
Aeration Basin No. 2 diffuser replacement, baffle wall additions, Clarifier No. 2 repainting and RAS/WAS pumps replacement	$450,000
Miscellaneous plant piping, slide gates, Cl_2 spray, mechanical, electrical repairs/replacement, and painting	$500,000
TOTAL ESTIMATED CONSTRUCTION COST	**$950,000**
25 percent construction contingencies, engineering, legal and administrative costs	$238,000
TOTAL ESTIMATED BUDGET	**$1,188,000**

WSSA - CAPACITY EXPANSION	ESTIMATED COST
Add new secondary treatment train	$2,500,000
Addition of 3rd digester	$1,600,000
Increase UV capacity	$250,000
Additional administration, office lunch room facilities	$350,000
Steamboat II lift Station replacement and force main	$670,000
TOTAL ESTIMATED CONSTRUCTION COST	**$5,370,000**
25 percent construction contingencies, engineering, legal and administrative costs	$1,343,000
TOTAL ESTIMATED BUDGET	**$6,713,000**

SECTION V
CONCLUSIONS/RECOMMENDATIONS

Based on evaluation of the existing systems and future growth projections, together with the results of the computer network analyses, the following conclusions and recommendations regarding Master Planning for the City's water and wastewater systems were reached. Long range planning is a continuing process since development never occurs at the exact location, pace, or densities predicted. Comprehensive preliminary planning/predesign should, therefore, take place before significant investments in new wholesale facilities.

Construction of future water and sewer mains, located schematically on the Master Plan Drawings, should be undertaken on a schedule as dictated by development. The utilities have been laid out to accommodate probable roadway corridors or provide gravity service, and to utilize existing facilities where applicable, but should be considered schematic. The sizes noted on the Drawings for future mains represent equivalent sizing and are to be considered approximate. Actual development will govern final routing and required sizing and should be reviewed during the predesign process.

The single source of treated water supply from the Fish Creek/Yampa supply systems represents a significant shortcoming, leaving the west City area vulnerable in the event of an emergency main break, required maintenance/replacement, and forest fire in the water shed. In addition, delivery to the west City area is substandard; fire flows are inadequate.

Following are priority improvement recommendations:

WATER

1. Recommended total treated water storage at buildout is estimated at approximately 4.5 to 5 MG. Because of system deficiencies noted above, new storage should be sited in the west City area. Preliminary engineering, including a tank siting study, should be initiated to determine the exact location for land acquisition purposes.

2. A booster pump station (possibly interim) and PRV will be required to provide sufficient flows/pressures and to replenish the proposed West

City Tank under peak demand conditions if annexation doesn't occur or the Elk River supply is delayed.

3. The City should continue to develop the Elk River conditional water right; it is a good physical supply of high quality and represents an excellent long term asset. This is a key component of the water supply if the WSSA annexation proceeds.

Further evaluation, including a siting study, should be completed to finalize size and timing for the Elk augmentation reservoir, together with pursuing opportunities for obtaining usable storage from existing reservoirs.

4. The City should develop an integrated water model which includes the Mount Werner Water District system. This would provide a more accurate representation of system dynamics.

WASTEWATER

1. A continuing, aggressive infiltration and inflow reduction program is needed, to include flow monitoring, smoke testing, and physical and video inspection of sewer mains and service connections. Any investigation should include the Steamboat II system. The potential capital savings through eliminating, or deferring, treatment plant and interceptor sewer expansions, and the associated reductions in O & M costs are significant.

2. Replace trunk sewers/interceptors identified as overloaded at existing peak flows (some already planned for replacement).

3. Replacement of the mechanical bar screen and construction of the second aerobic digester should proceed (already planned).

4. Rehabilitate one of the west secondary treatment trains, including aeration diffuser replacement, baffle wall construction (with consideration of implementing denitrification), clarifier rehabilitation and pump replacements.

APPENDIX A

SCENARIO 1

Water Model Results

Maximum day flows plus 3500 gpm fire flow near the airport. City service area demands only with the proposed West City Tank and booster pump station.

APPENDIX A

SCENARIO 2

Water Model Results

Maximum day flows plus 3500 gpm fire flow near the airport. City service area demands plus WSSA development with West City Tank and Elk River Water Treatment Plant.

APPENDIX B

Wastewater Model Spreadsheet

SCENARIO 1 - CITY ONLY

Network Table - Nodes at 14:00 Hrs

Node ID	Demand GPM	Pressure psi
Junc 1	0.00	13.66
Junc 10	2.69	94.39
Junc 100	1.82	106.84
Junc 1001	1.82	120.03
Junc 1003	1.82	100.97
Junc 1005	1.82	120.71
Junc 1007	1.82	87.97
Junc 1009	2.69	12.05
Junc 101	2.69	78.80
Junc 1011	2.69	6.97
Junc 1013	3.52	106.55
Junc 1015	3.52	101.69
Junc 1017	1.82	109.13
Junc 1019	1.82	107.84
Junc 102	3.68	76.46
Junc 1021	1.82	108.67
Junc 1023	1.82	108.67
Junc 1024	1.82	105.51
Junc 1025	1.82	112.00
Junc 1026	1.82	109.32
Junc 1027	1.82	112.85
Junc 1029	1.82	114.14
Junc 103	2.69	91.79
Junc 1031	1.82	112.34
Junc 1033	1.82	112.52
Junc 1035	1.82	110.42
Junc 1037	1.82	112.85
Junc 1039	1.82	113.72
Junc 104	3.67	69.82
Junc 1041	1.82	106.70

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 1043	1.82	105.84
Junc 1045	1.82	110.60
Junc 1047	1.82	105.40
Junc 1049	1.82	105.40
Junc 105	2.69	108.26
Junc 1051	1.82	105.40
Junc 1053	1.82	105.20
Junc 1055	1.82	105.20
Junc 1057	1.82	104.05
Junc 1059	1.82	103.23
Junc 106	3.68	72.36
Junc 1061	1.82	99.97
Junc 1063	1.82	99.97
Junc 1065	1.82	95.93
Junc 1067	1.82	97.62
Junc 1069	1.82	86.41
Junc 107	2.69	78.80
Junc 1071	1.82	84.28
Junc 1073	1.82	84.37
Junc 1075	1.82	84.28
Junc 1077	1.82	84.29
Junc 1079	1.82	85.65
Junc 108	3.67	81.95
Junc 1081	1.82	83.99
Junc 1083	1.82	83.12
Junc 1085	1.82	104.12
Junc 1087	1.82	107.28
Junc 1089	1.82	112.05
Junc 109	2.69	79.66
Junc 1091	1.82	113.79
Junc 1093	1.82	109.73

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 1095	1.82	113.54
Junc 1097	1.82	117.62
Junc 1099	1.82	107.43
Junc 11	1.84	7.01
Junc 110	2.69	87.45
Junc 1101	1.82	107.60
Junc 1103	1.82	108.02
Junc 1105	1.82	112.30
Junc 1107	1.82	52.41
Junc 1109	1.82	58.27
Junc 111	2.69	83.13
Junc 1111	1.82	53.28
Junc 1113	1.82	54.93
Junc 1115	1.82	57.52
Junc 1117	1.82	56.19
Junc 1119	1.82	55.75
Junc 112	2.69	89.84
Junc 1121	1.82	55.71
Junc 1123	1.82	58.29
Junc 1125	1.82	59.16
Junc 1127	1.82	59.13
Junc 1129	1.82	59.05
Junc 113	1.84	106.71
Junc 1131	1.82	59.05
Junc 1133	1.82	58.24
Junc 1135	1.82	57.42
Junc 1137	1.82	58.27
Junc 1139	1.82	59.01
Junc 114	1.82	93.41
Junc 1141	1.82	58.97
Junc 1143	1.82	101.71

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 1145	1.82	84.50
Junc 1147	1.82	81.90
Junc 1149	1.82	80.60
Junc 115	1.84	104.11
Junc 1151	1.82	78.44
Junc 1153	1.82	74.11
Junc 1155	1.82	68.92
Junc 1157	1.82	65.90
Junc 1159	1.82	62.36
Junc 116	1.82	83.44
Junc 1161	1.82	61.93
Junc 1163	1.82	66.27
Junc 1165	1.82	71.48
Junc 1167	1.82	75.39
Junc 1169	1.82	76.89
Junc 117	1.84	124.04
Junc 1171	1.82	75.59
Junc 1173	1.82	76.20
Junc 1175	1.82	78.18
Junc 1177	1.82	82.43
Junc 1179	1.82	82.35
Junc 118	1.82	75.64
Junc 1181	1.82	84.04
Junc 1183	1.82	80.56
Junc 1185	1.82	77.96
Junc 1187	1.82	68.40
Junc 1188	1.82	64.07
Junc 1189	1.82	77.39
Junc 119	1.84	86.86
Junc 1191	1.82	78.26
Junc 1193	1.82	75.22

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 1195	1.82	72.32
Junc 1197	1.82	66.62
Junc 1199	1.82	57.52
Junc 12	2.69	82.97
Junc 120	1.82	73.06
Junc 1201	1.82	46.81
Junc 1203	5600.00	26.28
Junc 1207	1.82	25.14
Junc 1209	1.82	87.53
Junc 1211	1.82	81.90
Junc 1213	1.82	79.73
Junc 1215	1.82	77.57
Junc 1217	1.82	83.20
Junc 1219	1.82	85.37
Junc 122	1.82	73.01
Junc 1221	1.82	59.08
Junc 1223	1.82	59.87
Junc 1225	1.82	58.93
Junc 1227	1.82	58.92
Junc 1229	1.82	61.11
Junc 123	2.69	48.59
Junc 1231	2.69	92.66
Junc 1233	2.69	83.99
Junc 1235	2.69	79.94
Junc 1237	2.69	71.19
Junc 1238	2.69	66.85
Junc 1239	2.69	65.40
Junc 124	1.82	74.72
Junc 1243	2.69	74.05
Junc 1245	2.69	71.45
Junc 1247	2.69	69.72

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 1249	2.69	80.12
Junc 125	2.69	48.54
Junc 1251	2.69	82.71
Junc 1253	2.69	96.58
Junc 1255	2.69	103.51
Junc 1257	2.69	106.11
Junc 1259	2.69	94.84
Junc 126	1.82	74.71
Junc 1263	2.69	92.24
Junc 1265	2.69	80.10
Junc 1267	2.69	83.58
Junc 1269	1.82	71.27
Junc 1271	1.82	71.27
Junc 1273	1.82	73.85
Junc 1275	3.81	126.82
Junc 1276	3.81	120.98
Junc 1277	3.81	120.97
Junc 1279	3.81	120.71
Junc 128	1.82	70.43
Junc 1281	2.69	150.15
Junc 1285	2.69	150.11
Junc 1287	1.82	25.44
Junc 1289	1.82	29.35
Junc 129	2.69	48.54
Junc 1291	1.82	31.51
Junc 1293	1.82	31.51
Junc 1295	1.82	31.51
Junc 1297	1.82	29.35
Junc 1299	1.82	32.43
Junc 13	2.69	14.26
Junc 130	1.82	73.04

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 1301	1.82	38.32
Junc 1303	3.46	61.64
Junc 1311	3.46	74.64
Junc 1313	3.46	66.84
Junc 1315	3.46	59.90
Junc 1317	3.46	51.24
Junc 1318	2.67	109.03
Junc 1319	1.82	115.90
Junc 132	1.82	75.64
Junc 1320	0.00	109.09
Junc 1321	1.82	117.15
Junc 1323	1.82	117.34
Junc 1324	3.46	46.91
Junc 1325	2.69	109.13
Junc 1326	3.46	44.31
Junc 1327	2.69	113.42
Junc 1329	2.69	117.73
Junc 133	2.69	40.74
Junc 1331	2.69	128.97
Junc 1333	2.69	124.62
Junc 1335	2.69	130.65
Junc 1337	2.69	141.88
Junc 1339	2.69	143.18
Junc 134	1.82	73.07
Junc 1340	1.82	69.12
Junc 1341	2.69	138.85
Junc 1345	2.69	4.69
Junc 1347	2.69	6.86
Junc 1349	4.26	112.27
Junc 135	2.69	32.94
Junc 1351	4.26	116.61

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 1353	4.26	117.47
Junc 1355	4.26	107.94
Junc 1357	1.84	102.70
Junc 1358	1.84	102.27
Junc 1359	4.26	112.27
Junc 136	1.82	73.02
Junc 1360	1.84	106.60
Junc 1363	1.84	108.77
Junc 1365	1.84	110.50
Junc 137	2.69	55.39
Junc 1373	2.69	123.22
Junc 1375	2.69	134.48
Junc 1377	1.82	96.04
Junc 1379	1.82	89.09
Junc 138	1.82	70.44
Junc 1381	1.82	78.23
Junc 1383	1.82	77.89
Junc 1385	1.82	79.21
Junc 1387	1.82	79.43
Junc 139	2.69	57.10
Junc 1397	1.82	62.41
Junc 1399	1.82	69.10
Junc 14	2.69	76.04
Junc 140	1.82	70.42
Junc 1400	1.82	74.98
Junc 1401	1.82	75.81
Junc 1402	1.82	74.11
Junc 1403	1.82	76.92
Junc 1405	1.82	80.87
Junc 1407	1.82	80.73
Junc 1409	1.82	89.08

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 141	2.69	43.11
Junc 1411	48.00	7.25
Junc 1413	112.00	-25.31
Junc 1415	80.00	8.04
Junc 1417	0.00	-28.79
Junc 1418	0.00	-20.99
Junc 1419	0.00	-11.46
Junc 142	1.84	74.18
Junc 1421	32.00	-5.39
Junc 143	2.69	43.04
Junc 144	1.84	62.96
Junc 145	2.69	49.04
Junc 146	1.84	63.82
Junc 147	2.69	64.53
Junc 148	1.84	43.44
Junc 149	2.69	65.37
Junc 15	2.69	-16.26
Junc 150	1.84	62.06
Junc 151	2.69	68.84
Junc 152	1.84	68.60
Junc 1520	1.82	71.30
Junc 1521	1.82	60.06
Junc 1522	1.82	49.23
Junc 1523	1.82	50.26
Junc 1526	1.82	58.08
Junc 1527	1.82	60.72
Junc 1528	1.82	52.92
Junc 153	2.69	76.57
Junc 1530	1.84	86.45
Junc 1531	0.00	88.61
Junc 1532	1.84	89.91

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 1533	1.82	67.39
Junc 154	2.67	66.87
Junc 155	2.69	101.61
Junc 156	1.84	89.86
Junc 157	2.69	101.55
Junc 158	1.84	77.31
Junc 159	2.69	108.48
Junc 16	2.69	81.24
Junc 160	1.84	74.70
Junc 1600	1.84	44.13
Junc 1602	1.84	51.49
Junc 1604	1.84	48.46
Junc 1606	1.84	44.99
Junc 1608	1.84	43.26
Junc 161	2.69	101.11
Junc 162	1.84	80.38
Junc 163	2.69	96.41
Junc 165	2.69	80.57
Junc 166	1.84	137.12
Junc 167	2.69	66.05
Junc 168	1.84	41.31
Junc 169	2.69	123.10
Junc 17	2.69	-3.50
Junc 170	1.84	150.33
Junc 171	2.69	114.76
Junc 172	1.84	118.44
Junc 174	1.84	118.44
Junc 175	2.69	34.67
Junc 176	1.84	115.74
Junc 177	2.69	34.67
Junc 178	1.84	110.04

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 179	2.69	19.50
Junc 18	2.69	88.17
Junc 183	1.84	79.66
Junc 184	1.82	75.37
Junc 185	1.84	81.39
Junc 186	1.82	107.20
Junc 187	1.84	58.86
Junc 188	1.82	102.83
Junc 189	1.84	55.39
Junc 19	2.69	-1.87
Junc 190	1.82	70.33
Junc 191	1.84	44.56
Junc 192	3.52	88.45
Junc 193	1.84	37.19
Junc 194	0.00	77.23
Junc 196	0.00	74.63
Junc 197	1.84	141.37
Junc 198	0.00	102.74
Junc 199	1.84	143.11
Junc 2	0.00	12.77
Junc 20	1.82	94.03
Junc 200	1.84	75.50
Junc 201	1.84	160.44
Junc 203	1.84	59.73
Junc 205	1.84	52.79
Junc 207	1.84	71.29
Junc 208	1.84	80.39
Junc 209	1.84	71.29
Junc 21	2.69	56.81
Junc 210	1.84	110.04
Junc 215	1.84	55.40

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 216	1.82	60.24
Junc 217	1.84	41.53
Junc 218	1.82	55.04
Junc 219	1.84	39.80
Junc 22	1.82	93.60
Junc 227	2.69	136.68
Junc 229	2.69	137.55
Junc 23	2.69	65.41
Junc 231	2.69	144.05
Junc 235	2.69	148.81
Junc 237	2.69	151.41
Junc 239	2.69	150.55
Junc 24	1.82	88.83
Junc 241	2.69	146.22
Junc 242	2.69	145.78
Junc 243	2.69	144.92
Junc 244	2.69	141.88
Junc 245	2.69	144.92
Junc 246	2.69	134.52
Junc 247	2.69	144.92
Junc 248	2.69	131.92
Junc 249	2.69	132.78
Junc 25	2.69	74.92
Junc 250	2.69	135.82
Junc 251	2.69	128.89
Junc 252	2.69	136.68
Junc 253	2.69	118.49
Junc 255	2.69	110.69
Junc 257	2.69	105.50
Junc 259	2.69	110.70
Junc 26	1.82	84.07

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 261	2.69	116.76
Junc 263	2.69	95.97
Junc 264	2.69	89.05
Junc 265	2.69	95.11
Junc 267	2.69	123.69
Junc 268	2.69	125.42
Junc 269	2.69	125.42
Junc 27	1.84	89.59
Junc 270	2.69	130.62
Junc 271	1.84	51.06
Junc 272	2.69	116.77
Junc 273	1.84	44.13
Junc 275	2.69	149.25
Junc 277	2.69	52.78
Junc 279	2.69	52.78
Junc 28	1.82	91.00
Junc 281	2.69	49.64
Junc 283	2.69	49.64
Junc 285	1.84	115.27
Junc 287	2.69	57.77
Junc 289	2.69	57.91
Junc 29	1.84	85.19
Junc 291	2.69	51.90
Junc 293	2.69	50.33
Junc 295	2.69	47.34
Junc 297	2.69	151.37
Junc 299	2.69	146.04
Junc 3	0.00	12.89
Junc 30	1.84	95.11
Junc 301	2.69	140.25
Junc 302	2.69	146.75

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 303	2.69	137.57
Junc 304	2.69	132.37
Junc 305	2.69	138.44
Junc 307	2.69	142.77
Junc 309	2.69	126.28
Junc 31	1.84	111.98
Junc 311	2.69	129.75
Junc 313	2.69	125.44
Junc 315	3.67	87.65
Junc 317	3.67	85.48
Junc 319	3.68	82.88
Junc 321	3.68	72.05
Junc 323	3.67	74.22
Junc 325	3.68	80.28
Junc 327	3.68	74.22
Junc 329	3.68	67.72
Junc 33	1.84	130.99
Junc 331	3.67	73.35
Junc 333	3.67	80.72
Junc 335	3.67	87.40
Junc 337	3.67	84.95
Junc 339	3.67	85.67
Junc 341	3.67	90.00
Junc 343	3.67	85.10
Junc 345	3.67	88.57
Junc 347	3.68	84.36
Junc 348	0.00	80.16
Junc 349	3.67	76.04
Junc 35	1.84	130.12
Junc 351	2.69	31.90
Junc 357	3.68	74.22

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 359	3.68	69.88
Junc 361	3.67	78.36
Junc 363	3.67	71.42
Junc 365	3.67	64.50
Junc 367	3.68	61.47
Junc 369	3.67	73.77
Junc 37	1.84	132.71
Junc 371	3.68	72.04
Junc 373	3.67	92.62
Junc 375	3.52	99.24
Junc 377	3.52	99.15
Junc 379	3.67	62.34
Junc 381	3.67	60.17
Junc 383	3.68	47.17
Junc 385	3.68	47.17
Junc 387	3.67	56.70
Junc 389	3.68	54.97
Junc 39	1.84	142.68
Junc 391	3.67	68.02
Junc 393	3.67	59.36
Junc 395	3.67	52.42
Junc 397	3.52	99.13
Junc 399	3.52	97.65
Junc 4	0.00	2.96
Junc 401	3.52	86.33
Junc 403	3.52	88.45
Junc 405	3.52	86.32
Junc 407	3.52	100.92
Junc 409	3.52	91.39
Junc 41	1.84	131.84
Junc 413	3.67	72.38

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 415	3.68	61.11
Junc 417	3.52	82.58
Junc 419	3.52	102.40
Junc 421	3.52	102.83
Junc 427	3.52	99.22
Junc 429	3.52	104.44
Junc 43	1.84	137.04
Junc 430	1.84	99.68
Junc 431	7.55	89.71
Junc 433	7.55	103.58
Junc 437	3.52	105.24
Junc 441	3.52	68.02
Junc 443	3.52	55.02
Junc 445	3.52	65.42
Junc 447	3.52	52.42
Junc 449	3.52	53.29
Junc 45	1.84	130.98
Junc 451	3.68	75.33
Junc 453	3.68	71.43
Junc 454	3.68	71.00
Junc 455	3.68	69.27
Junc 456	3.68	69.27
Junc 457	2.69	49.35
Junc 458	3.68	72.30
Junc 459	2.69	41.82
Junc 460	1.84	69.70
Junc 461	2.69	36.69
Junc 463	2.69	16.82
Junc 467	2.69	40.16
Junc 469	3.46	80.20
Junc 47	1.84	122.31

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 471	3.46	74.13
Junc 473	3.46	70.66
Junc 475	3.46	65.46
Junc 477	3.46	56.36
Junc 479	3.46	48.99
Junc 481	3.46	41.20
Junc 483	3.46	49.86
Junc 485	3.46	58.53
Junc 487	3.46	83.66
Junc 489	3.46	77.04
Junc 49	1.84	130.12
Junc 491	3.46	77.35
Junc 493	3.46	42.15
Junc 495	3.46	42.58
Junc 497	3.46	58.18
Junc 499	3.46	60.78
Junc 5	2.69	10.63
Junc 50	1.84	64.49
Junc 501	3.46	71.21
Junc 503	3.46	83.36
Junc 505	3.46	92.90
Junc 507	3.46	77.69
Junc 509	3.46	97.25
Junc 51	1.84	130.11
Junc 511	3.46	50.38
Junc 513	3.46	78.13
Junc 515	3.46	97.50
Junc 517	3.46	97.51
Junc 519	3.46	97.53
Junc 52	1.84	74.02
Junc 521	3.46	94.37

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 523	3.46	97.28
Junc 525	7.55	112.44
Junc 527	3.52	103.75
Junc 529	7.55	109.92
Junc 53	1.84	82.60
Junc 531	3.52	105.85
Junc 533	3.52	101.63
Junc 535	3.52	101.63
Junc 537	3.52	101.67
Junc 539	3.52	98.21
Junc 54	0.00	64.06
Junc 540	7.55	104.99
Junc 541	3.52	108.86
Junc 542	3.52	108.73
Junc 543	7.55	114.35
Junc 545	3.46	108.85
Junc 547	3.46	102.71
Junc 549	3.46	102.58
Junc 551	3.46	119.34
Junc 553	7.55	119.44
Junc 555	7.55	119.48
Junc 557	7.55	115.69
Junc 559	7.55	117.45
Junc 56	0.00	67.09
Junc 561	3.80	117.88
Junc 563	3.80	120.59
Junc 565	3.80	124.12
Junc 567	3.46	103.47
Junc 569	3.80	121.09
Junc 571	3.80	123.76
Junc 573	3.80	123.26

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 575	3.81	123.22
Junc 577	7.55	115.42
Junc 579	3.46	84.19
Junc 58	1.84	56.69
Junc 581	3.46	79.87
Junc 583	3.46	97.21
Junc 585	3.46	94.71
Junc 587	3.46	101.75
Junc 589	3.46	101.76
Junc 59	2.69	54.73
Junc 591	3.46	102.62
Junc 593	3.46	100.02
Junc 595	3.46	102.62
Junc 597	3.46	95.98
Junc 599	3.52	103.60
Junc 6	2.69	13.46
Junc 60	1.84	51.49
Junc 601	3.52	110.06
Junc 603	7.55	113.97
Junc 605	3.52	107.84
Junc 607	7.55	109.85
Junc 609	3.52	107.23
Junc 611	3.52	106.58
Junc 615	3.52	108.90
Junc 617	7.55	110.37
Junc 619	7.55	112.95
Junc 62	1.84	53.23
Junc 621	7.55	112.95
Junc 623	7.55	108.98
Junc 625	7.55	113.77
Junc 627	3.80	123.28

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 629	3.80	123.28
Junc 63	2.69	48.32
Junc 631	3.81	124.19
Junc 633	3.80	129.88
Junc 635	3.81	124.04
Junc 637	3.81	124.91
Junc 639	3.81	122.16
Junc 64	1.84	52.58
Junc 641	3.80	122.25
Junc 643	3.81	123.11
Junc 645	3.81	128.31
Junc 647	3.80	128.75
Junc 649	3.81	121.61
Junc 65	2.69	48.32
Junc 651	3.80	121.73
Junc 653	3.81	126.03
Junc 655	3.81	128.17
Junc 656	3.81	128.40
Junc 657	3.80	120.04
Junc 659	3.81	120.48
Junc 66	1.84	85.30
Junc 661	3.81	127.84
Junc 663	3.80	120.58
Junc 667	3.80	120.64
Junc 669	3.81	120.04
Junc 67	2.69	55.66
Junc 671	3.81	120.07
Junc 673	3.81	120.12
Junc 674	3.81	120.08
Junc 675	3.81	128.31
Junc 677	3.81	128.31

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 679	3.81	126.11
Junc 68	1.84	80.96
Junc 680	3.81	125.44
Junc 681	3.81	120.97
Junc 683	3.80	118.35
Junc 685	3.67	114.23
Junc 687	3.67	100.42
Junc 689	3.67	89.97
Junc 69	2.69	57.33
Junc 691	3.68	89.97
Junc 693	3.68	102.07
Junc 695	3.68	104.22
Junc 697	3.80	91.22
Junc 699	3.81	111.68
Junc 7	2.69	19.68
Junc 70	1.84	65.15
Junc 701	3.67	109.25
Junc 703	3.67	117.09
Junc 7049	0.00	3041.35
Junc 705	3.81	118.82
Junc 707	3.80	108.30
Junc 709	3.80	120.92
Junc 71	2.69	57.32
Junc 711	1.84	132.25
Junc 713	1.84	131.57
Junc 715	1.84	131.57
Junc 717	1.84	130.70
Junc 719	1.84	128.69
Junc 72	1.84	81.18
Junc 721	3.80	120.19
Junc 723	3.80	118.40

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 725	3.81	118.40
Junc 727	3.81	120.05
Junc 729	1.84	130.82
Junc 73	2.69	49.37
Junc 731	3.80	113.63
Junc 733	3.67	110.98
Junc 735	3.67	98.97
Junc 737	3.67	88.09
Junc 739	3.67	102.71
Junc 74	1.84	75.77
Junc 741	7.55	116.40
Junc 743	3.80	116.17
Junc 745	7.55	117.01
Junc 747	3.81	116.89
Junc 749	7.55	112.65
Junc 75	2.69	70.32
Junc 751	7.55	114.38
Junc 753	7.55	114.20
Junc 754	1.84	115.56
Junc 755	1.84	119.67
Junc 756	1.84	97.80
Junc 757	1.84	105.92
Junc 759	1.84	128.54
Junc 76	1.84	80.97
Junc 761	1.84	128.32
Junc 763	1.84	128.86
Junc 765	1.84	128.33
Junc 767	1.84	126.65
Junc 768	1.84	128.10
Junc 769	1.84	125.89
Junc 77	2.69	70.21

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 771	1.84	124.74
Junc 773	1.84	124.85
Junc 775	1.84	124.42
Junc 777	1.84	123.98
Junc 779	1.84	120.26
Junc 78	1.84	43.26
Junc 781	1.84	123.31
Junc 783	1.84	118.90
Junc 785	1.84	119.39
Junc 787	1.84	121.12
Junc 789	1.84	118.38
Junc 79	2.69	65.88
Junc 790	0.00	96.18
Junc 791	1.84	114.01
Junc 793	3.46	97.19
Junc 795	3.46	98.92
Junc 797	3.46	102.06
Junc 799	3.46	102.54
Junc 8	2.69	9.86
Junc 80	1.84	145.35
Junc 801	3.46	102.38
Junc 803	3.46	61.64
Junc 805	3.46	62.51
Junc 807	3.46	57.30
Junc 809	3.46	62.16
Junc 81	2.69	70.17
Junc 811	3.80	73.91
Junc 813	3.80	125.73
Junc 815	3.80	125.44
Junc 817	3.46	105.49
Junc 819	3.46	43.44

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 82	1.84	141.45
Junc 821	3.81	126.69
Junc 823	3.81	126.69
Junc 825	3.80	126.33
Junc 827	3.80	126.56
Junc 829	3.81	125.26
Junc 83	2.69	84.99
Junc 831	3.81	126.75
Junc 833	3.80	128.44
Junc 835	3.80	130.17
Junc 837	3.80	124.33
Junc 839	3.81	121.56
Junc 84	1.84	147.08
Junc 841	3.80	121.12
Junc 843	3.80	125.71
Junc 845	3.81	124.83
Junc 847	3.80	124.83
Junc 849	3.80	126.57
Junc 85	2.69	92.94
Junc 851	3.81	124.60
Junc 853	3.81	129.40
Junc 855	3.80	129.50
Junc 857	0.00	122.26
Junc 859	1.84	115.83
Junc 86	1.84	38.06
Junc 861	0.00	122.68
Junc 863	0.00	123.39
Junc 865	0.00	125.40
Junc 867	0.00	124.61
Junc 869	1.82	126.88
Junc 87	2.69	92.08

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 871	1.82	126.71
Junc 873	1.82	125.80
Junc 875	1.82	125.56
Junc 877	1.82	125.70
Junc 879	1.82	125.13
Junc 88	2.69	66.59
Junc 881	1.82	124.82
Junc 883	1.82	124.62
Junc 885	1.84	116.90
Junc 887	1.84	118.97
Junc 889	1.84	118.90
Junc 89	2.69	87.74
Junc 891	1.84	121.22
Junc 893	1.84	110.55
Junc 895	1.84	107.98
Junc 897	1.84	107.98
Junc 899	1.84	114.04
Junc 9	1.84	33.65
Junc 90	1.84	51.64
Junc 901	1.84	104.29
Junc 903	1.84	130.58
Junc 905	1.84	129.71
Junc 907	1.84	127.98
Junc 9085	1.84	38.93
Junc 9087	1.82	55.03
Junc 9089	1.84	40.23
Junc 909	3.80	128.81
Junc 9091	1.84	33.30
Junc 9093	2.69	46.00
Junc 91	2.69	104.04
Junc 911	5.76	129.70

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 913	1.84	144.46
Junc 915	1.84	141.89
Junc 917	1.84	139.72
Junc 919	1.84	95.25
Junc 92	1.84	140.51
Junc 921	1.84	88.34
Junc 923	1.84	87.43
Junc 925	1.84	67.49
Junc 927	1.84	62.72
Junc 929	1.84	78.74
Junc 93	2.69	90.06
Junc 931	1.84	88.29
Junc 933	1.84	78.74
Junc 935	1.84	87.36
Junc 937	1.84	86.46
Junc 939	1.84	87.32
Junc 94	1.82	106.84
Junc 941	1.84	95.11
Junc 943	1.84	96.83
Junc 945	3.46	34.34
Junc 947	1.82	124.58
Junc 949	1.82	123.89
Junc 95	2.69	94.40
Junc 951	1.82	124.42
Junc 953	1.84	121.51
Junc 955	1.84	121.51
Junc 957	1.84	123.68
Junc 959	1.84	123.68
Junc 96	1.82	106.84
Junc 961	1.84	122.81
Junc 963	1.84	119.78

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 965	1.84	124.64
Junc 967	1.84	125.50
Junc 969	1.84	125.33
Junc 97	2.69	46.73
Junc 971	1.84	122.92
Junc 972	1.84	122.05
Junc 973	0.00	125.31
Junc 974	1.84	121.62
Junc 975	1.82	80.17
Junc 977	1.82	123.05
Junc 978	1.82	120.30
Junc 979	1.82	120.59
Junc 98	1.82	106.84
Junc 980	3.52	117.99
Junc 981	1.82	113.86
Junc 983	1.82	113.50
Junc 985	1.82	110.91
Junc 987	1.84	115.51
Junc 988	1.84	116.99
Junc 989	1.84	117.43
Junc 99	2.69	78.80
Junc 990	1.84	117.44
Junc 991	1.84	118.76
Junc 992	1.84	116.14
Junc 993	1.84	120.61
Junc 995	1.84	122.44
Junc 996	1.84	117.01
Junc 997	1.82	123.50
Junc 999	1.82	119.60
Junc J10	0.00	3040.99
Junc J12	0.00	3150.03

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc J16	1.84	99.24
Junc J18	0.00	6.94
Junc J22	0.00	110.33
Junc J26	0.00	108.65
Junc J34	1.84	35.03
Junc J36	3.46	46.91
Junc J38	2.69	144.48
Junc J40	1.84	143.62
Junc J42	1.84	143.62
Junc J44	2.69	143.18
Junc J46	2.69	141.02
Junc J48	2.69	139.28
Junc J50	1.84	116.27
Junc J52	1.84	114.69
Junc J54	1.84	114.69
Junc J56	1.84	115.33
Junc J58	1.84	115.33
Junc J60	1.84	115.06
Junc WESTSTMBT1	1.60	61.00
Junc U7000_NU	0.00	6.46
Junc U7000_ND	0.00	119.64
Junc 7081_NU	0.00	148.31
Junc 7081_ND	0.00	38.93
Junc 7083_NU	0.00	112.30
Junc 7083_ND	0.00	55.03
Junc 7085_NU	0.00	149.25
Junc 7085_ND	0.00	40.23
Junc 7087_NU	0.00	142.68
Junc 7087_ND	0.00	33.30
Junc 7089_NU	0.00	151.37
Junc 7089_ND	0.00	46.00

SCENARIO 1 - CITY ONLY

Node ID	Demand GPM	Pressure psi
Junc 7090_NU	0.00	147.08
Junc 7090_ND	0.00	38.06
Junc 32	0.00	-38.25
Junc 34	0.00	15.09
Junc 36	48.00	-2.69
Junc 38	71.68	10.26
Junc 40	0.00	20.00
Junc 42	83.20	27.54
Junc 48	0.00	15.70
Junc 46	0.00	-38.25
Junc 55	0.00	61.00
Junc 57	0.00	61.00
Resvr Fish	-1088.20	0.00
Resvr Willet	-1511.65	0.00
Resvr 44	353.77	0.00
Tank City	1023.31	6.94
Tank WilletTank	1677.06	7.35
Tank FishTank	-5129.66	6.58
Tank Steamboat2	0.00	0.00
Tank CLEARWELL	-353.77	6.51
Tank North	-3295.61	7.34

SCENARIO 2 - WITH WSSA DEVELOPMENT

Network Table - Nodes at 14:00 Hrs

Node ID	Demand GPM	Pressure psi
Junc 1	0.00	13.41
Junc 10	2.69	94.64
Junc 100	1.82	141.36
Junc 1001	1.82	136.62
Junc 1003	1.82	117.36
Junc 1005	1.82	137.80
Junc 1007	1.82	104.48
Junc 1009	2.69	12.71
Junc 101	2.69	79.03
Junc 1011	2.69	7.57
Junc 1013	3.52	110.84
Junc 1015	3.52	105.78
Junc 1017	1.82	140.28
Junc 1019	1.82	140.02
Junc 102	3.68	78.58
Junc 1021	1.82	140.87
Junc 1023	1.82	140.87
Junc 1024	1.82	137.71
Junc 1025	1.82	144.29
Junc 1026	1.82	141.52
Junc 1027	1.82	145.15
Junc 1029	1.82	145.19
Junc 103	2.69	92.03
Junc 1031	1.82	145.02
Junc 1033	1.82	145.71
Junc 1035	1.82	143.88
Junc 1037	1.82	145.15

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 1039	1.82	146.02
Junc 104	3.67	72.01
Junc 1041	1.82	139.60
Junc 1043	1.82	139.29
Junc 1045	1.82	144.06
Junc 1047	1.82	138.86
Junc 1049	1.82	139.13
Junc 105	2.69	108.49
Junc 1051	1.82	139.13
Junc 1053	1.82	139.06
Junc 1055	1.82	139.06
Junc 1057	1.82	138.65
Junc 1059	1.82	138.05
Junc 106	3.68	74.58
Junc 1061	1.82	135.06
Junc 1063	1.82	135.06
Junc 1065	1.82	131.49
Junc 1067	1.82	133.20
Junc 1069	1.82	122.52
Junc 107	2.69	79.03
Junc 1071	1.82	120.51
Junc 1073	1.82	120.57
Junc 1075	1.82	120.35
Junc 1077	1.82	120.35
Junc 1079	1.82	121.70
Junc 108	3.67	84.14
Junc 1081	1.82	120.00
Junc 1083	1.82	119.14

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 1085	1.82	139.06
Junc 1087	1.82	141.80
Junc 1089	1.82	146.24
Junc 109	2.69	79.89
Junc 1091	1.82	147.97
Junc 1093	1.82	143.71
Junc 1095	1.82	147.26
Junc 1097	1.82	149.92
Junc 1099	1.82	142.52
Junc 11	1.84	6.84
Junc 110	2.69	87.47
Junc 1101	1.82	143.39
Junc 1103	1.82	144.25
Junc 1105	1.82	148.58
Junc 1107	1.82	94.96
Junc 1109	1.82	101.02
Junc 111	2.69	83.36
Junc 1111	1.82	95.82
Junc 1113	1.82	97.56
Junc 1115	1.82	100.16
Junc 1117	1.82	98.86
Junc 1119	1.82	98.42
Junc 112	2.69	89.85
Junc 1121	1.82	98.42
Junc 1123	1.82	101.02
Junc 1125	1.82	101.89
Junc 1127	1.82	101.89
Junc 1129	1.82	101.89

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 113	1.84	106.82
Junc 1131	1.82	101.89
Junc 1133	1.82	101.02
Junc 1135	1.82	100.16
Junc 1137	1.82	101.02
Junc 1139	1.82	101.89
Junc 114	1.82	131.08
Junc 1141	1.82	101.89
Junc 1143	1.82	139.01
Junc 1145	1.82	122.20
Junc 1147	1.82	119.87
Junc 1149	1.82	118.68
Junc 115	1.84	104.22
Junc 1151	1.82	116.53
Junc 1153	1.82	112.24
Junc 1155	1.82	107.08
Junc 1157	1.82	104.11
Junc 1159	1.82	100.67
Junc 116	1.82	121.17
Junc 1161	1.82	100.23
Junc 1163	1.82	104.51
Junc 1165	1.82	109.66
Junc 1167	1.82	113.52
Junc 1169	1.82	113.98
Junc 117	1.84	124.15
Junc 1171	1.82	112.68
Junc 1173	1.82	111.90
Junc 1175	1.82	114.10

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 1177	1.82	118.38
Junc 1179	1.82	118.33
Junc 118	1.82	113.41
Junc 1181	1.82	120.04
Junc 1183	1.82	116.57
Junc 1185	1.82	113.97
Junc 1187	1.82	101.81
Junc 1188	1.82	97.48
Junc 1189	1.82	114.31
Junc 119	1.84	86.90
Junc 1191	1.82	115.18
Junc 1193	1.82	112.49
Junc 1195	1.82	110.58
Junc 1197	1.82	105.79
Junc 1199	1.82	97.92
Junc 12	2.69	82.96
Junc 120	1.82	110.91
Junc 1201	1.82	88.39
Junc 1203	5600.00	64.07
Junc 1207	1.82	48.10
Junc 1209	1.82	104.00
Junc 1211	1.82	98.32
Junc 1213	1.82	96.13
Junc 1215	1.82	93.94
Junc 1217	1.82	99.65
Junc 1219	1.82	101.80
Junc 122	1.82	110.95
Junc 1221	1.82	101.89

Node ID	Demand GPM	Pressure psi
Junc 1223	1.82	102.76
Junc 1225	1.82	101.89
Junc 1227	1.82	101.89
Junc 1229	1.82	104.06
Junc 123	2.69	48.33
Junc 1231	2.69	92.90
Junc 1233	2.69	84.22
Junc 1235	2.69	79.98
Junc 1237	2.69	70.86
Junc 1238	2.69	66.53
Junc 1239	2.69	65.29
Junc 124	1.82	112.70
Junc 1243	2.69	73.94
Junc 1245	2.69	71.34
Junc 1247	2.69	69.61
Junc 1249	2.69	80.01
Junc 125	2.69	48.30
Junc 1251	2.69	82.61
Junc 1253	2.69	96.47
Junc 1255	2.69	103.40
Junc 1257	2.69	106.00
Junc 1259	2.69	94.74
Junc 126	1.82	112.71
Junc 1263	2.69	92.14
Junc 1265	2.69	80.00
Junc 1267	2.69	83.47
Junc 1269	1.82	109.95
Junc 1271	1.82	109.95

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 1273	1.82	112.19
Junc 1275	3.81	130.39
Junc 1276	3.81	124.17
Junc 1277	3.81	124.16
Junc 1279	3.81	125.33
Junc 128	1.82	108.32
Junc 1281	2.69	152.31
Junc 1285	2.69	152.29
Junc 1287	1.82	45.23
Junc 1289	1.82	45.84
Junc 129	2.69	48.30
Junc 1291	1.82	46.18
Junc 1293	1.82	46.18
Junc 1295	1.82	46.18
Junc 1297	1.82	45.84
Junc 1299	1.82	46.33
Junc 13	2.69	14.10
Junc 130	1.82	110.86
Junc 1301	1.82	50.42
Junc 1303	3.46	67.88
Junc 1311	3.46	80.88
Junc 1313	3.46	73.08
Junc 1315	3.46	66.15
Junc 1317	3.46	57.48
Junc 1318	2.67	141.28
Junc 1319	1.82	145.24
Junc 132	1.82	113.41
Junc 1320	0.00	141.30

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 1321	1.82	145.28
Junc 1323	1.82	145.28
Junc 1324	3.46	53.15
Junc 1325	2.69	109.36
Junc 1326	3.46	50.55
Junc 1327	2.69	113.67
Junc 1329	2.69	117.99
Junc 133	2.69	40.50
Junc 1331	2.69	129.24
Junc 1333	2.69	124.90
Junc 1335	2.69	130.95
Junc 1337	2.69	142.20
Junc 1339	2.69	143.50
Junc 134	1.82	110.91
Junc 1340	1.82	106.22
Junc 1341	2.69	139.16
Junc 1345	2.69	4.30
Junc 1347	2.69	6.47
Junc 1349	4.26	112.44
Junc 135	2.69	32.70
Junc 1351	4.26	116.77
Junc 1353	4.26	117.63
Junc 1355	4.26	108.10
Junc 1357	1.84	102.88
Junc 1358	1.84	102.45
Junc 1359	4.26	112.44
Junc 136	1.82	110.94
Junc 1360	1.84	106.78

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 1363	1.84	108.95
Junc 1365	1.84	110.68
Junc 137	2.69	55.19
Junc 1373	2.69	123.33
Junc 1375	2.69	134.60
Junc 1377	1.82	131.87
Junc 1379	1.82	125.23
Junc 138	1.82	108.31
Junc 1381	1.82	114.54
Junc 1383	1.82	114.32
Junc 1385	1.82	115.78
Junc 1387	1.82	116.08
Junc 139	2.69	56.91
Junc 1397	1.82	99.43
Junc 1399	1.82	106.21
Junc 14	2.69	76.04
Junc 140	1.82	108.34
Junc 1400	1.82	112.16
Junc 1401	1.82	113.01
Junc 1402	1.82	111.30
Junc 1403	1.82	114.37
Junc 1405	1.82	117.78
Junc 1407	1.82	117.38
Junc 1409	1.82	125.53
Junc 141	2.69	42.98
Junc 1411	0.00	93.93
Junc 1413	0.00	61.79
Junc 1415	0.00	95.18

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 1417	0.00	58.47
Junc 1418	0.00	66.31
Junc 1419	0.00	75.89
Junc 142	1.84	74.50
Junc 1421	32.00	82.09
Junc 143	2.69	42.94
Junc 144	1.84	63.26
Junc 145	2.69	48.98
Junc 146	1.84	64.12
Junc 147	2.69	64.52
Junc 148	1.84	43.75
Junc 149	2.69	65.37
Junc 15	2.69	-16.41
Junc 150	1.84	62.37
Junc 151	2.69	68.84
Junc 152	1.84	68.90
Junc 1520	1.82	108.01
Junc 1521	1.82	96.84
Junc 1522	1.82	86.07
Junc 1523	1.82	87.15
Junc 1526	1.82	95.04
Junc 1527	1.82	97.72
Junc 1528	1.82	89.92
Junc 153	2.69	76.61
Junc 1530	1.84	101.20
Junc 1531	0.00	103.36
Junc 1532	1.84	104.66
Junc 1533	1.82	104.49

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 154	2.67	67.17
Junc 155	2.69	101.70
Junc 156	1.84	90.14
Junc 157	2.69	101.67
Junc 158	1.84	77.59
Junc 159	2.69	108.60
Junc 16	2.69	81.24
Junc 160	1.84	74.98
Junc 1600	1.84	44.51
Junc 1602	1.84	51.87
Junc 1604	1.84	48.84
Junc 1606	1.84	45.37
Junc 1608	1.84	43.64
Junc 161	2.69	101.23
Junc 162	1.84	80.65
Junc 163	2.69	96.50
Junc 165	2.69	80.56
Junc 166	1.84	137.43
Junc 167	2.69	65.94
Junc 168	1.84	41.69
Junc 169	2.69	123.28
Junc 17	2.69	-3.64
Junc 170	1.84	150.64
Junc 171	2.69	114.99
Junc 172	1.84	119.75
Junc 174	1.84	119.75
Junc 175	2.69	34.43
Junc 176	1.84	115.90

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 177	2.69	34.43
Junc 178	1.84	110.23
Junc 179	2.69	19.27
Junc 18	2.69	88.21
Junc 183	1.84	80.03
Junc 184	1.82	113.06
Junc 185	1.84	81.77
Junc 186	1.82	144.67
Junc 187	1.84	59.24
Junc 188	1.82	140.11
Junc 189	1.84	55.77
Junc 19	2.69	-2.00
Junc 190	1.82	108.42
Junc 191	1.84	44.94
Junc 192	3.52	92.67
Junc 193	1.84	37.57
Junc 194	0.00	114.22
Junc 196	0.00	111.62
Junc 197	1.84	141.48
Junc 198	0.00	102.90
Junc 199	1.84	143.21
Junc 2	0.00	12.52
Junc 20	1.82	110.22
Junc 200	1.84	112.48
Junc 201	1.84	160.54
Junc 203	1.84	60.11
Junc 205	1.84	53.17
Junc 207	1.84	71.55

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 208	1.84	80.65
Junc 209	1.84	71.55
Junc 21	2.69	56.67
Junc 210	1.84	110.23
Junc 215	1.84	55.78
Junc 216	1.82	76.63
Junc 217	1.84	41.91
Junc 218	1.82	71.45
Junc 219	1.84	40.18
Junc 22	1.82	109.57
Junc 227	2.69	137.00
Junc 229	2.69	137.86
Junc 23	2.69	65.29
Junc 231	2.69	144.36
Junc 235	2.69	149.13
Junc 237	2.69	151.73
Junc 239	2.69	150.86
Junc 24	1.82	105.00
Junc 241	2.69	146.53
Junc 242	2.69	146.09
Junc 243	2.69	145.23
Junc 244	2.69	142.19
Junc 245	2.69	145.23
Junc 246	2.69	134.83
Junc 247	2.69	145.23
Junc 248	2.69	132.23
Junc 249	2.69	133.09
Junc 25	2.69	74.81

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 250	2.69	136.13
Junc 251	2.69	129.19
Junc 252	2.69	136.99
Junc 253	2.69	118.80
Junc 255	2.69	111.00
Junc 257	2.69	105.80
Junc 259	2.69	111.00
Junc 26	1.82	100.32
Junc 261	2.69	117.07
Junc 263	2.69	96.27
Junc 264	2.69	89.35
Junc 265	2.69	95.41
Junc 267	2.69	124.00
Junc 268	2.69	125.73
Junc 269	2.69	125.73
Junc 27	1.84	89.51
Junc 270	2.69	130.93
Junc 271	1.84	51.44
Junc 272	2.69	117.07
Junc 273	1.84	44.51
Junc 275	2.69	149.56
Junc 277	2.69	53.84
Junc 279	2.69	53.84
Junc 28	1.82	107.25
Junc 281	2.69	50.52
Junc 283	2.69	50.52
Junc 285	1.84	116.88
Junc 287	2.69	58.95

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 289	2.69	59.01
Junc 29	1.84	85.17
Junc 291	2.69	52.72
Junc 293	2.69	51.06
Junc 295	2.69	47.80
Junc 297	2.69	153.57
Junc 299	2.69	148.07
Junc 3	0.00	12.65
Junc 30	1.84	109.86
Junc 301	2.69	141.67
Junc 302	2.69	148.17
Junc 303	2.69	138.34
Junc 304	2.69	133.14
Junc 305	2.69	139.20
Junc 307	2.69	143.54
Junc 309	2.69	126.60
Junc 31	1.84	112.02
Junc 311	2.69	130.06
Junc 313	2.69	125.75
Junc 315	3.67	89.34
Junc 317	3.67	87.18
Junc 319	3.68	84.58
Junc 321	3.68	73.74
Junc 323	3.67	75.91
Junc 325	3.68	81.98
Junc 327	3.68	75.91
Junc 329	3.68	69.41
Junc 33	1.84	131.08

Node ID	Demand GPM	Pressure psi
Junc 331	3.67	75.05
Junc 333	3.67	82.41
Junc 335	3.67	90.18
Junc 337	3.67	87.65
Junc 339	3.67	88.21
Junc 341	3.67	92.54
Junc 343	3.67	87.47
Junc 345	3.67	90.94
Junc 347	3.68	86.66
Junc 348	0.00	82.39
Junc 349	3.67	77.93
Junc 35	1.84	130.22
Junc 351	2.69	33.06
Junc 357	3.68	75.91
Junc 359	3.68	71.58
Junc 361	3.67	80.62
Junc 363	3.67	73.69
Junc 365	3.67	66.78
Junc 367	3.68	63.75
Junc 369	3.67	75.71
Junc 37	1.84	132.81
Junc 371	3.68	73.98
Junc 373	3.67	95.68
Junc 375	3.52	103.24
Junc 377	3.52	103.20
Junc 379	3.67	64.62
Junc 381	3.67	62.45
Junc 383	3.68	49.45

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 385	3.68	49.45
Junc 387	3.67	58.98
Junc 389	3.68	57.25
Junc 39	1.84	142.78
Junc 391	3.67	70.25
Junc 393	3.67	61.58
Junc 395	3.67	54.65
Junc 397	3.52	103.19
Junc 399	3.52	101.82
Junc 4	0.00	2.73
Junc 401	3.52	90.52
Junc 403	3.52	92.67
Junc 405	3.52	90.52
Junc 407	3.52	105.20
Junc 409	3.52	95.67
Junc 41	1.84	131.95
Junc 413	3.67	76.62
Junc 415	3.68	65.35
Junc 417	3.52	86.95
Junc 419	3.52	106.58
Junc 421	3.52	107.01
Junc 427	3.52	103.75
Junc 429	3.52	107.14
Junc 43	1.84	137.15
Junc 430	1.84	102.37
Junc 431	7.55	92.41
Junc 433	7.55	106.27
Junc 437	3.52	109.25

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 441	3.52	72.28
Junc 443	3.52	59.28
Junc 445	3.52	69.68
Junc 447	3.52	56.68
Junc 449	3.52	57.55
Junc 45	1.84	131.08
Junc 451	3.68	77.61
Junc 453	3.68	73.71
Junc 454	3.68	73.28
Junc 455	3.68	71.54
Junc 456	3.68	71.54
Junc 457	2.69	49.09
Junc 458	3.68	74.58
Junc 459	2.69	41.61
Junc 460	1.84	71.98
Junc 461	2.69	36.33
Junc 463	2.69	16.43
Junc 467	2.69	39.79
Junc 469	3.46	86.16
Junc 47	1.84	122.41
Junc 471	3.46	80.09
Junc 473	3.46	76.62
Junc 475	3.46	71.42
Junc 477	3.46	62.32
Junc 479	3.46	54.95
Junc 481	3.46	47.16
Junc 483	3.46	55.82
Junc 485	3.46	64.49

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 487	3.46	89.62
Junc 489	3.46	82.79
Junc 49	1.84	130.22
Junc 491	3.46	82.89
Junc 493	3.46	48.39
Junc 495	3.46	48.82
Junc 497	3.46	64.42
Junc 499	3.46	67.02
Junc 5	2.69	10.41
Junc 50	1.84	64.87
Junc 501	3.46	77.43
Junc 503	3.46	89.57
Junc 505	3.46	99.10
Junc 507	3.46	83.93
Junc 509	3.46	103.44
Junc 51	1.84	130.22
Junc 511	3.46	56.62
Junc 513	3.46	84.36
Junc 515	3.46	103.49
Junc 517	3.46	103.49
Junc 519	3.46	103.49
Junc 52	1.84	74.40
Junc 521	3.46	100.12
Junc 523	3.46	102.82
Junc 525	7.55	117.12
Junc 527	3.52	107.90
Junc 529	7.55	114.54
Junc 53	1.84	82.57

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 531	3.52	110.30
Junc 533	3.52	106.01
Junc 535	3.52	106.01
Junc 537	3.52	106.03
Junc 539	3.52	102.56
Junc 54	0.00	64.44
Junc 540	7.55	109.44
Junc 541	3.52	113.33
Junc 542	3.52	113.29
Junc 543	7.55	119.19
Junc 545	3.46	114.19
Junc 547	3.46	108.41
Junc 549	3.46	108.68
Junc 551	3.46	124.60
Junc 553	7.55	124.63
Junc 555	7.55	124.64
Junc 557	7.55	120.78
Junc 559	7.55	122.52
Junc 56	0.00	67.47
Junc 561	3.80	122.95
Junc 563	3.80	125.86
Junc 565	3.80	129.66
Junc 567	3.46	109.55
Junc 569	3.80	126.29
Junc 571	3.80	129.90
Junc 573	3.80	129.78
Junc 575	3.81	129.77
Junc 577	7.55	120.41

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 579	3.46	90.43
Junc 58	1.84	57.07
Junc 581	3.46	86.10
Junc 583	3.46	103.43
Junc 585	3.46	100.85
Junc 587	3.46	107.80
Junc 589	3.46	107.80
Junc 59	2.69	54.56
Junc 591	3.46	108.67
Junc 593	3.46	106.06
Junc 595	3.46	108.66
Junc 597	3.46	101.52
Junc 599	3.52	107.83
Junc 6	2.69	13.24
Junc 60	1.84	51.87
Junc 601	3.52	114.59
Junc 603	7.55	118.49
Junc 605	3.52	111.85
Junc 607	7.55	113.68
Junc 609	3.52	111.35
Junc 611	3.52	110.85
Junc 615	3.52	113.34
Junc 617	7.55	114.14
Junc 619	7.55	116.73
Junc 62	1.84	53.61
Junc 621	7.55	116.73
Junc 623	7.55	112.81
Junc 625	7.55	117.58

Node ID	Demand GPM	Pressure psi
Junc 627	3.80	128.43
Junc 629	3.80	128.42
Junc 63	2.69	48.11
Junc 631	3.81	129.27
Junc 633	3.80	134.89
Junc 635	3.81	129.92
Junc 637	3.81	130.79
Junc 639	3.81	126.91
Junc 64	1.84	52.96
Junc 641	3.80	126.94
Junc 643	3.81	127.80
Junc 645	3.81	133.00
Junc 647	3.80	133.44
Junc 649	3.81	125.92
Junc 65	2.69	48.11
Junc 651	3.80	125.97
Junc 653	3.81	130.29
Junc 655	3.81	132.45
Junc 656	3.81	132.55
Junc 657	3.80	124.02
Junc 659	3.81	124.45
Junc 66	1.84	85.67
Junc 661	3.81	131.82
Junc 663	3.80	124.27
Junc 667	3.80	124.29
Junc 669	3.81	123.01
Junc 67	2.69	55.33
Junc 671	3.81	123.03

Node ID	Demand GPM	Pressure psi
Junc 673	3.81	123.05
Junc 674	3.81	123.03
Junc 675	3.81	131.26
Junc 677	3.81	131.26
Junc 679	3.81	129.84
Junc 68	1.84	81.34
Junc 680	3.81	129.30
Junc 681	3.81	124.67
Junc 683	3.80	121.76
Junc 685	3.67	117.53
Junc 687	3.67	103.68
Junc 689	3.67	93.02
Junc 69	2.69	57.00
Junc 691	3.68	93.01
Junc 693	3.68	105.13
Junc 695	3.68	107.30
Junc 697	3.80	94.30
Junc 699	3.81	114.95
Junc 7	2.69	19.47
Junc 70	1.84	65.53
Junc 701	3.67	112.18
Junc 703	3.67	120.01
Junc 7049	0.00	3041.52
Junc 705	3.81	121.75
Junc 707	3.80	111.06
Junc 709	3.80	123.65
Junc 71	2.69	57.00
Junc 711	1.84	134.48

Node ID	Demand GPM	Pressure psi
Junc 713	1.84	134.04
Junc 715	1.84	134.04
Junc 717	1.84	133.33
Junc 719	1.84	131.58
Junc 72	1.84	81.56
Junc 721	3.80	124.32
Junc 723	3.80	122.04
Junc 725	3.81	122.04
Junc 727	3.81	124.27
Junc 729	1.84	134.71
Junc 73	2.69	49.10
Junc 731	3.80	116.78
Junc 733	3.67	113.92
Junc 735	3.67	101.83
Junc 737	3.67	90.97
Junc 739	3.67	104.95
Junc 74	1.84	76.15
Junc 741	7.55	120.21
Junc 743	3.80	120.12
Junc 745	7.55	121.53
Junc 747	3.81	121.48
Junc 749	7.55	116.10
Junc 75	2.69	69.99
Junc 751	7.55	117.84
Junc 753	7.55	118.00
Junc 754	1.84	117.92
Junc 755	1.84	122.15
Junc 756	1.84	100.16

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 757	1.84	108.34
Junc 759	1.84	130.54
Junc 76	1.84	81.35
Junc 761	1.84	130.24
Junc 763	1.84	130.75
Junc 765	1.84	130.25
Junc 767	1.84	128.40
Junc 768	1.84	129.95
Junc 769	1.84	127.60
Junc 77	2.69	69.84
Junc 771	1.84	126.40
Junc 773	1.84	126.47
Junc 775	1.84	126.04
Junc 777	1.84	125.61
Junc 779	1.84	121.52
Junc 78	1.84	43.64
Junc 781	1.84	124.37
Junc 783	1.84	119.60
Junc 785	1.84	120.66
Junc 787	1.84	122.39
Junc 789	1.84	119.72
Junc 79	2.69	65.51
Junc 790	0.00	96.74
Junc 791	1.84	114.17
Junc 793	3.46	103.43
Junc 795	3.46	105.16
Junc 797	3.46	108.23
Junc 799	3.46	108.67

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 8	2.69	9.66
Junc 80	1.84	145.66
Junc 801	3.46	108.63
Junc 803	3.46	67.88
Junc 805	3.46	68.75
Junc 807	3.46	63.55
Junc 809	3.46	68.69
Junc 81	2.69	69.83
Junc 811	3.80	80.74
Junc 813	3.80	133.38
Junc 815	3.80	133.32
Junc 817	3.46	112.02
Junc 819	3.46	49.69
Junc 82	1.84	141.76
Junc 821	3.81	134.27
Junc 823	3.81	134.27
Junc 825	3.80	133.15
Junc 827	3.80	133.20
Junc 829	3.81	131.55
Junc 83	2.69	84.87
Junc 831	3.81	133.58
Junc 833	3.80	135.31
Junc 835	3.80	137.04
Junc 837	3.80	132.76
Junc 839	3.81	131.16
Junc 84	1.84	147.39
Junc 841	3.80	130.72
Junc 843	3.80	136.50

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 845	3.81	135.63
Junc 847	3.80	135.63
Junc 849	3.80	135.63
Junc 85	2.69	93.01
Junc 851	3.81	133.16
Junc 853	3.81	137.58
Junc 855	3.80	136.90
Junc 857	0.00	135.19
Junc 859	1.84	129.53
Junc 86	1.84	38.44
Junc 861	0.00	136.21
Junc 863	0.00	137.90
Junc 865	0.00	140.61
Junc 867	0.00	140.64
Junc 869	1.82	140.20
Junc 87	2.69	92.14
Junc 871	1.82	140.15
Junc 873	1.82	139.88
Junc 875	1.82	139.81
Junc 877	1.82	140.78
Junc 879	1.82	141.23
Junc 88	2.69	67.68
Junc 881	1.82	141.14
Junc 883	1.82	141.08
Junc 885	1.84	131.11
Junc 887	1.84	133.58
Junc 889	1.84	133.56
Junc 89	2.69	87.79

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 891	1.84	136.58
Junc 893	1.84	125.23
Junc 895	1.84	122.66
Junc 897	1.84	122.66
Junc 899	1.84	127.82
Junc 9	1.84	33.46
Junc 90	1.84	52.73
Junc 901	1.84	118.37
Junc 903	1.84	133.72
Junc 905	1.84	132.86
Junc 907	1.84	131.12
Junc 9085	1.84	39.31
Junc 9087	1.82	97.56
Junc 9089	1.84	40.61
Junc 909	3.80	134.69
Junc 9091	1.84	33.68
Junc 9093	2.69	46.00
Junc 91	2.69	104.20
Junc 911	5.76	136.60
Junc 913	1.84	159.15
Junc 915	1.84	156.57
Junc 917	1.84	154.40
Junc 919	1.84	109.84
Junc 92	1.84	140.61
Junc 921	1.84	102.91
Junc 923	1.84	102.35
Junc 925	1.84	82.86
Junc 927	1.84	77.85

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 929	1.84	93.69
Junc 93	2.69	90.29
Junc 931	1.84	103.21
Junc 933	1.84	93.68
Junc 935	1.84	102.19
Junc 937	1.84	101.22
Junc 939	1.84	102.06
Junc 94	1.82	141.36
Junc 941	1.84	109.86
Junc 943	1.84	111.52
Junc 945	3.46	40.58
Junc 947	1.82	141.07
Junc 949	1.82	140.87
Junc 95	2.69	94.63
Junc 951	1.82	141.02
Junc 953	1.84	136.96
Junc 955	1.84	136.96
Junc 957	1.84	139.65
Junc 959	1.84	139.65
Junc 96	1.82	141.36
Junc 961	1.84	138.78
Junc 963	1.84	135.75
Junc 965	1.84	141.08
Junc 967	1.84	142.48
Junc 969	1.84	142.41
Junc 97	2.69	46.96
Junc 971	1.84	142.85
Junc 972	1.84	141.99

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc 973	0.00	142.34
Junc 974	1.84	141.55
Junc 975	1.82	97.75
Junc 977	1.82	142.48
Junc 978	1.82	142.07
Junc 979	1.82	142.11
Junc 98	1.82	141.36
Junc 980	3.52	139.51
Junc 981	1.82	138.90
Junc 983	1.82	140.32
Junc 985	1.82	139.93
Junc 987	1.84	142.52
Junc 988	1.84	144.64
Junc 989	1.84	142.95
Junc 99	2.69	79.03
Junc 990	1.84	143.28
Junc 991	1.84	143.24
Junc 992	1.84	141.98
Junc 993	1.84	143.66
Junc 995	1.84	144.08
Junc 996	1.84	142.85
Junc 997	1.82	140.82
Junc 999	1.82	136.43
Junc J10	0.00	3041.31
Junc J12	0.00	3150.26
Junc J16	1.84	99.41
Junc J18	0.00	6.52
Junc J22	0.00	142.58

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc J26	0.00	140.87
Junc J34	1.84	35.41
Junc J36	3.46	53.15
Junc J38	2.69	144.79
Junc J40	1.84	143.93
Junc J42	1.84	143.93
Junc J44	2.69	143.49
Junc J46	2.69	141.33
Junc J48	2.69	139.59
Junc J50	1.84	117.59
Junc J52	1.84	142.70
Junc J54	1.84	142.70
Junc J56	1.84	143.17
Junc J58	1.84	143.17
Junc J60	1.84	142.76
Junc WESTSTMBT1	1.60	99.45
Junc U7000_NU	0.00	7.13
Junc U7000_ND	0.00	117.44
Junc 7081_NU	0.00	148.41
Junc 7081_ND	0.00	39.31
Junc 7083_NU	0.00	148.58
Junc 7083_ND	0.00	97.56
Junc 7085_NU	0.00	149.56
Junc 7085_ND	0.00	40.61
Junc 7087_NU	0.00	142.78
Junc 7087_ND	0.00	33.68
Junc 7089_NU	0.00	153.57
Junc 7089_ND	0.00	46.00

SCENARIO 2 - WITH WSSA DEVELOPMENT

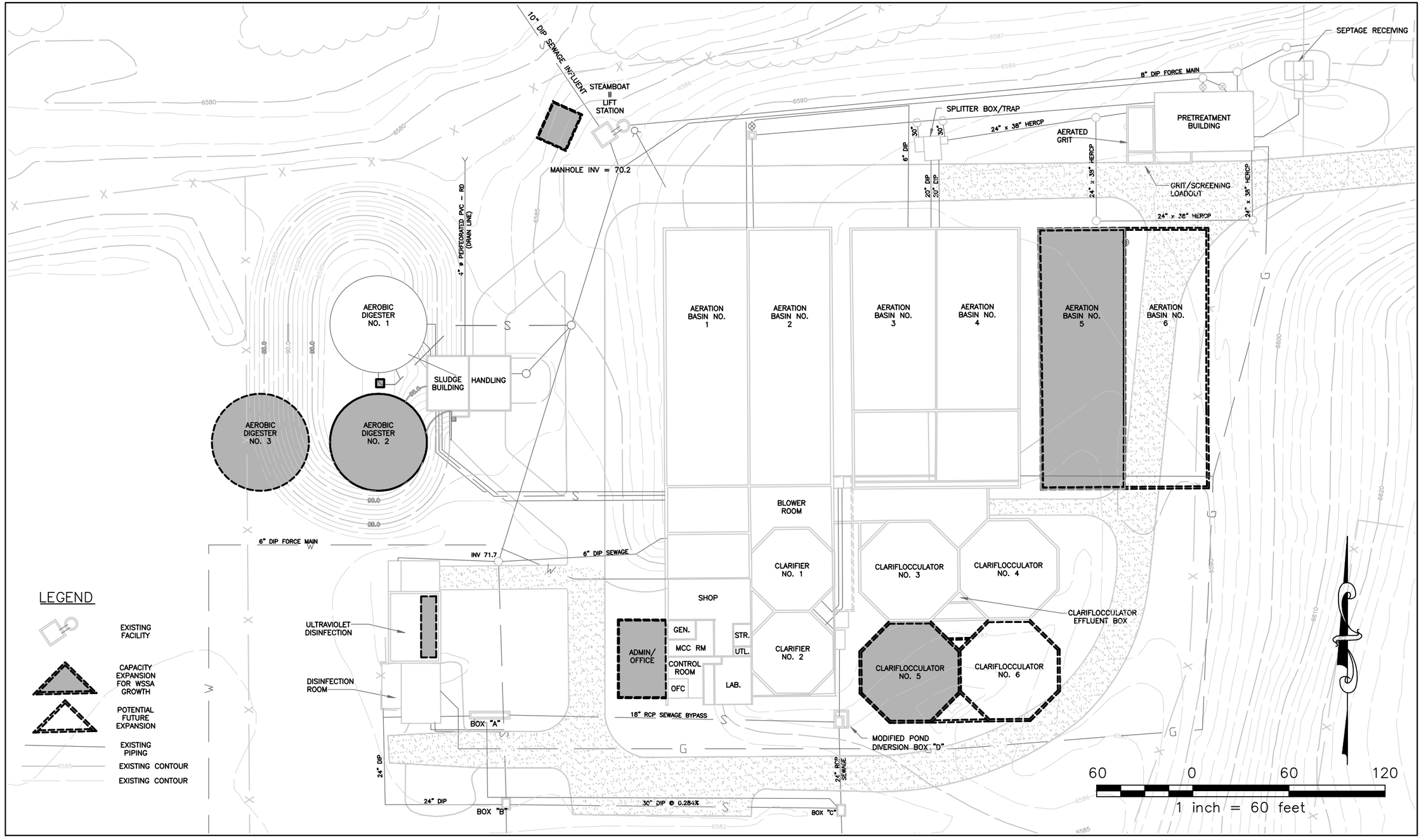
Node ID	Demand GPM	Pressure psi
Junc 7090_NU	0.00	147.39
Junc 7090_ND	0.00	38.44
Junc 32	0.00	45.05
Junc 34	0.00	101.03
Junc 36	0.00	83.93
Junc 38	0.00	97.28
Junc 40	0.00	105.36
Junc 42	83.20	114.78
Junc 48	0.00	18.02
Junc 46	0.00	44.80
Junc 55	0.00	99.70
Junc 57	0.00	99.45
Junc J1352	0.00	4.40
Junc J1353	0.00	55.96
Junc J1419	4.80	52.49
Junc J1344	4.80	51.19
Junc J1345	0.00	60.72
Junc J1387	0.00	74.15
Junc J1418	0.00	90.18
Junc J1421	16.00	99.28
Junc J1422	0.00	102.31
Junc J1346	0.00	116.61
Junc J1347	0.00	118.34
Junc J1367	0.00	126.14
Junc J1425	0.00	122.68
Junc J1451	0.00	116.62
Junc J1349	0.00	113.59
Junc J1374	0.00	115.31

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Junc J1406	4.80	127.01
Junc J1350	8.00	122.67
Junc J1351	0.00	138.27
Junc J1404	0.00	133.94
Junc J1417	16.00	127.87
Junc J8	0.00	126.14
Junc 121	0.00	70.66
Junc 127	0.00	75.02
Junc 131	0.00	46.75
Junc 164	0.00	72.87
Junc 173	0.00	45.00
Junc 180	0.00	77.29
Junc 181	0.00	45.00
Junc 182	0.00	79.91
Junc 195	0.00	101.55
Junc 202	0.00	92.23
Junc 204	0.00	84.35
Junc 206	0.00	54.16
Junc 211	0.00	58.35
Junc 212	0.00	101.66
Junc 213	0.00	101.99
Resvr Fish	-1158.48	0.00
Resvr Willet	-1120.29	0.00
Resvr ElkRiver	586.55	0.00
Tank City	-1000.86	6.52
Tank WilletTank	4892.20	7.23
Tank FishTank	-5197.70	6.32
Tank Steamboat2	-419.62	3.92

SCENARIO 2 - WITH WSSA DEVELOPMENT

Node ID	Demand GPM	Pressure psi
Tank ElkTank	-586.55	6.54
Tank North	-3936.36	7.37
Tank Skyline	-54.41	4.40



CITY OF STEAMBOAT SPRINGS
ROUTT COUNTY, COLORADO

WASTEWATER TREATMENT FACILITIES
PROPOSED EXPANSION

McLaughlin Water Engineers, Ltd.
2300 15th Street, Suite 220
Denver, Colorado 80202
T 303.964.3333
F 303.964.3355

FIG. IV-A

P:\PROJECTS\STEAMBOAT SPRINGS\09-12.01 W&WW M P. RATE STUDIES\DRAWINGS\SEWER MASTER PLAN\STEAMBOAT WWTP MASTERPLAN.DWG Last Saved: 12/8/2009 3:08 PM

CITY OF STEAMBOAT SPRINGS, CO
Prepared by MWE
October 26, 2009

EXISTING AND ULTIMATE SEWER SYSTEM MODEL

DRAFT

	SUB	Manhole		Length	Invert Elevations		Pipe	Pipe	Pipe	Mannings	Q(full)	Q(full)	*Q(Allow)	*Q(Allowable)	Area	Existing	Existing	Existing Q-Ave	Existing Q-Cumm.	PEAK	Domestic	I & I	I & I Cumm.	Existing **IPF	Existing	Percent	Proposed	Ultimate	Ultimate	Ultimate Q-Ave	Ultimate Q-Cumm.	PEAK	Domestic	Ultimate IPF	Ultimate	Percent
REACH	REACH	U/S	D/S	(ft.)	OUT	IN	Slope	Diam. (in.)	Diam (ft.)	n	(cfs)	(gpd)	(cfs)	(gpd)	(acres)	(EQR)	(Cum. EQR)	(gpd)	(gpd)	FACTOR	Peak Flow (gpd)	(gpd)		(gpd)	Excess Capacity	Capacity	(EQR)	(EQR)	(Cum. EQR)	(gpd)	(gpd)	FACTOR	Peak Flow (gpd)	(gpd)	Excess Capacity	Capacity
Y BASIN TRUNK																																				
Y	Y-2	107.9	107.8	388	6778.00	6775.00	0.0077	15	1.25	0.013	5.695	3,680,834	4.77	2,576,584		33	33	9,212	9,212	5.13	47282	10,000	10,000	57,282	2,519,302	2%	2	35	35	9772	9,772	5.08	49685	59,685	2,516,899	2%
Y	Y-1	107.8	107.7	130	6775.00	6772.40	0.0200	8	0.67	0.013	1.714	1,107,422	0.86	553,711		17	50	4,760	13,972	4.80	67090	10,000	20,000	87,090	466,621	8%	2	19	54	5320	15,092	4.74	71579	91,579	462,132	8%
Y		107.7	107.6	280	6772.20	6769.30	0.0104	8	0.67	0.013	1.233	796,926	0.62	398,463		17	67	4,760	18,732	4.58	85824	10,000	30,000	115,824	282,639	15%	2	19	73	5320	20,412	4.52	92245	122,245	276,218	15%
Y		107.6	107.5	300	6769.30	6760.50	0.0293	8	0.67	0.013	2.075	1,341,155		670,577		17	84	4,760	23,492	4.42	103804		30,000	133,804	536,774	10%	2	19	92	5320	25,732	4.35	112057	142,057	528,521	11%
Y		107.5	107.4	230	6759.90	6757.00	0.0126	8	0.67	0.013	1.361	879,292		439,646		17	101	4,760	28,252	4.29	121205		30,000	151,205	288,441	17%	2	19	111	5320	31,052	4.23	131218	161,218	278,428	18%
Y		107.4	107.3	233	6755.00	6749.20	0.0249	8	0.67	0.013	1.912	1,235,476		617,738		17	118	4,760	33,012	4.18	138141		30,000	168,141	449,596	14%	2	19	130	5320	36,372	4.12	149859	179,859	437,878	15%
Y		107.3	107.2	172	6749.00	6747.30	0.0099	8	0.67	0.013	1.205	778,500		389,250		17	135	4,760	37,772	4.10	154690		30,000	184,690	204,560	24%	2	19	149	5320	41,692	4.03	168068	198,068	191,182	25%
Y		107.2	107.1	194	6747.20	6738.00	0.0474	8	0.67	0.013	2.639	1,705,262		852,631		17	152	4,760	42,532	4.02	170907		30,000	200,907	651,724	12%	2	19	168	5320	47,012	3.95	185907	215,907	636,724	13%
Y		107.1	107	127	6738.00		0.0100	8	0.67	0.013	1.212	783,066		391,533		17	169	4,760	47,292	3.95	186836		30,000	216,836	174,696	28%	2	19	187	5320	52,332	3.89	203425	233,425	158,108	30%
	Mt. Wern	112	111	236			0.0033	18	1.50	0.013	6.051	3,910,286		2,737,200		6704	6704	1,877,120	1,877,120	2.19	4115031	1,000,000	1,030,000	5,145,031	-2,407,831	132%	3223	9927	9927	2779560	2,779,560	2.06	5722419	6,752,419	-4,015,220	173%
		111	110	400			0.0036	18	1.50	0.013	6.320	4,084,160		2,858,912			6704	0	1,877,120	2.19	4115031		1,030,000	5,145,031	-2,286,119	126%	2	2	9929	560	2,780,120	2.06	5723388	6,753,388	-3,894,476	165%
		110	109	378			0.0033	18	1.50	0.013	6.051	3,910,286		2,737,200			6704	0	1,877,120	2.19	4115031		1,030,000	5,145,031	-2,407,831	132%	2	2	9931	560	2,780,680	2.06	5724356	6,754,356	-4,017,156	173%
		109	108	125			0.0038	18	1.50	0.013	6.493	4,196,076		2,937,253			6704	0	1,877,120	2.19	4115031		1,030,000	5,145,031	-2,207,778	123%	2	2	9933	560	2,781,240	2.06	5725325	6,755,325	-3,818,072	161%
		108	107	220			0.0028	18	1.50	0.013	5.573	3,601,891		2,521,323			6704	0	1,877,120	2.19	4115031		1,030,000	5,145,031	-2,623,708	143%	2	2	9935	560	2,781,800	2.06	5726293	6,756,293	-4,234,970	188%
Y	Y-2,Y-1	107	106	247			0.0027	18	1.50	0.013	5.473	3,536,986		2,475,890		17	6890	4,760	1,881,880	2.19	4123795		1,030,000	5,153,795	-2,677,904	146%	2	206	10141	57652	2,891,784	2.05	5915877	6,945,877	-4,469,986	196%
Y		106	105	133			0.0034	18	1.50	0.013	6.142	3,969,090		2,778,363		17	6907	4,760	1,886,640	2.19	4132555		1,030,000	5,162,555	-2,384,191	130%	2	19	10160	5320	2,897,104	2.05	5925017	6,955,017	-4,176,654	175%
Y		105	104A	225			0.0029	18	1.50	0.013	5.672	3,665,646		2,565,952		17	6924	4,760	1,891,400	2.19	4141311		1,030,000	5,171,311	-2,605,359	141%	2	19	10179	5348	2,902,452	2.04	5934204	6,964,204	-4,398,252	190%
Y		104A	104	68			0.0029	18	1.50	0.013	5.672	3,665,646		2,565,952		17	6941	4,760	1,896,160	2.19	4150064		1,030,000	5,180,064	-2,614,112	141%		17	10196	4760	2,907,212	2.04	5942377	6,972,377	-4,406,425	190%
Y		104	103	200			0.0027	18	1.50	0.013	5.473	3,536,986		2,475,890		21	6962	5,880	1,902,040	2.19	4160872		1,030,000	5,190,872	-2,714,981	147%		21	10217	5880	2,913,092	2.04	5952472	6,982,472	-4,506,581	197%
Y		103	102	209			0.0038	18	1.50	0.013	6.493	4,196,076		2,937,253			6962	0	1,902,040	2.19	4160872		1,030,000	5,190,872	-2,253,619	124%			10217		2,913,092	2.04	5952472	6,982,472	-4,045,219	166%
Y		102	101	156			0.0070	18	1.50	0.013	8.812	5,695,089		3,986,562			6962	0	1,902,040	2.19	4160872		1,030,000	5,190,872	-1,204,309	91%			10217	0	2,913,092	2.04	5952472	6,982,472	-2,995,909	123%
Y		101	100	450			0.0072	18	1.50	0.013	8.937	5,775,875		4,043,112			6962	0	1,902,040	2.19	4160872		1,030,000	5,190,872	-1,147,759	90%			10217	0	2,913,092	2.04	5952472	6,982,472	-2,939,359	121%
Y		100	99	436			0.0068	18	1.50	0.013	8.685	5,613,141		3,929,199			6962	0	1,902,040	2.19	4160872		1,030,000	5,190,872	-1,261,673	92%			10217	0	2,913,092	2.04	5952472	6,982,472	-3,053,273	124%
Y		99	98	450			0.0085	18	1.50	0.013	9.711	6,275,683		4,392,978			6962	0	1,902,040	2.19	4160872		1,030,000	5,190,872	-797,894	83%			10217	0	2,913,092	2.04	5952472	6,982,472	-2,589,494	111%
Y		98	97	153			0.0095	18	1.50	0.013	10.266	6,634,578		4,644,205			6962	0	1,902,040	2.19	4160872		1,030,000	5,190,872	-546,667	78%			10217	0	2,913,092	2.04	5952472	6,982,472	-2,338,267	105%
Y		97	96	420			0.0105	18	1.50	0.013	10.793	6,975,031		4,882,522			6962	0	1,902,040	2.19	4160872		1,030,000	5,190,872	-308,350	74%			10217	0	2,913,092	2.04	5952472	6,982,472	-2,099,950	100%
X BASIN TRUNK																																				
X	X-2	96.15.26	96.15.25	370	7018.70	6995.00	0.0641	8	0.67	0.013	3.067	1,981,853	1.54	990,926		63	63	17,500	17,500	4.63	81057	1,000	1,000	82,057	908,869	4%	18	80	80	22400	22,400	4.45	99735	100,735	890,191	5%
X	Mt. Wern	96.15.25	96.15.24	180	6995.00	6980.00	0.0833	8	0.67	0.013	3.498	2,260,516	1.76	1,130,258		67	130	18,760	36,260	4.12	149472	1,000	2,000	151,472	978,786	7%	33	100	180	28000	50,400	3.91	197098	199,098	931,160	9%
X		96.15.24	96.15.23	402	6980.00	6974.50	0.0137	8	0.67	0.013	1.417	915,939	0.71	457,969			130	0	36,260	4.12	149472	1,000	3,000	152,472	305,498	17%			180	0	50,400	3.91	197098	200,098	257,872	22%
X		96.15.23	96.15.22	173	6974.50	6971.00	0.0202	8	0.67	0.013	1.723	1,113,805		556,902			130	0	36,260	4.12	149472	1,000	4,000	153,472	403,431	14%			180	0	50,400	3.91	197098	201,098	355,805	18%
X		96.15.22	96.15.21	200	6970.80	6959.75	0.0553	8	0.67	0.013	2.848	1,840,621		920,310		4	134	1,120	37,380	4.10	153340	1,000	5,000	158,340	761,970	9%	2	6	186	1540	51,940	3.89	202144	207,144	713,166	11%
X		96.15.21	96.15.20	274	6959.75	6955.00	0.0173	8	0.67	0.013	1.595	1,031,026		515,513		4	138	1,120	38,500	4.08	157191	1,000	6,000	163,191	352,322	16%	2	6	192	1680	53,620	3.87	207622	213,622	301,891	21%
X		96.15.20	96.15.19	191	6955.00	6951.70	0.0173	8	0.67	0.013	1.593	1,029,292		514,646		5	143	1,400	39,900	4.06	161978	1,000	7,000	168,978	345,667	16%	1	6	198	1680	55,300	3.85	213073	220,073	294,573	21%
X		96.15.19	96.15.18	231	6951.70	6951.70	0.0074	8	0.67	0.013	1.042	673,618		336,809		5	148	1,400	41,300	4.04	166739	1,000	8,000	174,739	162,070	26%	1	6	204	1680	56,980	3.83	218498	226,498	110,312	34%
X		96.15.18	96.15.17	98	6951.70	6950.70	0.0102	8	0.67	0.013	1.224	791,016		395,508		5	153	1,400	42,700	4.02	171474	1,000	9,000	180,474	215,033	23%	1	6	210	1680	58,660	3.82	223896	232,896	162,611	29%
X		96.15.17	96.15.16	100	6950.40	6943.00	0.0740	8	0.67	0.013	3.296	2,130,169		1,065,084		5	158	1,400	44,100	4.00	176185	1,000	10,000	186,185	878,900	9%	2	7	217	1960	60,620	3.80	230164	240,164	824,920	11%
X		96.15.16	96.15.15.1	76	6943.00	6941.20	0.0237	8	0.67	0.013	1.865	1,205,112		602,556		5	163	1,400	45,500	3.98	180871		10,000	190,871	411,685	16%	2	7	224	1960	62,580	3.78	236399	246,399	356,157	20%
X		96.15.15.1	96.15.15	197	6941.20	6936.50	0.0239	8	0.67	0.013	1.872	1,209,522		604,761		5	168	1,400	46,900	3.96	185535		10,000	195,535	409,227	16%	2	7	231	1960	64,540	3.76	242603	252,603	352,158	21%
X		96.15.15	96.15.14	225	6936.50	6931.00	0.0244	8	0.67	0.013	1.894	1,224,301		612,151		6	174	1,680	48,580	3.93	191102		10,000	201,102	411,049	16%	1	7	238	1960	66,500	3.74	248777	258,777	353,374	21%
X		96.15.14	96.15.13	378	6930.80	6928.00	0.0074	8	0.67	0.013	1.043	673,956		336,978		6	180	1,680	50,260	3.91	196638		10,000	206,638	130,340	31%	1	7	245	1960	68,460	3.72	254922	264,922	72,056	39%
X		96.15.13	96.15.12	406	6928.00	6909.00	0.0468	8	0.67	0.013	2.621	1,693,994		846,997		6	186	1,680	51,940	3.89	202144		10,000	212,144	634,853	13%	1	7	252	1960	70,420	3.71	261038	271,038	575,959	16%
X		96.15.12	96.15.11	283	6908.70	6888.50	0.0714	8	0.67	0.013	3.237	2,092,091		1,046,046		6	192	1,680	53,620	3.87	207622		10,000	217,622	828,423	10%	1	7	259	1960	72,380	3.69	267128	277,128	768,918	13%
X	X-1	96.15.11	96.15.10	138	6888.50	6882.50	0.0435	8	0.67	0.013	2.526	1,632,805		816,402		8	200	2,240	55,860	3.85	214884		10,000	224,884	591,518	14%	2	10	268	2660	75,040	3.67	275350	285,350	531,052	17%
X		96.15.10	96.15.9A	46	6882.50	6882.46	0.0040	8	0.67	0.013	0.766	495,254		247,627		8	208	2,240	58,100	3.82	222100		10,000	232,100	15,527	47%	2	10	278	2800	77,840	3.65	283955	293,955	-46,328	59%
X		96.15.9A	96.15.9	279	6882.46	6880.50	0.0070	8	0.67	0.013	1.016	656,333		328,166		8	216	2,240	60,340	3.80	229271		10,000	239,271	88,896	36%	2	10	288	2800	80,640	3.63	292511	302,511	25,655	46%
X		96.15.9	96.15.8	231	6880.50	6874.80	0.0247	8	0.67	0.013	1.903	1,230,069		615,035			216	0	60,340	3.80	229271		10,000	239,271	375,764	19%			288	0	80,640	3.63	292511	302,511	312,524	25%
X		96.15.8	96.15.7	244	6874.30	6872.00	0.0094	8	0.67	0.013	1.176	760,269		380,134			216	0	60,340	3.80	229271		10,000	239,271	140,864	31%			288	0	80,640	3.63	292511	302,511	77,623	40%
X		96.15.7	96.15.6	401	6872.00	6870.00	0.0050	8	0.67	0.013	0.856	553,020		276,510		4	220	1,120	61,460	3.79	232840		10,000	242,840	33,670	44%	1	5	293	1400	82,040	3.62	296771	306,771	-30,261	55%
X		96.15.6	96.15.5	202	6869.80	6843.70	0.1292	8	0.67	0.013	4.355	2,814,769		1,407,384		4	224	1,120	62,580	3.78	236399		10,000	246,399	1,160,985	9%	1	5	298	1400	83,440	3.61	301019	311,019	1,096,365	11%
X		96.15.5	96.15.3	150	6837.60	6823.69	0.0927	8	0.67	0.013	3.690	2,384,603		1,192,301		4	228	1,120	63,700	3.77	239948		10,000	249,948	942,354	10%	1	5	303	1400	84,840	3.60	305256	315,256	877,045	13%
X		96.15.3	96.15.2	277	6823.62	6808.00	0.0565	8	0.67	0.013	2.880	1,861,192		930,596		4	232	1,120	64,820	3.76	243487		10,000	253,487	677,109	14%	1	5	308	1400	86,240	3.59	309482	319,482	611,114	17%
X		96.15.2	96.15.1	215	6808.00	6799.00	0.0419	8	0.67	0.013	2.479	1,602,139		801,069		4	236	1,120	65,940	3.75	247016		10,000	257,016	544,054	16%	1	5	313	1400	87,640	3.58	313697	323,697	477,373	20%
X		96.15.1	96.15	130	6793.50	6788.50	0.0385	8	0.67	0.013	2.376	1,535,718		767,859		5	241	1,400	67,340	3.73	251414		10,000	261,414	506,445	17%		5	318	1400	89,040	3.57	317901	327,901	439,958	21%
W BASIN TRUNK																																				
W	W	96.7.15	96.7.14	197	6897.24	6891.17	0.0308	8	0.67	0.013	2.127	1,374,546		687,273		5	5	1,509	1,509	6.86	10346		0	10,346	676,927	1%	2	8	8	2153	2,153	6.48	13945	13,945	673,328	1%
W		96.7.14	96.7.13	249	6890.97	6878.39	0.0505	8	0.67	0.013	2.723	1,760,106		880,053		5	11	1,509	3,018	6.14	18520		0	18,520	861,532	1%	2	8	15	2181	4,334	5.79	25099	25,099	854,954	1%
W		96.7.13	96.7.12	83	6878.27	6873.01	0.0634	8	0.67	0.013	3.050	1,971,296		985,648		5	16	1,509	4,528	5.75	26036		0	26,036	959,613	1%	2	8	23	2153	6,488	5.43	35220	35,220	950,428	2%
W		96.7.12	96.7.11	107	6872.83	6865.75	0.0662	8	0.67	0.013	3.117	2,014,294		1,007,147		5	22	1,509	6,037	5.49	33153		0	33,153	973,994	2%	2	8	31	2153	8,641	5.19	44807	44,807	962,340	2%
W		96.7.11	96.7.10	310	6865.65	6848.30	0.0560	8	0.67	0.013	2.866	1,852,538		926,269			22	0	6,037	5.49	33153		0	33,153	893,116	2%	8	8	39	2184	10,825	5.00	54144	54,144	872,124	3%
W		96.7.10	96.7.9A	141	6848.17	6839.56	0.0611	8	0.67	0.013	2.994	1,935,041		967,520			22	0	6,037	5.49	33153		0	33,153	934,368	2%	8	8	46	2156	12,981	4.86	63069	63,069	904,452	3%
W		96.7.9A	96.7.9	31	6839.46	6837.47	0.0642	8	0.67	0.013	3.070	1,984,010		992,005		50	72	14,000	20,037	4.53	90819		0	90,819	901,186	5%	35	85	131	23800	36,781	4.11	151273	151,273	840,732	8%
W		96.7.9	96.7.8	257	6835.59	6833.25	0.0091	8	0.67	0.013	1.156	747,205		373,602			72	0	20,037	4.53	90819		0	90,819	282,783	12%	5	5	136	1260	38,041	4.09	155614	155,614	217,988	21%
W		96.7.8	96.7.7	300	6833.25	6821.60	0.0388	8	0.67	0.013	2.388	1,543,123		771,561			72	0	20,037	4.53	90819		0	90,819	680,743	6%			136	0	38,041	4.09	155614	155,614	615,947	10%
W		96.7.7	96.7.6.1	84	6821.60	6793.50	0.3345	8	0.67	0.013	7.008	4,529,097		2,264,549			72	0	20,037	4.53	90819		0	90,819	2,173,730	2%			136	0	38,041	4.09	155614	155,614	2,108,934	3%
W		96.7.6.1	96.7.6	41	6793.39	6783.78	0.2344	8	0.67	0.013	5.866	3,791,123		1,895,562		50	122	14,000	34,037	4.16	141735		0	141,735	1,753,827	4%	35	85	221	23800	61,841	3.78	234051	234,051	1,661,510	6%
W		96.7.6	96.7.5	94	6783.74		0.0050	8	0.67	0.013	0.857	553,711		276,855		5	127	1,509	35,546	4.14	146995		0	146,995	129,860	27%	2	8	229	2153	63,994	3.76	240878	240,878	35,978	44%
W		96.7.5	96.7.4	64			0.0050	8	0.67	0.013	0.857	553,711		276,855		5	132	1,509	37,055	4.11	152220		0	152,220	124,635	27%	2	8	236	2181	66,175	3.74	247756	247,756	29,100	45%
W		96.7.4	96.7.3	58			0.0050	8	0.67	0.013	0.857	553,711		276,855		5	138	1,509	38,564	4.08	157412		0	157,412	119,444	28%	2	8	244	2153	68,328	3.72	254510	254,510	22,345	46%
W		96.7.3	96.7.2	237			0.0050	12	1.00	0.013	2.526	1,632,525		816,262		5	143	1,509	40,074	4.06	162570		0	162,570	653,692	10%	2	8	252	2153	70,482	3.71	261230	261,230	555,032	16%
W		96.7.2	96.7.1	382			0.0050	12	1.00	0.013	2.526	1,632,525		816,262		5	149	1,509	41,583	4.03	167698		0	167,698	648,565	10%	2	8	259	2153	72,635	3.69	267918	267,918	548,345	16%
W		96.7.1	96.7	444			0.0050	12	1.00	0.013	2.526	1,632,525		816,262		5	154	1,509	43,092	4.01	172796		0	172,796	643,467	11%	3	8	267	2209	74,844	3.67	274746	274,746	541,516	17%
V BASIN TRUNK																																				
V	V-3	96.48.20	96.48.19	401			0.0050	8	0.67	0.013	0.857	553,711		276,855		1	1	280	280	8.98	2513		0	2,513	274,342	0%	4	5	5	1400	1,400	6.94	9714	9,714	267,142	2%
V		96.48.19	96.48.18	404			0.0050	8	0.67	0.013	0.857	553,711		276,855			1	0	280	8.98	2513		0	2,513	274,342	0%			5	0	1,400	6.94	9714	9,714	267,142	2%
V		96.48.18	96.48.17	402			0.0050	8	0.67	0.013	0.857	553,711		276,855		1	2	280	560	8.03	4499		0	4,499	272,356	1%	4	5	10	1400	2,800	6.21	17388	17,388	259,467	3%
V		96.48.17	96.48.16	400			0.0050	8	0.67	0.013	0.857	553,711		276,855			2	0	560	8.03	4499		0	4,499	272,356	1%			10	0	2,800	6.21	17388	17,388	259,467	3%
V		96.48.16	96.48.15	386			0.0050	8	0.67	0.013	0.857	553,711		276,855		1	3	280	840	7.53	6325		0	6,325	270,531	1%	4	5	15	1400	4,200	5.82	24444	24,444	252,412	4%
V		96.48.15	96.48.14	237			0.0050	8	0.67	0.013	0.857	553,711		276,855			3	0	840	7.53	6325		0	6,325	270,531	1%			15	0	4,200	5.82	24444	24,444	252,412	4%
V		96.48.14	96.48.13	202			0.0050	8	0.67	0.013	0.857	553,711		276,855		1	4	280	1,120	7.19	8053		0	8,053	268,802	1%	4	5	20	1400	5,600	5.56	31126	31,126	245,730	6%
V		96.48.13	96.48.12	109			0.0050	8	0.67	0.013	0.857	553,711		276,855			4	0	1,120	7.19	8053		0	8,053	268,802	1%			20	0	5,600	5.56	31126	31,126	245,730	6%
V		96.48.12	96.48.11	132			0.0050	8	0.67	0.013	0.857	553,711		276,855		1	5	280	1,400	6.94	9714		0	9,714	267,142	2%	4	5	25	1400	7,000	5.36	37542	37,542	239,313	7%
V		96.48.11	96.48.10	135			0.0050	8	0.67	0.013	0.857	553,711		276,855			5	0	1,400	6.94	9714		0	9,714	267,142	2%			25	0	7,000	5.36	37542	37,542	239,313	7%
V		96.48.10	96.48.9	233			0.0050	8	0.67	0.013	0.857	553,711		276,855		1	6	280	1,680	6.74	11321		0	11,321	265,534	2%	4	5	30	1400	8,400	5.21	43756	43,756	233,100	8%
V		96.48.9	96.48.8	147			0.0050	8	0.67	0.013	0.857	553,711		276,855			6	0	1,680	6.74	11321		0	11,321	265,534	2%			30	0	8,400	5.21	43756	43,756	233,100	8%
V		96.48.8	96.48.7	93			0.0050	8	0.67	0.013	0.857	553,711		276,855			6	0	1,680	6.74	11321		0	11,321	265,534	2%			30	0	8,400	5.21	43756	43,756	233,100	8%
V		96.48.7	96.48.6	98			0.0050	8	0.67	0.013	0.857	553,711		276,855			6	0	1,680	6.74	11321		0	11,321	265,534	2%			30	0	8,400	5.21	43756	43,756	233,100	8%
V		96.48.6	96.48.5	95			0.0050	8	0.67	0.013	0.857	553,711		276,855			6	0	1,680	6.74	11321		0	11,321	265,534	2%			30	0	8,400	5.21	43756	43,756	233,100	8%
V	V-2	96.48.5	96.48.4	72		7185.70	0.0050	8	0.67	0.013	0.857	553,711		276,855		30	36	8,400	10,080	5.06	50997		0	50,997	225,858	9%	5	35	65	9800	18,200	4.60	83772	83,772	193,083	15%
V		96.48.4	96.48.3	150	7185.30	7179.20	0.0407	8	0.67	0.013	2.443	1,579,128		789,564		5	41	1,400	11,480	4.96	56884		0	56,884	732,680	4%		5	70	1400	19,600	4.55	89153	89,153	700,411	6%
V		96.48.3	96.48.2	158	7179.20	7172.50	0.0424	8	0.67	0.013	2.495	1,612,527		806,263		5	46	1,400	12,880	4.86	62657		0	62,657	743,607	4%		5	75	1400	21,000	4.50	94472	94,472	711,791	6%
V		96.48.2	96.48.1	210	7172.00	7156.00	0.0762	8	0.67	0.013	3.345	2,161,466		1,080,733		5	51	1,400	14,280	4.79	68330		0	68,330	1,012,403	3%		5	80	1400	22,400	4.45	99735	99,735	980,998	5%
V		96.48.1	96.48	142	7156.00	7138.80	0.1211	8	0.67	0.013	4.217	2,725,324		1,362,662		5	56	1,400	15,680	4.71	73915		0	73,915	1,288,747	3%		5	85	1400	23,800	4.41	104946	104,946	1,257,716	4%
V		96.48	96.47	310	7138.80	7109.30	0.0952	8	0.67	0.013	3.738	2,415,618		1,207,809		5	61	1,400	17,080	4.65	79420		0	79,420	1,128,389	3%		5	90	1400	25,200	4.37	110107	110,107	1,097,702	5%
V		96.47	96.46	30	7109.30	7109.00	0.0100	8	0.67	0.013	1.212	783,066		391,533		5	66	1,400	18,480	4.59	84853		0	84,853	306,679	11%		5	95	1400	26,600	4.33	115223	115,223	276,309	15%
V		96.46	96.45	30	7109.00	7107.80	0.0400	8	0.67	0.013	2.423	1,566,131		783,066		5	71	1,400	19,880	4.54	90221		0	90,221	692,844	6%		5	100	1400	28,000	4.30	120296	120,296	662,769	8%
V		96.45	96.44	203	7107.80	7105.25	0.0126	8	0.67	0.013	1.358	877,648		438,824		5	76	1,400	21,280	4.49	95529		0	95,529	343,295	11%		5	105	1400	29,400	4.26	125329	125,329	313,495	14%
V		96.44	96.43	176	7104.50	7084.50	0.1136	8	0.67	0.013	4.085	2,639,713		1,319,857		5	81	1,400	22,680	4.44	100781		0	100,781	1,219,075	4%		5	110	1400	30,800	4.23	130323	130,323	1,189,533	5%
V		96.43	96.42	200	7084.50	7073.00	0.0575	8	0.67	0.013	2.905	1,877,725		938,863		5	86	1,400	24,080	4.40	105982		0	105,982	832,881	6%		5	115	1400	32,200	4.20	135282	135,282	803,581	7%
V		96.42	96.41	92	7073.00	7072.00	0.0109	8	0.67	0.013	1.263	816,402		408,201		5	91	1,400	25,480	4.36	111134		0	111,134	297,067	14%		5	120	1400	33,600	4.17	140205	140,205	267,996	17%
V		96.41	96.40	85	7072.00	7068.00	0.0471	8	0.67	0.013	2.628	1,698,708		849,354		5	96	1,400	26,880	4.32	116241		0	116,241	733,113	7%		5	125	1400	35,000	4.15	145097	145,097	704,257	9%
V		96.40	96.39	115	7068.00	7060.00	0.0696	8	0.67	0.013	3.196	2,065,353		1,032,676		5	101	1,400	28,280	4.29	121306		0	121,306	911,370	6%		5	130	1400	36,400	4.12	149956	149,956	882,720	7%
V		96.39	96.38	232	7060.00		0.0300	8	0.67	0.013	2.099	1,356,309		678,155		5	106	1,400	29,680	4.26	126331		0	126,331	551,824	9%		5	135	1400	37,800	4.09	154786	154,786	523,368	11%
V		93.38	96.37	68		7051.00	0.0300	8	0.67	0.013	2.099	1,356,309		678,155		5	111	1,400	31,080	4.23	131318		0	131,318	546,837	10%		5	140	1400	39,200	4.07	159588	159,588	518,567	12%
V		96.37	96.36	204	7051.00	7042.50	0.0417	8	0.67	0.013	2.473	1,598,426		799,213		5	116	1,400	32,480	4.20	136269		0	136,269	662,944	9%		5	145	1400	40,600	4.05	164362	164,362	634,851	10%
V		96.36	96.35	199	7042.50	7025.00	0.0879	8	0.67	0.013	3.593	2,322,152		1,161,076		5	121	1,400	33,880	4.17	141186	5,000	5,000	146,186	1,014,890	6%		5	150	1400	42,000	4.03	169110	174,110	986,966	7%
V		96.35	96.34	80	7022.00	7021.50	0.0063	8	0.67	0.013	0.958	619,068		309,534		6	127	1,540	35,420	4.14	146558	5,000	10,000	156,558	152,976	25%		6	156	1540	43,540	4.00	174303	184,303	125,230	30%
V		96.34	96.33	72	7021.50	7021.00	0.0069	8	0.67	0.013	1.010	652,555		326,277		40	167	11,200	46,620	3.96	184604	5,000	15,000	199,604	126,674	31%		40	196	11200	54,740	3.86	211259	226,259	100,018	35%
V		96.33	96.32	190	7021.00	7019.00	0.0105	8	0.67	0.013	1.243	803,408		401,704		6	173	1,680	48,300	3.94	190176	5,000	20,000	210,176	191,528	26%		6	202	1680	56,420	3.84	216692	236,692	165,012	29%
V	V-4	96.32	96.31	220	7019.00	7005.00	0.0636	8	0.67	0.013	3.057	1,975,381		987,690		70	243	19,600	67,900	3.73	253169	5,000	25,000	278,169	709,521	14%	3	73	275	20440	76,860	3.66	280949	305,949	681,741	15%
V		96.31	96.30	158	7005.00	7002.00	0.0190	8	0.67	0.013	1.670	1,079,022		539,511			243	0	67,900	3.73	253169	5,000	30,000	283,169	256,342	26%		0	275	0	76,860	3.66	280949	310,949	228,561	29%
V		96.30	96.29	320	7002.00	6968.00	0.1063	8	0.67	0.013	3.950	2,552,481		1,276,241			243	0	67,900	3.73	253169	5,000	35,000	288,169	988,072	11%		0	275	0	76,860	3.66	280949	315,949	960,291	12%
V		96.29	96.28	226	6967.50	6952.00	0.0686	8	0.67	0.013	3.173	2,050,736		1,025,368			243	0	67,900	3.73	253169	5,000	40,000	293,169	732,199	14%		0	275	0	76,860	3.66	280949	320,949	704,419	16%
V	V-1	96.28	96.27	135	6952.00	6941.00	0.0815	8	0.67	0.013	3.459	2,235,258		1,117,629		6	249	1,680	69,580	3.71	258420	5,000	45,000	303,420	814,208	14%		6	281	1680	78,540	3.64	286099	331,099	786,530	15%
V		96.27	96.26	254	6940.80	6932.00	0.0346	8	0.67	0.013	2.255	1,457,547		728,774		6	255	1,680	71,260	3.70	263652	5,000	50,000	313,652	415,122	22%		6	287	1680	80,220	3.63	291231	341,231	387,543	23%
V		96.26	96.25	163	6932.00	6918.00	0.0859	8	0.67	0.013	3.551	2,294,924		1,147,462		6	261	1,680	72,940	3.69	268863		50,000	318,863	828,599	14%		6	293	1680	81,900	3.62	296345	346,345	801,117	15%
V		96.25	96.24	228	6917.00	6913.00	0.0175	8	0.67	0.013	1.605	1,037,196		518,598		6	267	1,680	74,620	3.67	274055		50,000	324,055	194,543	31%	1	7	300	1960	83,860	3.60	302291	352,291	166,306	34%
V		96.24	96.23	156	6913.00	6904.00	0.0577	8	0.67	0.013	2.910	1,880,863		940,431		6	273	1,680	76,300	3.66	279229		50,000	329,229	611,202	18%	1	7	307	1960	85,820	3.59	308215	358,215	582,216	19%

REACH	SUB REACH	Manhole U/S	Manhole D/S	Length (ft.)	Invert Elevations OUT	Invert Elevations IN	Pipe Slope	Pipe Diam. (in.)	Pipe Diam (ft.)	Mannings n	Q(full) (cfs)	Q(full) (gpd)	*Q(Allow) (cfs)	*Q(Allowable) (gpd)	Area (acres)	Existing (EQR)	Existing (Cum. EQR)	Existing Q-Ave (gpd)	Existing Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	I & I (gpd)	I & I Cumm.	Existing **IPF (gpd)	Existing Excess Capacity	Percent Capacity	Proposed (EQR)	Ultimate (EQR)	Ultimate (Cum. EQR)	Ultimate Q-Ave (gpd)	Ultimate Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	Ultimate IPF (gpd)	Ultimate Excess Capacity	Percent Capacity
V		96.23	96.22	196	6904.00	6890.50	0.0689	8	0.67	0.013	3.180	2,055,119		1,027,559		6	279	1,680	77,980	3.65	284384		50,000	334,384	693,175	16%	1	7	314	1960	87,780	3.58	314117	364,117	663,442	18%
V		96.22	96.20	396	6890.50	6861.85	0.0723	8	0.67	0.013	3.259	2,106,264		1,053,132		6	285	1,680	79,660	3.63	289522		50,000	339,522	713,610	16%	1	7	321	1960	89,740	3.57	319999	369,999	683,133	18%
V		96.20	96.19.A	234	6861.85		0.0722	8	0.67	0.013	3.256	2,104,199		1,052,100		50	335	14,000	93,660	3.54	331700		50,000	381,700	670,400	18%	10	60	381	16800	106,540	3.47	369616	419,616	632,484	20%
V		96.19.A	96.19	124		6836.00	0.0722	8	0.67	0.013	3.256	2,104,102		1,052,051		6	341	1,680	95,340	3.53	336691		50,000	386,691	665,360	18%	1	7	388	1960	108,500	3.46	375319	425,319	626,732	20%
V		96.19	96.18	123	6836.00	6831.50	0.0366	8	0.67	0.013	2.318	1,497,793		748,897		6	347	1,680	97,020	3.52	341667		50,000	391,667	357,229	26%	1	7	395	1960	110,460	3.45	381006	431,006	317,890	29%
V		96.18	96.17	183	6831.50	6821.00	0.0574	8	0.67	0.013	2.902	1,875,717		937,858		6	352	1,540	98,560	3.51	346217		50,000	396,217	541,641	21%	2	7	402	1960	112,420	3.44	386677	436,677	501,181	23%
V		96.17	96.16B	138	6821.00		0.0720	8	0.67	0.013	3.251	2,101,185		1,050,593			352	0	98,560	3.51	346217		50,000	396,217	654,376	19%	7	7	409	1960	114,380	3.43	392332	442,332	608,261	21%
V		96.16B	96.16A	76		6806.62	0.0720	8	0.67	0.013	3.251	2,101,185		1,050,593			352	0	98,560	3.51	346217		50,000	396,217	654,376	19%	7	7	416	1960	116,340	3.42	397972	447,972	602,621	21%
V		96.16A	96.16	29	6806.42	6804.34	0.0717	8	0.67	0.013	3.245	2,097,156		1,048,578			352	0	98,560	3.51	346217		50,000	396,217	652,361	19%	7	7	423	1960	118,300	3.41	403596	453,596	594,982	22%
U BASIN TRUNK																																				
U	U	96.5.4	96.5.3	394	6723.12	6721.68	0.0037	8	0.67	0.013	0.733	473,403		236,702		24	24	6,720	6,720	5.40	36277		0	36,277	200,425	8%	35	59	59	16520	16,520	4.67	77227	77,227	159,475	16%
U		96.5.3	96.5.2	332	6721.53	6720.22	0.0039	8	0.67	0.013	0.761	491,886		245,943		24	48	6,720	13,440	4.83	64937		0	64,937	181,006	13%		24	83	6720	23,240	4.43	102867	102,867	143,076	21%
U		96.5.2	96.5.1	38	6720.07	6719.90	0.0045	8	0.67	0.013	0.810	523,758		261,879		24	72	6,720	20,160	4.53	91288		0	91,288	170,591	17%		24	107	6720	29,960	4.25	127331	127,331	134,548	24%
U		96.5.1	96.5	324	6719.74	6717.50	0.0069	8	0.67	0.013	1.007	651,103		325,551		71	143	19,796	39,956	4.06	162169		0	162,169	163,382	25%		71	178	19796	49,756	3.92	194980	194,980	130,571	30%
T-2 to T-1 BASIN TRUNK																																				
T	T-2	96.8.14	96.8.13	147			0.0050	8	0.67	0.013	0.857	553,711		276,855		40	40	11,200	11,200	4.97	55716		0	55,716	221,139	10%		40	40	11200	11,200	4.97	55716	55,716	221,139	10%
T		96.8.13	96.8.12	125			0.0050	8	0.67	0.013	0.857	553,711		276,855		7	47	1,960	13,160	4.85	63799		0	63,799	213,056	12%		7	47	1960	13,160	4.85	63799	63,799	213,056	12%
T		96.8.12	96.8.11	287			0.0050	8	0.67	0.013	0.857	553,711		276,855		7	54	1,960	15,120	4.74	71691		0	71,691	205,165	13%		7	54	1960	15,120	4.74	71691	71,691	205,165	13%
T		96.8.11	96.8.10	149			0.0050	8	0.67	0.013	0.857	553,711		276,855		41	95	11,480	26,600	4.33	115223		0	115,223	161,632	21%		41	95	11480	26,600	4.33	115223	115,223	161,632	21%
T		96.8.10	96.8.9	277			0.0050	8	0.67	0.013	0.857	553,711		276,855			95	0	26,600	4.33	115223		0	115,223	161,632	21%	6	6	101	1736	28,336	4.29	121508	121,508	155,348	22%
T		96.8.9	96.8.8	40			0.0050	8	0.67	0.013	0.857	553,711		276,855		5	100	1,400	28,000	4.30	120296		0	120,296	156,559	22%	1	6	107	1736	30,072	4.25	127731	127,731	149,125	23%
T		96.8.8	96.8.7	143			0.0050	8	0.67	0.013	0.857	553,711		276,855		6	106	1,680	29,680	4.26	126331		0	126,331	150,525	23%	2	8	115	2128	32,200	4.20	135282	135,282	141,574	24%
T		96.8.7	96.8.6	153	6870.60	6847.00	0.1542	8	0.67	0.013	4.759	3,075,448		1,537,724		6	112	1,680	31,360	4.22	132311		0	132,311	1,405,413	4%		6	121	1680	33,880	4.17	141186	141,186	1,396,538	5%
T		96.8.6	96.8.5	153	6847.00	6833.00	0.0915	8	0.67	0.013	3.665	2,368,735		1,184,367		6	118	1,680	33,040	4.18	138240		0	138,240	1,046,127	6%		6	127	1680	35,560	4.14	147044	147,044	1,037,323	6%
T	T-1	96.8.5	96.8.4.1	142	6833.00	6819.38	0.0959	8	0.67	0.013	3.753	2,425,172		1,212,586		111	229	31,024	64,064	3.76	241099		0	241,099	971,487	10%		111	238	31024	66,584	3.74	249041	249,041	963,545	10%
T		96.8.4.1	96.8.4	158	6819.05	6808.50	0.0668	8	0.67	0.013	3.131	2,023,466		1,011,733		6	235	1,680	65,744	3.75	246399		0	246,399	765,334	12%		6	244	1680	68,264	3.73	254308	254,308	757,424	13%
T		96.8.4	96.8.3	264	6808.50	6785.90	0.0856	8	0.67	0.013	3.545	2,291,133		1,145,567		6	241	1,680	67,424	3.73	251677		0	251,677	893,889	11%		6	250	1680	69,944	3.71	259555	259,555	886,011	11%
T		96.8.3	96.8.2	239	6785.90	6762.90	0.0962	8	0.67	0.013	3.759	2,429,199		1,214,599		6	247	1,680	69,104	3.72	256935	3,000	3,000	259,935	954,665	11%		6	256	1680	71,624	3.70	264782	267,782	946,817	11%
T	T-3	96.8.2	96.8.1	96	6762.90	6761.60	0.0135	8	0.67	0.013	1.410	911,243		455,621		62	309	17,472	86,576	3.59	310494	3,000	6,000	316,494	139,127	35%		62	318	17472	89,096	3.57	318069	324,069	131,553	36%
T		96.8.1	96.8	204	6761.60	6735.70	0.1270	8	0.67	0.013	4.317	2,790,184		1,395,092		12	321	3,360	89,936	3.56	320586	3,000	9,000	329,586	1,065,507	12%		12	330	3360	92,456	3.55	328114	337,114	1,057,978	12%
T-3 BASIN TRUNK																																				
T	T-3	96.8.2.4.14	96.8.2.4.13	99	6930.84	6925.95	0.0494	8	0.67	0.013	2.693	1,740,343		870,172		4	4	1,120	1,120	7.19	8053		0	8,053	862,118	0%	9	13	13	3640	3,640	5.95	21675	21,675	848,496	1%
T		96.8.2.4.13	96.8.2.4.12	146	6925.75	6923.55	0.0150	8	0.67	0.013	1.485	959,929		479,964		4	8	1,120	2,240	6.44	14416		0	14,416	465,548	2%		4	17	1120	4,760	5.70	27154	27,154	452,811	3%
T		96.8.2.4.12	96.8.2.4.11	87	6923.35	6919.56	0.0434	8	0.67	0.013	2.523	1,630,655		815,327		4	12	1,120	3,360	6.03	20266		0	20,266	795,062	1%		4	21	1120	5,880	5.51	32428	32,428	782,900	2%
T		96.8.2.4.11	96.8.2.4.10	59	6919.36	6915.49	0.0658	8	0.67	0.013	3.108	2,008,931		1,004,465		4	16	1,120	4,480	5.76	25806		0	25,806	978,660	1%		4	25	1120	7,000	5.36	37542	37,542	966,923	2%
T		96.8.2.4.10	96.8.2.4.9	177	6915.29	6904.05	0.0635	8	0.67	0.013	3.053	1,973,307		986,653		4	20	1,120	5,600	5.56	31126		0	31,126	955,528	2%		4	29	1120	8,120	5.24	42527	42,527	944,126	2%
T		96.8.2.4.9	96.8.2.4.8	63	6903.85	6900.81	0.0485	8	0.67	0.013	2.668	1,724,254		862,127		4	24	1,120	6,720	5.40	36277		0	36,277	825,850	2%		4	33	1120	9,240	5.13	47403	47,403	814,724	3%
T		96.8.2.4.8	96.8.2.4.7	50	6900.61	6895.47	0.1020	8	0.67	0.013	3.869	2,500,468		1,250,234		4	28	1,120	7,840	5.27	41292		0	41,292	1,208,942	2%		4	37	1120	10,360	5.04	52185	52,185	1,198,050	2%
T		96.8.2.4.7	96.8.2.4.6	135	6895.27	6885.10	0.0753	8	0.67	0.013	3.326	2,149,274		1,074,637		4	32	1,120	8,960	5.16	46193		0	46,193	1,028,444	2%		4	41	1120	11,480	4.96	56884	56,884	1,017,753	3%
T		96.8.2.4.6	96.8.2.4.5	139	6885.00	6880.36	0.0335	8	0.67	0.013	2.217	1,432,767		716,383		4	36	1,120	10,080	5.06	50997		0	50,997	665,386	4%		4	45	1120	12,600	4.88	61511	61,511	654,873	4%
T		96.8.2.4.5	96.8.2.4.4	67	6880.16	6871.86	0.1246	8	0.67	0.013	4.277	2,764,395		1,382,197		3	39	840	10,920	4.99	54544		0	54,544	1,327,653	2%		3	48	840	13,440	4.83	64937	64,937	1,317,260	2%
T		96.8.2.4.4	96.8.2.4.3	242	6871.66	6857.26	0.0594	8	0.67	0.013	2.954	1,908,986		954,493		2	41	672	11,592	4.95	57350		0	57,350	897,143	3%		2	50	672	14,112	4.79	67654	67,654	886,839	4%
T		96.8.2.4.3	96.8.2.4.2	157	6857.06	6850.14	0.0440	8	0.67	0.013	2.542	1,642,952		821,476		3	44	840	12,432	4.89	60821		0	60,821	760,655	4%		3	53	840	14,952	4.75	71021	71,021	750,455	4%
T		96.8.2.4.2	96.8.2.4.1	77	6849.94	6836.16	0.1794	8	0.67	0.013	5.132	3,316,974		1,658,487		3	47	840	13,272	4.84	64255		0	64,255	1,594,232	2%		3	56	840	15,792	4.71	74358	74,358	1,584,129	2%
T		96.8.2.4.1	96.8.2.4	163	6835.96	6806.60	0.1806	8	0.67	0.013	5.149	3,327,483		1,663,742		3	50	840	14,112	4.79	67654		0	67,654	1,596,087	2%		3	59	840	16,632	4.67	77666	77,666	1,586,075	2%
T		96.8.2.4	96.8.2.3	122	6806.49	6802.36	0.0337	8	0.67	0.013	2.226	1,438,409		719,205		3	53	840	14,952	4.75	71021		0	71,021	648,184	5%		3	62	840	17,472	4.63	80948	80,948	638,256	6%
T		96.8.2.3	96.8.2.2	150	6802.16	6800.66	0.0100	8	0.67	0.013	1.211	782,805		391,402		3	56	840	15,792	4.71	74358		0	74,358	317,044	9%		3	65	840	18,312	4.60	84205	84,205	307,197	11%
T		96.8.2.2	96.8.2.1	166	6800.46	6798.81	0.0100	8	0.67	0.013	1.209	781,646		390,823		3	59	840	16,632	4.67	77666		0	77,666	313,156	10%		3	68	840	19,152	4.57	87438	87,438	303,385	11%
T		96.8.2.1	96.8.2	256	6798.61	6762.90	0.1393	8	0.67	0.013	4.523	2,922,932		1,461,466		3	62	840	17,472	4.63	80948		0	80,948	1,380,518	3%		3	71	840	19,992	4.53	90648	90,648	1,370,818	3%
S BASIN TRUNK																																				
S	S	73.12.34	73.12.33	79	7028.20	7027.90	0.0038	8	0.67	0.013	0.747	482,553		241,277		20	20	5,600	5,600	5.56	31126	10,000	10,000	41,126	200,151	9%	2	22	22	6160	6,160	5.47	33720	43,720	197,557	9%
S		73.12.33	73.12.32	402	7027.81	7003.50	0.0605	8	0.67	0.013	2.980	1,925,651		962,825		4	24	1,120	6,720	5.40	36277	10,000	20,000	56,277	906,549	3%		4	26	1120	7,280	5.33	38800	58,800	904,026	3%
S		73.12.32	73.12.31	281	7003.50	6984.75	0.0667	8	0.67	0.013	3.130	2,022,766		1,011,383		4	28	1,120	7,840	5.27	41292	10,000	30,000	71,292	940,091	4%		4	30	1120	8,400	5.21	43756	73,756	937,627	4%
S		73.12.31	73.12.30	222	6984.75	6971.50	0.0597	8	0.67	0.013	2.960	1,913,064		956,532		4	32	1,120	8,960	5.16	46193	10,000	40,000	86,193	870,339	5%		4	34	1120	9,520	5.11	48607	88,607	867,926	5%
S		73.12.30	73.12.29	191	6971.50	6966.00	0.0288	8	0.67	0.013	2.056	1,328,810		664,405		4	36	1,120	10,080	5.06	50997	10,000	50,000	100,997	563,408	8%		4	38	1120	10,640	5.02	53367	103,367	561,038	8%
S		73.12.29	73.12.28	153	6966.00	6962.50	0.0229	8	0.67	0.013	1.833	1,184,367		592,184		4	40	1,120	11,200	4.97	55716	10,000	60,000	115,716	476,467	10%		4	42	1120	11,760	4.94	58047	118,047	474,136	10%
S		73.12.28	73.12.27	329	6962.50	6954.25	0.0251	8	0.67	0.013	1.919	1,240,016		620,008		4	44	1,120	12,320	4.90	60360	10,000	70,000	130,360	489,647	11%		4	46	1120	12,880	4.86	62657	132,657	487,351	11%
S		73.12.27	73.12.26	326	6954.25	6954.25	0.0240	8	0.67	0.013	1.877	1,213,120		606,560		4	48	1,120	13,440	4.83	64937	10,000	80,000	144,937	461,623	12%		4	50	1120	14,000	4.80	67203	147,203	459,357	12%
S		73.12.26	73.12.25	300	6954.25	6938.50	0.0525	8	0.67	0.013	2.776	1,794,229		897,114		4	52	1,120	14,560	4.77	69454	10,000	90,000	159,454	737,661	9%		4	54	1120	15,120	4.74	71691	161,691	735,424	9%
S		73.12.25	73.12.24A	123	6938.50		0.0310	8	0.67	0.013	2.133	1,378,729		689,365		4	56	1,120	15,680	4.71	73915	10,000	100,000	173,915	515,450	13%		4	58	1120	16,240	4.69	76126	176,126	513,239	13%
S		73.12.24A	73.12.24B	157		6930.50	0.0310	8	0.67	0.013	2.133	1,378,729		689,365		4	60	1,120	16,800	4.66	78325	10,000	110,000	188,325	501,040	14%		4	62	1120	17,360	4.64	80512	190,512	498,852	14%
S		73.12.24B	73.12.24	50	6930.00	6928.00	0.0400	8	0.67	0.013	2.423	1,566,131		783,066		4	64	1,120	17,920	4.61	82688	10,000	120,000	202,688	580,377	13%		4	66	1120	18,480	4.59	84853	204,853	578,212	13%
S		73.12.24	73.12.23	212	6928.00	6923.00	0.0236	8	0.67	0.013	1.861	1,202,583		601,292		4	68	1,120	19,040	4.57	87008	10,000	130,000	217,008	384,284	18%		4	70	1120	19,600	4.55	89153	219,153	382,139	18%
S		73.12.23	73.12.22	300	6923.00	6920.25	0.0092	8	0.67	0.013	1.160	749,728		374,864		2	70	560	19,600	4.55	89153	10,000	140,000	229,153	145,711	31%		2	72	560	20,160	4.53	91288	231,288	143,576	31%
S		73.12.22	73.12.21	300	6920.25	6913.50	0.0225	8	0.67	0.013	1.817	1,174,598		587,299			70	0	19,600	4.55	89153	10,000	150,000	239,153	348,146	20%			72	0	20,160	4.53	91288	241,288	346,012	21%
S		73.12.21	73.12.20	69	6913.50	6908.00	0.0797	8	0.67	0.013	3.421	2,210,828		1,105,414			70	0	19,600	4.55	89153	10,000	160,000	249,153	856,261	11%			72	0	20,160	4.53	91288	251,288	854,126	11%
S		73.12.20	73.12.19	177	6908.00	6888.00	0.1130	8	0.67	0.013	4.073	2,632,246		1,316,123			70	0	19,600	4.55	89153	10,000	170,000	259,153	1,056,970	10%			72	0	20,160	4.53	91288	261,288	1,054,835	10%
S		73.12.19	73.12.18A	189	6888.00	6863.37	0.1303	8	0.67	0.013	4.374	2,826,828		1,413,414			70	0	19,600	4.55	89153	10,000	180,000	269,153	1,144,261	10%			72	0	20,160	4.53	91288	271,288	1,142,127	10%
S		73.12.18A	73.12.18	38	6860.26	6853.00	0.1911	8	0.67	0.013	5.296	3,422,746		1,711,373			70	0	19,600	4.55	89153	10,000	190,000	279,153	1,432,220	8%			72	0	20,160	4.53	91288	281,288	1,430,085	8%
S		73.12.18	73.12.17	163	6853.00	6853.00	0.2200	8	0.67	0.013	5.683	3,672,903		1,836,452			70	0	19,600	4.55	89153	10,000	200,000	289,153	1,547,299	8%			72	0	20,160	4.53	91288	291,288	1,545,164	8%
S		73.12.17	73.12.16	108	6853.00	6803.00	0.1300	8	0.67	0.013	4.369	2,823,383		1,411,692		40	110	11,200	30,800	4.23	130323	10,000	210,000	340,323	1,071,368	12%		40	112	11200	31,360	4.22	132311	342,311	1,069,381	12%
S		73.12.16	73.12.15	184	6803.00	6785.00	0.0978	8	0.67	0.013	3.790	2,449,207		1,224,603		101	211	28,168	58,968	3.81	224883	10,000	220,000	444,883	779,720	18%		101	213	28168	59,528	3.81	226676	446,676	777,927	18%
S		73.12.15	73.12.14	174	6785.00	6763.50	0.1236	8	0.67	0.013	4.259	2,752,598		1,376,299			211	0	58,968	3.81	224883	10,000	230,000	454,883	921,415	17%			213	0	59,528	3.81	226676	456,676	919,623	17%
S		73.12.14	73.12.13	157	6763.50	6743.00	0.1306	8	0.67	0.013	4.378	2,829,601		1,414,801			211	0	58,968	3.81	224883	10,000	240,000	464,883	949,917	16%			213	0	59,528	3.81	226676	466,676	948,124	16%
S		73.12.13	73.12.12	76	6743.00	6729.50	0.1776	8	0.67	0.013	5.107	3,300,336		1,650,168			211	0	58,968	3.81	224883	10,000	250,000	474,883	1,175,285	14%			213	0	59,528	3.81	226676	476,676	1,173,492	14%
S		73.12.12	73.12.11	138	6729.50	6721.50	0.0580	8	0.67	0.013	2.917	1,885,400		942,700			211	0	58,968	3.81	224883		250,000	474,883	467,817	25%			213	0	59,528	3.81	226676	476,676	466,024	25%
S		73.12.11	11	55			0.0110	12	1.00	0.013	3.747	2,421,426		1,210,713			211	0	58,968	3.81	224883		250,000	474,883	735,829	20%			213	0	59,528	3.81	226676	476,676	734,037	20%
S		11	10	202			0.0170	12	1.00	0.013	4.658	3,010,227		1,505,114			211	0	58,968	3.81	224883		250,000	474,883	1,030,230	16%			213	0	59,528	3.81	226676	476,676	1,028,438	16%
S		10	9	173			0.0100	12	1.00	0.013	3.572	2,308,739		1,154,369			211	0	58,968	3.81	224883		250,000	474,883	679,486	21%			213	0	59,528	3.81	226676	476,676	677,693	21%
S		9	8	131			0.0100	12	1.00	0.013	3.572	2,308,739		1,154,369			211	0	58,968	3.81	224883		250,000	474,883	679,486	21%			213	0	59,528	3.81	226676	476,676	677,693	21%
S		8	7	208			0.0090	12	1.00	0.013	3.389	2,190,262		1,095,131			211	0	58,968	3.81	224883		250,000	474,883	620,247	22%			213	0	59,528	3.81	226676	476,676	618,455	22%
S		7	5	85			0.0100	12	1.00	0.013	3.572	2,308,739		1,154,369			211	0	58,968	3.81	224883		250,000	474,883	679,486	21%			213	0	59,528	3.81	226676	476,676	677,693	21%
S		5	4	128			0.0260	15	1.25	0.013	10.444	6,749,758		4,724,830			211	0	58,968	3.81	224883		250,000	474,883	4,249,947	7%			213	0	59,528	3.81	226676	476,676	4,248,154	7%
S		4	3	361			0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			211	0	58,968	3.81	224883		250,000	474,883	1,597,092	16%			213	0	59,528	3.81	226676	476,676	1,595,299	16%
S		3	2	125			0.0170	15	1.25	0.013	8.445	5,457,905		3,820,534			211	0	58,968	3.81	224883		250,000	474,883	3,345,650	9%			213	0	59,528	3.81	226676	476,676	3,343,857	9%
S		2	1	41			0.0260	15	1.25	0.013	10.444	6,749,758		4,724,830			211	0	58,968	3.81	224883		250,000	474,883	4,249,947	7%			213	0	59,528	3.81	226676	476,676	4,248,154	7%
R BASIN TRUNK																																				
R	R	87.4	87.3	315			0.0030	8	0.67	0.013	0.664	428,903		214,451		17	17	4,732	4,732	5.71	27020		0	27,020	187,432		3	20	20	5572	5,572	5.56	30995	30,995	183,457	7%
R		87.3	87.2	352			0.0030	8	0.67	0.013	0.664	428,903		214,451		17	34	4,760	9,492	5.11	48486		0	48,486	165,965			17	37	4760	10,332	5.04	52066	52,066	162,385	12%
R		87.2	87.1	440			0.0030	8	0.67	0.013	0.664	428,903		214,451		17	51	4,760	14,252	4.79	68217		0	68,217	146,234			17	54	4760	15,092	4.74	71579	71,579	142,872	17%
R		87.1	87	187			0.0030	8	0.67	0.013	0.664	428,903		214,451		16	67	4,480	18,732	4.58	85824		0	85,824	128,627			16	70	4480	19,572	4.55	89046	89,046	125,406	21%
Q-1 BASIN TRUNK																																				
Q	Q-1	73.53.4	73.53.3	258	7178.35	7153.43	0.0966	8	0.67	0.013	3.766	2,433,673		1,216,837		701	701	196,252	196,252	3.15	617453		0	617,453	599,384	25%		701	701	196252	196,252	3.15	617453	617,453	599,384	25%
Q		73.53.3	73.53.2	256	7153.18	7142.26	0.0427	8	0.67	0.013	2.503	1,617,296		808,648			701	0	196,252	3.15	617453		0	617,453	191,195	38%			701	0	196,252	3.15	617453	617,453	191,195	38%
Q		73.53.2	73.53.1	18	7142.01	7139.69	0.1289	8	0.67	0.013	4.350	2,811,291		1,405,646			701	0	196,252	3.15	617453		0	617,453	788,193	22%			701	0	196,252	3.15	617453	617,453	788,193	22%
Q		73.53.1	73.53	150	7139.44	7133.26	0.0412	8	0.67	0.013	2.459	1,589,449		794,725			701	0	196,252	3.15	617453		0	617,453	177,272	39%			701	0	196,252	3.15	617453	617,453	177,272	39%
Q		73.53	73.52	111	7133.40	7129.00	0.0396	8	0.67	0.013	2.412	1,559,060		779,530			701	0	196,252	3.15	617453		0	617,453	162,078	40%			701	0	196,252	3.15	617453	617,453	162,078	40%
Q		73.52	73.51	174	7129.00	7121.00	0.0460	8	0.67	0.013	2.598	1,679,069		839,534			701	0	196,252	3.15	617453		0	617,453	222,082	37%			701	0	196,252	3.15	617453	617,453	222,082	37%
Q		73.51	73.50.A	70	7121.00		0.0703	8	0.67	0.013	3.213	2,076,416		1,038,208			701	0	196,252	3.15	617453		0	617,453	420,755	30%			701	0	196,252	3.15	617453	617,453	420,755	30%
Q		73.50.A	73.50	186		7103.00	0.0703	8	0.67	0.013	3.213	2,076,232		1,038,116			701	0	196,252	3.15	617453		0	617,453	420,663	30%			701	0	196,252	3.15	617453	617,453	420,663	30%
Q		73.50	73.49	351	7103.00	7079.75	0.0662	8	0.67	0.013	3.118	2,015,376		1,007,688			701	0	196,252	3.15	617453		0	617,453	390,235	31%			701	0	196,252	3.15	617453	617,453	390,235	31%
Q		73.49	73.48	131	7079.75	7074.50	0.0401	8	0.67	0.013	2.426	1,567,625		783,812			701	0	196,252	3.15	617453		0	617,453	166,360	39%			701	0	196,252	3.15	617453	617,453	166,360	39%
Q		73.48	73.47	112	7074.50		0.0760	8	0.67	0.013	3.340	2,158,763		1,079,381			701	0	196,252	3.15	617453		0	617,453	461,929	29%			701	0	196,252	3.15	617453	617,453	461,929	29%
Q		73.47	73.46	265		7045.50	0.0760	8	0.67	0.013	3.340	2,158,763		1,079,381			701	0	196,252	3.15	617453		0	617,453	461,929	29%			701	0	196,252	3.15	617453	617,453	461,929	29%
Q		73.46	73.45	190	7045.50		0.0826	8	0.67	0.013	3.482	2,250,310		1,125,155			701	0	196,252	3.15	617453		0	617,453	507,702	27%			701	0	196,252	3.15	617453	617,453	507,702	27%
Q		73.45	73.44	70			0.0826	8	0.67	0.013	3.482	2,250,547		1,125,274			701	0	196,252	3.15	617453		0	617,453	507,821	27%			701	0	196,252	3.15	617453	617,453	507,821	27%
Q		73.44	73.43	73		7018.00	0.0826	8	0.67	0.013	3.482	2,250,547		1,125,274			701	0	196,252	3.15	617453		0	617,453	507,821	27%			701	0	196,252	3.15	617453	617,453	507,821	27%
Q		73.43	73.42	173	7018.00	7010.00	0.0462	8	0.67	0.013	2.606	1,683,915		841,957			701	0	196,252	3.15	617453		0	617,453	224,505	37%			701	0	196,252	3.15	617453	617,453	224,505	37%
Q		73.42	73.41	306	7004.75	6965.50	0.1283	8	0.67	0.013	4.340	2,804,512		1,402,256			701	0	196,252	3.15	617453		0	617,453	784,803	22%			701	0	196,252	3.15	617453	617,453	784,803	22%
Q		73.41	73.40	79	6961.50	6948.00	0.1709	8	0.67	0.013	5.009	3,237,065		1,618,533			701	0	196,252	3.15	617453		0	617,453	1,001,080	19%			701	0	196,252	3.15	617453	617,453	1,001,080	19%
Q		73.40	73.39	146	6948.00	6931.00	0.1164	8	0.67	0.013	4.135	2,672,060		1,336,030			701	0	196,252	3.15	617453		0	617,453	718,577	23%			701	0	196,252	3.15	617453	617,453	718,577	23%
Q		73.39	73.38A	135	6931.00		0.0930	8	0.67	0.013	3.695	2,388,029		1,194,014			701	0	196,252	3.15	617453		0	617,453	576,562	26%			701	0	196,252	3.15	617453	617,453	576,562	26%
Q		73.38A	73.38	152		6904.00	0.0930	8	0.67	0.013	3.695	2,388,029		1,194,014			701	0	196,252	3.15	617453		0	617,453	576,562	26%			701	0	196,252	3.15	617453	617,453	576,562	26%
Q		73.38	73.37	114	6904.00	6895.75	0.0724	8	0.67	0.013	3.260	2,106,554		1,053,277			701	0	196,252	3.15	617453	15,000	15,000	632,453	420,825	30%			701	0	196,252	3.15	617453	632,453	420,825	30%
Q		73.37	73.36	199	6895.75	6873.75	0.1106	8	0.67	0.013	4.029	2,603,652		1,301,826			701	0	196,252	3.15	617453	15,000	30,000	647,453	654,373	25%			701	0	196,252	3.15	617453	647,453	654,373	25%
Q		73.36	73.35	200	6873.75	6872.75	0.0050	8	0.67	0.013	0.857	553,711		276,855			701	0	196,252	3.15	617453	15,000	45,000	662,453	-385,597	120%			701	0	196,252	3.15	617453	662,453	-385,597	120%
Q		73.35	73.34	200	6872.75	6871.50	0.0063	8	0.67	0.013	0.958	619,068		309,534			701	0	196,252	3.15	617453	15,000	60,000	677,453	-367,919	109%			701	0	196,252	3.15	617453	677,453	-367,919	109%
Q		73.34	73.33	208	6871.50	6840.00	0.1514	8	0.67	0.013	4.715	3,047,346		1,523,673			701	0	196,252	3.15	617453	15,000	75,000	692,453	831,220	23%			701	0	196,252	3.15	617453	692,453	831,220	23%

REACH	SUB REACH	Manhole U/S	Manhole D/S	Length (ft.)	Invert Elevations OUT	Invert Elevations IN	Pipe Slope	Pipe Diam. (in.)	Pipe Diam (ft.)	Mannings n	Q(full) (cfs)	Q(full) (gpd)	*Q(Allow) (cfs)	*Q(Allowable) (gpd)	Area (acres)	Existing (EQR)	Existing (Cum. EQR)	Existing Q-Ave (gpd)	Existing Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	I & I (gpd)	I & I Cumm.	Existing **IPF (gpd)	Existing Excess Capacity	Percent Capacity	Proposed (EQR)	Ultimate (EQR)	Ultimate (Cum. EQR)	Ultimate Q-Ave (gpd)	Ultimate Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	Ultimate IPF (gpd)	Ultimate Excess Capacity	Percent Capacity
Q		73.33	73.32	179	6840.00	6825.50	0.0810	8	0.67	0.013	3.449	2,228,720		1,114,360			701	0	196,252	3.15	617453	15,000	90,000	707,453	406,908	32%			701	0	196,252	3.15	617453	707,453	406,908	32%
Q		73.32	73.31	173	6824.50	6811.50	0.0751	8	0.67	0.013	3.321	2,146,578		1,073,289			701	0	196,252	3.15	617453	15,000	105,000	722,453	350,837	34%			701	0	196,252	3.15	617453	722,453	350,837	34%
Q		73.31	73.30	420	6811.50	6808.25	0.0077	8	0.67	0.013	1.066	688,835		344,417			701	0	196,252	3.15	617453	15,000	120,000	737,453	-393,035	107%			701	0	196,252	3.15	617453	737,453	-393,035	107%
Q		73.30	73.29	97	6808.25	6807.50	0.0077	8	0.67	0.013	1.065	688,562		344,281			701	0	196,252	3.15	617453	15,000	135,000	752,453	-408,172	109%			701	0	196,252	3.15	617453	752,453	-408,172	109%
Q		73.29	73.28	151	6807.50	6800.25	0.0480	8	0.67	0.013	2.655	1,715,847		857,924			701	0	196,252	3.15	617453	15,000	150,000	767,453	90,471	45%			701	0	196,252	3.15	617453	767,453	90,471	45%
Q		73.28	73.27	108	6800.25	6789.00	0.1042	8	0.67	0.013	3.911	2,527,333		1,263,667			701	0	196,252	3.15	617453		150,000	767,453	496,214	30%			701	0	196,252	3.15	617453	767,453	496,214	30%
Q		73.27	73.26	136	6789.00	6782.00	0.0515	8	0.67	0.013	2.749	1,776,551		888,276			701	0	196,252	3.15	617453		150,000	767,453	120,823	43%			701	0	196,252	3.15	617453	767,453	120,823	43%
Q		73.26	73.25	298	6782.00	6775.50	0.0218	8	0.67	0.013	1.789	1,156,503		578,251			701	0	196,252	3.15	617453		150,000	767,453	-189,201	66%			701	0	196,252	3.15	617453	767,453	-189,201	66%
Q		73.25	73.24	300	6775.50	6761.50	0.0467	8	0.67	0.013	2.617	1,691,615		845,807			701	0	196,252	3.15	617453		150,000	767,453	78,355	45%			701	0	196,252	3.15	617453	767,453	78,355	45%
Q		73.24	73.23	358	6761.50	6761.50	0.0230	8	0.67	0.013	1.838	1,187,578		593,789			701	0	196,252	3.15	617453		150,000	767,453	-173,664	65%			701	0	196,252	3.15	617453	767,453	-173,664	65%
Q		73.23	73.22	300	6761.50	6747.50	0.0467	8	0.67	0.013	2.617	1,691,615		845,807			701	0	196,252	3.15	617453		150,000	767,453	78,355	45%			701	0	196,252	3.15	617453	767,453	78,355	45%
Q		73.22	73.21	380	6747.50		0.0269	8	0.67	0.013	1.987	1,283,971		641,985			701	0	196,252	3.15	617453		150,000	767,453	-125,467	60%			701	0	196,252	3.15	617453	767,453	-125,467	60%
Q		73.21	73.20	94			0.0269	8	0.67	0.013	1.987	1,284,323		642,161			701	0	196,252	3.15	617453		150,000	767,453	-125,291	60%			701	0	196,252	3.15	617453	767,453	-125,291	60%
Q		73.20	73.19	69			0.0269	8	0.67	0.013	1.987	1,284,323		642,161			701	0	196,252	3.15	617453		150,000	767,453	-125,291	60%			701	0	196,252	3.15	617453	767,453	-125,291	60%
Q		73.19	73.18	189		6727.82	0.0269	8	0.67	0.013	1.987	1,284,323		642,161			701	0	196,252	3.15	617453		150,000	767,453	-125,291	60%			701	0	196,252	3.15	617453	767,453	-125,291	60%
Q		73.18	73.17	188	6727.71	6727.00	0.0038	8	0.67	0.013	0.745	481,225		240,613			701	0	196,252	3.15	617453		150,000	767,453	-526,840	159%			701	0	196,252	3.15	617453	767,453	-526,840	159%
Q	Q-2	73.17	73.16	12	6726.50	6722.25	0.3542	8	0.67	0.013	7.211	4,660,172		2,330,086		155	856	43,484	239,736	3.05	730492		150,000	880,492	1,449,594	19%		155	856	43484	239,736	3.05	730492	880,492	1,449,594	19%
Q		73.16	73.15	405	6722.25	6710.25	0.0296	10	0.83	0.013	3.782	2,443,925		1,221,963			856	0	239,736	3.05	730492		150,000	880,492	341,470	36%			856	0	239,736	3.05	730492	880,492	341,470	36%
Q		73.15	73.14	40	6710.25	6708.50	0.0438	10	0.83	0.013	4.595	2,969,709		1,484,854			856	0	239,736	3.05	730492		150,000	880,492	604,362	30%			856	0	239,736	3.05	730492	880,492	604,362	30%
Q		73.14	73.13	129	6708.50		0.0050	10	0.83	0.013	1.553	1,003,945		501,972			856	0	239,736	3.05	730492		150,000	880,492	-378,520				856	0	239,736	3.05	730492	880,492	-378,520	
Q		73.13	73.12	23			0.0050	10	0.83	0.013	1.553	1,003,945		501,972			856	0	239,736	3.05	730492		150,000	880,492	-378,520				856	0	239,736	3.05	730492	880,492	-378,520	
Q-2 BASIN TRUNK																																				
Q	Q-2	73.17.16	73.17.15	215	6860.50	6851.00	0.0442	8	0.67	0.013	2.547	1,646,041		823,021		155	155	43,484	43,484	4.00	174115	5,000	5,000	179,115	643,905	11%		155	155	43484	43,484	4.00	174115	179,115	643,905	11%
Q		73.17.15	73.17.14	163	6850.50	6845.20	0.0325	8	0.67	0.013	2.185	1,412,025		706,012			155	0	43,484	4.00	174115	5,000	10,000	184,115	521,897	13%			155	0	43,484	4.00	174115	184,115	521,897	13%
Q		73.17.14	73.17.13	152	6844.70	6836.00	0.0572	8	0.67	0.013	2.899	1,873,423		936,712			155	0	43,484	4.00	174115	5,000	15,000	189,115	747,597	10%			155	0	43,484	4.00	174115	189,115	747,597	10%
Q		73.17.13	73.17.12	158	6835.50	6830.00	0.0348	8	0.67	0.013	2.261	1,461,002		730,501			155	0	43,484	4.00	174115	5,000	20,000	194,115	536,386	13%			155	0	43,484	4.00	174115	194,115	536,386	13%
Q		73.17.12	73.17.11	78	6829.70	6826.25	0.0442	8	0.67	0.013	2.548	1,646,874		823,437			155	0	43,484	4.00	174115	5,000	25,000	199,115	624,322	12%			155	0	43,484	4.00	174115	199,115	624,322	12%
Q		73.17.11	73.17.10	346	6826.00	6822.80	0.0092	8	0.67	0.013	1.165	753,070		376,535			155	0	43,484	4.00	174115	5,000	30,000	204,115	172,420	27%			155	0	43,484	4.00	174115	204,115	172,420	27%
Q		73.17.10	73.17.9	314	6822.40	6819.60	0.0089	8	0.67	0.013	1.144	739,456		369,728			155	0	43,484	4.00	174115	5,000	35,000	209,115	160,613	28%			155	0	43,484	4.00	174115	209,115	160,613	28%
Q		73.17.9	73.17.8	399	6819.40	6811.00	0.0211	8	0.67	0.013	1.758	1,136,191		568,095			155	0	43,484	4.00	174115	5,000	40,000	214,115	353,980	19%			155	0	43,484	4.00	174115	214,115	353,980	19%
Q		73.17.8	73.17.7	403	6811.00		0.0220	8	0.67	0.013	1.797	1,161,474		580,737			155	0	43,484	4.00	174115		40,000	214,115	366,622	18%			155	0	43,484	4.00	174115	214,115	366,622	18%
Q		73.17.7	73.17.6	61			0.0220	8	0.67	0.013	1.797	1,161,474		580,737			155	0	43,484	4.00	174115		40,000	214,115	366,622	18%			155	0	43,484	4.00	174115	214,115	366,622	
Q		73.17.6	73.17.5	474		6790.20	0.0220	8	0.67	0.013	1.797	1,161,474		580,737			155	0	43,484	4.00	174115		40,000	214,115	366,622	18%			155	0	43,484	4.00	174115	214,115		
Q		73.17.5	73.17.4A	523	6790.20	6774.00	0.0310	7.125	0.59	0.013	1.566	1,011,947		505,974			155	0	43,484	4.00	174115		40,000	214,115	291,858	21%			155	0	43,484	4.00	174115	214,115	291,858	21%
Q		73.17.4A	73.17.4	100	6767.50	6765.09	0.0241	7.125	0.59	0.013	1.381	892,606		446,303			155	0	43,484	4.00	174115		40,000	214,115	232,188	24%			155	0	43,484	4.00	174115	214,115	232,188	24%
Q		73.17.4	73.17.3	94	6759.00	6755.82	0.0338	8	0.67	0.013	2.229	1,440,283		720,141			155	0	43,484	4.00	174115		40,000	214,115	506,026	15%			155	0	43,484	4.00	174115	214,115	506,026	15%
Q		73.17.3	73.17.2	416	6750.00	6738.17	0.0284	8	0.67	0.013	2.043	1,320,516		660,258			155	0	43,484	4.00	174115		40,000	214,115	446,143	16%			155	0	43,484	4.00	174115	214,115	446,143	16%
Q		73.17.2	73.17.1	136	6735.65	6734.70	0.0070	8	0.67	0.013	1.013	654,471		327,236			155	0	43,484	4.00	174115		40,000	214,115	113,120	33%			155	0	43,484	4.00	174115	214,115	113,120	33%
Q		73.17.1	73.17	372	6734.64	6727.00	0.0205	8	0.67	0.013	1.736	1,122,208		561,104			155	0	43,484	4.00	174115		40,000	214,115	346,989	19%			155	0	43,484	4.00	174115	214,115	346,989	19%
O-4A BASIN TRUNK																																				
O	O-4A	76.13.8.3	76.13.8.2	128			0.0050	8	0.67	0.013	0.857	553,711		276,855		5	5	1,372	1,372	6.96	9550		0	9,550	267,305	2%	3	8	8	2212	2,212	6.45	14265	14,265	262,591	
O		76.13.8.2	76.13.8.1	386			0.0050	8	0.67	0.013	0.857	553,711		276,855		4	9	1,120	2,492	6.33	15767		0	15,767	261,089	3%	3	7	15	1960	4,172	5.83	24307	24,307	252,549	
O		76.13.8.1	76.13.8	101		6792.00	0.0050	8	0.67	0.013	0.857	553,711		276,855		4	13	1,120	3,612	5.96	21535		0	21,535	255,320	4%	3	7	22	1960	6,132	5.48	33591	33,591		
O		76.13.8	76.13.7	170	6791.00	6782.00	0.0529	8	0.67	0.013	2.788	1,801,752		900,876		4	17	1,120	4,732	5.71	27020		0	27,020	873,856	1%	3	7	29	1960	8,092	5.24	42404	42,404	858,472	2%
O		76.13.7	76.13.6	121	6781.00	6778.00	0.0248	8	0.67	0.013	1.908	1,233,008		616,504		4	21	1,120	5,852	5.52	32298		0	32,298	584,206	3%	3	7	36	1960	10,052	5.06	50878	50,878	565,626	4%
O		76.13.6	76.13.5	144	6777.25	6760.30	0.1177	8	0.67	0.013	4.157	2,686,592		1,343,296		4	25	1,120	6,972	5.37	37416		0	37,416	1,305,880	1%	3	7	43	1960	12,012	4.92	59090	59,090	1,284,206	2%
O		76.13.5	76.13.4	298.5	6760.13	6760.22	0.0010	8	0.67	0.013	0.383	247,627		123,814		4	29	1,120	8,092	5.24	42404		0	42,404	81,410	17%	3	7	50	1960	13,972	4.80	67090	67,090		
O		76.13.4	76.13.3.1	211.5	6760.12	6759.64	0.0023	8	0.67	0.013	0.577	373,047		186,524		4	33	1,120	9,212	5.13	47282		0	47,282	139,241	13%	3	7	57	1960	15,932	4.70	74911	74,911	111,612	20%
O		76.13.3.1	76.13.3	108	6759.43	6759.29	0.0013	8	0.67	0.013	0.436	281,936		140,968		4	37	1,120	10,332	5.04	52066		0	52,066	88,902	18%	1	5	62	1400	17,332	4.64	80403	80,403	60,565	29%
O		76.13.3	76.13.2	260	6759.12	6744.99	0.0543	8	0.67	0.013	2.825	1,825,503		912,751		4	41	1,120	11,452	4.96	56768		0	56,768	855,984	3%		4	66	1120	18,452	4.59	84745	84,745	828,006	5%
O		76.13.2	76.13.1	226	6744.79	6741.25	0.0157	8	0.67	0.013	1.516	980,044		490,022		4	45	1,120	12,572	4.88	61396		0	61,396	428,626	6%		4	70	1120	19,572	4.55	89046	89,046	400,976	9%
O		76.13.1	76.13C	31	6741.25	6740.30	0.0306	8	0.67	0.013	2.121	1,370,816		685,408		4	49	1,120	13,692	4.82	65959		0	65,959	619,449	5%		4	74	1120	20,692	4.51	93307	93,307	592,101	7%
O		76.13C	76.13B	84	6740.30	6738.45	0.0220	8	0.67	0.013	1.798	1,162,102		581,051		4	53	1,120	14,812	4.76	70462		0	70,462	510,589	6%		4	78	1120	21,812	4.47	97531	97,531	483,520	8%
O	O-4B	7613B	76.13A	91	6738.45	6738.10	0.0038	8	0.67	0.013	0.751	485,637		242,818		66	119	18,480	33,292	4.18	139125		0	139,125	103,693	29%	25	91	169	25480	47,292	3.95	186836	186,836	55,982	38%
O		76.13A	76.13	94	6738.10	6737.77	0.0035	8	0.67	0.013	0.718	463,971		231,986			119	0	33,292	4.18	139125		0	139,125	92,861	30%			169	0	47,292	3.95	186836	186,836	45,149	40%
O		76.13	76.12	397	6737.60	6731.50	0.0154	10	0.83	0.013	2.723	1,759,926		879,963			119	0	33,292	4.18	139125		0	139,125	740,838	8%			169	0	47,292	3.95	186836	186,836	693,127	11%
O		76.12	76.11	396	6731.50	6724.25	0.0183	10	0.83	0.013	2.973	1,921,083		960,542			119	0	33,292	4.18	139125		0	139,125	821,417	7%			169	0	47,292	3.95	186836	186,836	773,705	10%
O		76.11	76.10	142	6724.25	6722.50	0.0123	10	0.83	0.013	2.439	1,576,158		788,079			119	0	33,292	4.18	139125		0	139,125	648,954	9%			169	0	47,292	3.95	186836	186,836	601,242	12%
O		76.10	76.9	48	6722.50	6722.00	0.0104	10	0.83	0.013	2.242	1,449,069		724,535			119	0	33,292	4.18	139125		0	139,125	585,410	10%			169	0	47,292	3.95	186836	186,836	537,698	13%
O		76.9	76.8	194	6722.00	6719.00	0.0155	10	0.83	0.013	2.732	1,765,569		882,784			119	0	33,292	4.18	139125		0	139,125	743,659	8%			169	0	47,292	3.95	186836	186,836	695,948	11%
O		76.8	76.7	374	6719.00	6710.50	0.0227	12	1.00	0.013	5.386	3,480,555		1,740,277			119	0	33,292	4.18	139125		0	139,125	1,601,152	4%			169	0	47,292	3.95	186836	186,836	1,553,441	5%
O	O-5	76.7	76.6	369	6710.50	6708.50	0.0054	15	1.25	0.013	4.769	3,081,792		2,157,254		199	318	55,636	88,928	3.57	317565		0	317,565	1,839,690	10%		199	368	55636	102,928	3.49	359061	359,061	1,798,194	12%
O		76.6	76.5	26	6708.50	6708.25	0.0096	15	1.25	0.013	6.351	4,104,732		2,873,313			318	0	88,928	3.57	317565		0	317,565	2,555,748	8%			368	0	102,928	3.49	359061	359,061	2,514,252	9%
O	O-2 + O-3	76.5	76.4	386	6708.25	6700.75	0.0194	12	1.00	0.013	4.980	3,218,191		1,609,095		263	581	73,668	162,596	3.24	527196	578,000	578,000	1,105,196	503,899	34%	4	267	635	74788	177,716	3.20	568081	1,146,081	463,015	36%
O		76.4	76.3	386	6700.75	6698.00	0.0071	15	1.25	0.013	5.467	3,533,249		2,473,274			581	0	162,596	3.24	527196		578,000	1,105,196	1,368,078	31%			635	0	177,716	3.20	568081	1,146,081	1,327,193	32%
O	O-1	76.3	76.2	340	6698.00	6693.75	0.0125	15	1.25	0.013	7.242	4,680,115		3,276,080		393	973	109,900	272,496	2.99	813471		578,000	1,391,471	1,884,609	30%	2	395	1029	110488	288,204	2.96	852683	1,430,683	1,845,397	31%
O		76.2	76.1	401	6693.75	6690.00	0.0094	15	1.25	0.013	6.264	4,048,042		2,833,629			973	0	272,496	2.99	813471		578,000	1,391,471	1,442,158	34%			1029	0	288,204	2.96	852683	1,430,683	1,402,946	35%
O		76.1	76	205	6689.00		0.0090	15	1.25	0.013	6.145	3,971,209		2,779,846			973	0	272,496	2.99	813471	51,000	629,000	1,442,471	1,337,375	36%			1029	0	288,204	2.96	852683	1,481,683	1,298,163	37%
O-4B BASIN TRUNK																																				
O	O-4B	76.41	76.40	130	6840.40	6839.20	0.0092	8	0.67	0.013	1.164	752,345		376,173		25	25	7,000	7,000	5.36	37542		0	37,542	338,630	5%	13	38	38	10640	10,640	5.02	53367	53,367	322,806	7%
O		76.40	76.39	155	6838.90	6837.40	0.0097	8	0.67	0.013	1.192	770,332		385,166			25	0	7,000	5.36	37542		0	37,542	347,624	5%			38	0	10,640	5.02	53367	53,367	331,799	7%
O		76.39	76.38	300	6837.10	6833.70	0.0113	8	0.67	0.013	1.290	833,637		416,818			25	0	7,000	5.36	37542		0	37,542	379,276	5%			38	0	10,640	5.02	53367	53,367	363,452	6%
O		76.38	76.37	94	6833.40	6832.30	0.0117	8	0.67	0.013	1.311	847,092		423,546			25	0	7,000	5.36	37542		0	37,542	386,004	4%			38	0	10,640	5.02	53367	53,367	370,179	6%
O		76.37	76.36	280	6832.00	6829.50	0.0089	8	0.67	0.013	1.145	739,927		369,964			25	0	7,000	5.36	37542		0	37,542	332,421	5%			38	0	10,640	5.02	53367	53,367	316,597	7%
O		76.36	76.35	239	6829.40	6826.80	0.0109	8	0.67	0.013	1.264	816,744		408,372			25	0	7,000	5.36	37542		0	37,542	370,829	5%			38	0	10,640	5.02	53367	53,367	355,005	7%
O		76.35	76.34	228	6826.60	6824.20	0.0105	8	0.67	0.013	1.243	803,408		401,704			25	0	7,000	5.36	37542		0	37,542	364,162	5%			38	0	10,640	5.02	53367	53,367	348,337	7%
O		76.34	76.33	232	6824.00	6814.50	0.0409	8	0.67	0.013	2.452	1,584,586		792,293			25	0	7,000	5.36	37542		0	37,542	754,751	2%			38	0	10,640	5.02	53367	53,367	738,926	3%
O		76.33	76.32	354	6814.00	6804.75	0.0261	8	0.67	0.013	1.959	1,265,807		632,903			25	0	7,000	5.36	37542		0	37,542	595,361	3%			38	0	10,640	5.02	53367	53,367	579,537	4%
O		76.32	76.31	308	6804.40	6800.00	0.0143	8	0.67	0.013	1.448	935,942		467,971			25	0	7,000	5.36	37542		0	37,542	430,429	4%			38	0	10,640	5.02	53367	53,367	414,604	6%
O		76.31	76.30	258	6799.30	6796.60	0.0105	8	0.67	0.013	1.240	801,069		400,535			25	0	7,000	5.36	37542		0	37,542	362,992	5%			38	0	10,640	5.02	53367	53,367	347,168	7%
O		76.30	76.29	209	6795.80	6793.75	0.0098	8	0.67	0.013	1.200	775,536		387,768			25	0	7,000	5.36	37542		0	37,542	350,226	5%			38	0	10,640	5.02	53367	53,367	334,401	7%
O		76.29	76.28	206	6793.40	6791.50	0.0092	8	0.67	0.013	1.164	752,041		376,020			25	0	7,000	5.36	37542		0	37,542	338,478	5%			38	0	10,640	5.02	53367	53,367	322,654	7%
O		76.28	76.27	127	6791.30	6790.00	0.0102	8	0.67	0.013	1.226	792,260		396,130			25	0	7,000	5.36	37542		0	37,542	358,588	5%			38	0	10,640	5.02	53367	53,367	342,763	7%
O		76.27	76.26	209	6789.60	6783.50	0.0292	8	0.67	0.013	2.070	1,337,796		668,898		10	35	2,800	9,800	5.08	49805		0	49,805	619,093	4%	12	22	60	6160	16,800	4.66	78325	78,325	590,573	6%
O		76.26	76.25	126	6783.10	6781.70	0.0111	8	0.67	0.013	1.277	825,424		412,712		2	37	560	10,360	5.04	52185		0	52,185	360,527	6%		2	62	560	17,360	4.64	80512	80,512	332,200	10%
O		76.25	76.24	36	6781.60	6781.00	0.0167	8	0.67	0.013	1.564	1,010,933		505,467		2	39	560	10,920	4.99	54544		0	54,544	450,923	5%		2	64	560	17,920	4.61	82688	82,688	422,778	8%
O		76.24	76.23	89	6781.00	6780.00	0.0112	8	0.67	0.013	1.284	830,048		415,024		2	41	560	11,480	4.96	56884		0	56,884	358,140	7%		2	66	560	18,480	4.59	84853	84,853	330,170	10%
O		76.23	76.22	229	6780.00	6774.80	0.0227	8	0.67	0.013	1.826	1,180,000		590,000		2	43	560	12,040	4.92	59206		0	59,206	530,794	5%		2	68	560	19,040	4.57	87008	87,008	502,992	7%
O		76.22	76.21	176	6773.50	6771.00	0.0142	8	0.67	0.013	1.444	933,280		466,640		2	45	560	12,600	4.88	61511		0	61,511	405,129	7%		2	70	560	19,600	4.55	89153	89,153	377,487	10%
O		76.21	76.20	269	6770.84	6767.12	0.0138	8	0.67	0.013	1.425	920,860		460,430		2	47	560	13,160	4.85	63799		0	63,799	396,631	7%		2	72	560	20,160	4.53	91288	91,288	369,142	10%
O		76.20	76.19	112	6766.68	6766.50	0.0016	12	1.00	0.013	1.432	925,555		462,777		2	49	560	13,720	4.82	66072		0	66,072	396,705	7%		2	74	560	20,720	4.51	93413	93,413	369,364	10%
O		76.19	76.18	200	6764.00		0.0190	8	0.67	0.013	1.670	1,079,381		539,691		2	51	560	14,280	4.79	68330		0	68,330	471,361	6%		2	76	560	21,280	4.49	95529	95,529	444,162	9%
O		76.18	76.17	220		6756.00	0.0190	8	0.67	0.013	1.670	1,079,381		539,691		2	53	560	14,840	4.76	70574		0	70,574	469,117	7%		2	78	560	21,840	4.47	97636	97,636	442,054	9%
O		76.17	76.16	270	6756.00		0.0179	8	0.67	0.013	1.621	1,047,670		523,835		2	55	560	15,400	4.73	72804		0	72,804	451,031	7%		2	80	560	22,400	4.45	99735	99,735	424,100	10%
O		76.16	76.15	260		6746.50	0.0179	8	0.67	0.013	1.621	1,047,670		523,835		2	57	560	15,960	4.70	75022		0	75,022	448,813	7%		2	82	560	22,960	4.43	101825	101,825	422,010	10%
O		76.15	76.14	280	6746.50	6742.00	0.0161	8	0.67	0.013	1.536	992,717		496,358		3	60	840	16,800	4.66	78325		0	78,325	418,034	8%		3	85	840	23,800	4.41	104946	104,946	391,413	11%
O		76.14	76.13B.1	103	6742.00	6740.76	0.0120	8	0.67	0.013	1.329	859,192		429,596		3	63	840	17,640	4.63	81602		0	81,602	347,995	9%		3	88	840	24,640	4.39	108048	108,048	321,548	13%
O		76.13B.1	76.13B	76	6740.46	6738.45	0.0264	8	0.67	0.013	1.970	1,273,472		636,736		3	66	840	18,480	4.59	84853		0	84,853	551,882	7%		3	91	840	25,480	4.36	111134	111,134	525,602	9%
O-6 BASIN TRUNK																																				
O	O-6	73.8.5	73.8.4	117	6716.25	6715.75	0.0043	8	0.67	0.013	0.792	511,906		255,953		33	33	9,324	9,324	5.12	47765		0	47,765	208,188	9%	6	40	40	11060	11,060	4.98	55131	55,131	200,822	11%
O		73.8.4	73.8.3	370	6715.75	6714.00	0.0047	8	0.67	0.013	0.833	538,538		269,269		30	63	8,400	17,724	4.62	81928		0	81,928	187,341	15%		30	70	8400	19,460	4.55	88618	88,618	180,651	16%
O		73.8.3	73.8.2	226	6714.00	6712.25	0.0077	8	0.67	0.013	1.066	689,069		344,535		30	93	8,400	26,124	4.34	113489		0	113,489	231,046	16%		30	100	8400	27,860	4.30	119791	119,791	224,744	17%
O		73.8.2	73.8.1	351	6712.25	6699.00	0.0377	8	0.67	0.013	2.354	1,521,432		760,716		30	123	8,400	34,524	4.15	143437		0	143,437	617,279	9%		30	130	8400	36,260	4.12	149472	149,472	611,244	10%
O		73.8.1	73.8.A	45	6698.50	6693.50	0.1111	8	0.67	0.013	4.039	2,610,219		1,305,109		30	153	8,400	42,924	4.01	172230		0	172,230	1,132,880	7%		30	160	8400	44,660	3.99	178062	178,062	1,127,047	7%
O-5 BASIN TRUNK																																				
O	O-5	76.7.3.2.8	76.7.3.2.7	58	6765.58	6764.91	0.0116	8	0.67	0.013	1.302	841,631		420,815		19	19	5,236	5,236	5.62	29417		0	29,417	391,398	3%		19	19	5236	5,236	5.62	29417	29,417	391,398	3%
O		76.7.3.2.7	76.7.3.2.6	414	6764.71	6757.00	0.0186	8	0.67	0.013	1.654	1,068,625		534,312		15	34	4,200	9,436	5.11	48246		0	48,246	486,066	5%		15	34	4200	9,436	5.11	48246	48,246	486,066	5%
O		76.7.3.2.6	76.7.3.2.5	299	6757.00	6751.00	0.0201	8	0.67	0.013	1.716	1,109,272		554,636		15	49	4,200	13,636	4.82	65732		0	65,732	488,904	6%		15	49	4200	13,636	4.82	65732	65,732	488,904	6%
O		76.7.3.2.5	76.7.3.2.4	286	6751.00	6745.00	0.0210	8	0.67	0.013	1.755	1,134,203		567,101		15	64	4,200	17,836	4.62	82363		0	82,363	484,739	7%		15	64	4200	17,836	4.62	82363	82,363	484,739	7%
O		76.7.3.2.4	76.7.3.2.3	26	6745.00	6744.50	0.0192	8	0.67	0.013	1.680	1,085,917		542,958		15	79	4,200	22,036	4.46	98372		0	98,372	444,586	9%		15	79	4200	22,036	4.46	98372	98,372	444,586	9%
O		76.7.3.2.3	76.7.3.2.2	314	6744.50	6738.50	0.0191	8	0.67	0.013	1.675	1,082,453		541,226		15	94	4,200	26,236	4.34	113897		0	113,897	427,329	11%		15	94	4200	26,236	4.34	113897	113,897	427,329	11%
O		76.7.3.2.2	76.7.3.2.1	167	6738.50	6737.00	0.0090	8	0.67	0.013	1.148	742,139		371,070		15	109	4,200	30,436	4.24	129028		0	129,028	242,041	17%		15	109	4200	30,436	4.24	129028	129,028	242,041	17%
O		76.7.3.2.1	76.7.3.2	36	6737.00	6736.48	0.0144	8	0.67	0.013	1.456	941,128		470,564		15	124	4,200	34,636	4.15	143828		0	143,828	326,736	15%		15	124	4200	34,636	4.15	143828	143,828	326,736	15%
O		76.7.3.2	76.7.3.1	389	6736.48	6729.75	0.0173	8	0.67	0.013	1.594	1,029,985		514,992		15	139	4,200	38,836	4.08	158342		0	158,342	356,650	15%		15	139	4200	38,836	4.08	158342	158,342	356,650	15%
O		76.7.3.1	76.7.3	295	6729.50	6725.00	0.0153	8	0.67	0.013	1.497	967,149		483,574		15	154	4,200	43,036	4.01	172607		0	172,607	310,967	18%		15	154	4200	43,036	4.01	172607	172,607	310,967	18%
O		76.7.3	76.7.2	208	6724.75	6722.25	0.0120	10	0.83	0.013	2.409	1,556,550		778,275		15	169	4,200	47,236	3.95	186651		0	186,651	591,625	12%		15	169	4200	47,236	3.95	186651	186,651	591,625	12%
O		76.7.2	76.7.1	374	6722.00	6715.00	0.0187	8	0.67	0.013	1.658	1,071,301		535,650		15	184	4,200	51,436	3.90	200495		0	200,495	335,155	19%		15	184	4200	51,436	3.90	200495	200,495	335,155	19%
O		76.7.1	76.7	349	6715.00	6710.50	0.0129	12	1.00	0.013	4.057	2,621,612		1,310,806		15	199	4,200	55,636	3.85	214160		0	214,160	1,096,646	8%		15	199	4200	55,636	3.85	214160	214,160	1,096,646	8%
O-3 BASIN TRUNK																																				

REACH	SUB REACH	Manhole U/S	Manhole D/S	Length (ft.)	Invert Elevations OUT	Invert Elevations IN	Pipe Slope	Pipe Diam. (in.)	Pipe Diam (ft.)	Mannings n	Q(full) (cfs)	Q(full) (gpd)	*Q(Allow) (cfs)	*Q(Allowable) (gpd)	Area (acres)	Existing (EQR)	Existing (Cum. EQR)	Existing Q-Ave (gpd)	Existing Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	I & I (gpd)	I & I Cumm.	Existing **IPF (gpd)	Existing Excess Capacity	Percent Capacity	Proposed (EQR)	Ultimate (EQR)	Ultimate (Cum. EQR)	Ultimate Q-Ave (gpd)	Ultimate Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	Ultimate IPF (gpd)	Ultimate Excess Capacity	Percent Capacity
O-3 BASIN TRUNK																																				
O	O-3	76.5.9.7.1	76.5.9.7	203	6886.96		0.0710	8	0.67	0.013	3.229	2,086,543		1,043,271		26	26	7,280	7,280	5.33	38800		0	38,800	1,004,472	2%	1	27	27	7560	7,560	5.30	40050	40,050	1,003,222	2%
O		76.5.9.7	76.5.9.6	270			0.0100	8	0.67	0.013	1.212	783,066		391,533		16	42	4,480	11,760	4.94	58047		0	58,047	333,485	7%		16	43	4480	12,040	4.92	59206	59,206	332,327	8%
O		76.5.9.6	76.5.9.5	286			0.0100	8	0.67	0.013	1.212	783,066		391,533		16	58	4,480	16,240	4.69	76126		0	76,126	315,407	10%		16	59	4480	16,520	4.67	77227	77,227	314,306	10%
O		76.5.9.5	76.5.9.4	373		6816.00	0.0100	8	0.67	0.013	1.212	783,066		391,533		16	74	4,480	20,720	4.51	93413		0	93,413	298,120	12%		16	75	4480	21,000	4.50	94472	94,472	297,061	12%
O		76.5.9.4	76.5.9.3	143	6816.00	6807.50	0.0594	8	0.67	0.013	2.954	1,909,148		954,574		16	90	4,480	25,200	4.37	110107		0	110,107	844,467	6%		16	91	4480	25,480	4.36	111134	111,134	843,440	6%
O		76.5.9.3	76.5.9.2	253	6806.25	6784.40	0.0864	8	0.67	0.013	3.561	2,301,249		1,150,624		16	106	4,480	29,680	4.26	126331		0	126,331	1,024,294	5%		16	107	4480	29,960	4.25	127331	127,331	1,023,293	6%
O		76.5.9.2	76.5.9	431	6784.08	6761.46	0.0525	8	0.67	0.013	2.776	1,793,931		896,966		16	122	4,480	34,160	4.16	142166		0	142,166	754,800	8%		16	123	4480	34,440	4.16	143144	143,144	753,822	8%
O		76.5.9	76.5.8	50	6761.72	6760.54	0.0236	8	0.67	0.013	1.861	1,202,968		601,484		16	138	4,480	38,640	4.08	157671		0	157,671	443,813	13%		16	139	4480	38,920	4.08	158630	158,630	442,854	13%
O		76.5.8	76.5.7	331	6760.20	6750.43	0.0295	8	0.67	0.013	2.082	1,345,338		672,669		16	154	4,480	43,120	4.01	172890		0	172,890	499,779	13%		16	155	4480	43,400	4.01	173833	173,833	498,836	13%
O		76.5.7	76.5.6	402	6750.11	6740.35	0.0243	8	0.67	0.013	1.888	1,220,141		610,070		16	170	4,480	47,600	3.95	187858		0	187,858	422,212	15%		16	171	4480	47,880	3.94	188786	188,786	421,285	15%
O		76.5.6	76.5.5	177	6740.13	6729.60	0.0595	8	0.67	0.013	2.955	1,909,966		954,983		16	186	4,480	52,080	3.89	202602		0	202,602	752,381	11%		16	187	4480	52,360	3.89	203516	203,516	751,467	11%
O		76.5.5	76.5.4	106	6729.60	6719.50	0.0953	8	0.67	0.013	3.740	2,417,163		1,208,581		16	202	4,480	56,560	3.84	217144		0	217,144	991,437	9%		16	203	4480	56,840	3.84	218047	218,047	990,535	9%
O		76.5.4	76.5.3	158	6716.50	6714.50	0.0127	8	0.67	0.013	1.363	881,018		440,509		16	218	4,480	61,040	3.79	231503		0	231,503	209,006	26%		16	219	4480	61,320	3.79	232394	232,394	208,114	26%
O-2 BASIN TRUNK																																				
O	O-2	76.5.3.11.1	76.5.3.11	266			0.0136	8	0.67	0.013	1.413	913,204		456,602		5	5	1,428	1,428	6.92	9877		0	9,877	446,725	1%	3	8	8	2268	2,268	6.42	14567	14,567	442,034	2%
O		76.5.3.11	76.5.3.10	167			0.0010	8	0.67	0.013	0.383	247,627		123,814		4	9	1,120	2,548	6.30	16064		0	16,064	107,750	6%		4	12	1120	3,388	6.02	20408	20,408	103,406	8%
O		76.5.3.10	76.5.3.9	180			0.0050	8	0.67	0.013	0.857	553,711		276,855		4	13	1,120	3,668	5.95	21815		0	21,815	255,040	4%		4	16	1120	4,508	5.75	25941	25,941	250,915	5%
O		76.5.3.9	76.5.3.8	243			0.0050	8	0.67	0.013	0.857	553,711		276,855		4	17	1,120	4,788	5.70	27288		0	27,288	249,568	5%		4	20	1120	5,628	5.55	31256	31,256	245,599	6%
O		76.5.3.8	76.5.3.7	344			0.0050	8	0.67	0.013	0.857	553,711		276,855		4	21	1,120	5,908	5.51	32557		0	32,557	244,298	6%		4	24	1120	6,748	5.39	36404	36,404	240,452	7%
O		76.5.3.7	76.5.3.5	369		6726.75	0.0050	8	0.67	0.013	0.857	553,711		276,855		4	25	1,120	7,028	5.36	37669		0	37,669	239,187	7%		4	28	1120	7,868	5.26	41416	41,416	235,440	7%
O		76.5.3.5	76.5.3.4	155	6726.75	6725.00	0.0113	8	0.67	0.013	1.287	832,054		416,027		4	29	1,120	8,148	5.23	42650		0	42,650	373,376	5%		4	32	1120	8,988	5.15	46314	46,314	369,712	6%
O		76.5.3.4	76.5.3.3	239	6723.75	6723.50	0.0010	8	0.67	0.013	0.392	253,261		126,631		4	33	1,120	9,268	5.13	47523		0	47,523	79,107	19%		4	36	1120	10,108	5.06	51116	51,116	75,515	20%
O		76.5.3.3	76.5.3.2	214	6720.00	6719.00	0.0047	8	0.67	0.013	0.828	535,293		267,646		4	37	1,120	10,388	5.03	52303		0	52,303	215,343	10%		4	40	1120	11,228	4.97	55833	55,833	211,813	10%
O		76.5.3.2	76.5.3.1	223	6719.00	6718.00	0.0045	8	0.67	0.013	0.811	524,379		262,190		4	41	1,120	11,508	4.95	57001		0	57,001	205,189	11%		4	44	1120	12,348	4.90	60476	60,476	201,714	12%
O		76.5.3.1	76.5.3	194	6718.00	6714.50	0.0180	8	0.67	0.013	1.627	1,051,795		525,898		4	45	1,120	12,628	4.88	61626		0	61,626	464,272	6%		4	48	1120	13,468	4.83	65051	65,051	460,847	6%
O	O-3	76.5.3	76.5.2	395	6714.50	6710.50	0.0101	12	1.00	0.013	3.595	2,323,305		1,161,653		218	263	61,040	73,668	3.68	271115		0	271,115	890,537	12%	1	219	267	61320	74,788	3.67	274573	274,573	887,079	12%
O		76.5.2	76.5.1	79	6710.50	6710.00	0.0063	12	1.00	0.013	2.842	1,836,734		918,367			263	0	73,668	3.68	271115		0	271,115	647,252	15%			267	0	74,788	3.67	274573	274,573	643,794	15%
O		76.5.1	76.5	146	6710.00	6708.25	0.0120	12	1.00	0.013	3.911	2,527,653		1,263,826			263	0	73,668	3.68	271115		0	271,115	992,711	11%			267	0	74,788	3.67	274573	274,573	989,253	11%
O-1 BASIN TRUNK																																				
O	O-1	76.3.8	76.3.7	370	6717.00	6714.75	0.0061	8	0.67	0.013	0.945	610,645		305,322		27	27	7,420	7,420	5.31	39426		0	39,426	265,897	6%	2	29	29	8008	8,008	5.25	42034	42,034	263,288	7%
O		76.3.7	76.3.6	380	6714.75	6713.00	0.0046	8	0.67	0.013	0.822	531,405		265,702		34	61	9,520	16,940	4.66	78873		0	78,873	186,830	15%		34	63	9520	17,528	4.63	81166	81,166	184,536	15%
O		76.3.6	76.3.5	250	6713.00		0.0120	8	0.67	0.013	1.327	857,805		428,903		34	95	9,520	26,460	4.34	114714		0	114,714	314,189	13%		34	97	9520	27,048	4.32	116851	116,851	312,051	14%
O		76.3.5	76.3.3	490		6707.75	0.0071	8	0.67	0.013	1.021	659,572		329,786		34	129	9,520	35,980	4.13	148502		0	148,502	181,284	23%		34	131	9520	36,568	4.12	150538	150,538	179,248	23%
O		76.3.3	76.3.2	320	6707.75	6704.50	0.0102	8	0.67	0.013	1.221	789,160		394,580		34	163	9,520	45,500	3.98	180871		0	180,871	213,709	23%		34	165	9520	46,088	3.97	182833	182,833	211,747	23%
O		76.3.2	76.3.1	358	6704.50	6700.00	0.0126	8	0.67	0.013	1.358	877,936		438,968		34	197	9,520	55,020	3.86	212167		0	212,167	226,801	24%		34	199	9520	55,608	3.85	214070	214,070	224,898	24%
O		76.3.1	76.3	29	6700.00	6698.00	0.0690	8	0.67	0.013	3.182	2,056,431		1,028,215		196	393	54,880	109,900	3.45	379383		0	379,383	648,832	18%		196	395	54880	110,488	3.45	381087	381,087	647,128	19%
N BASIN TRUNK																																				
N	N		73.2.13.5	26	6875.00	6870.31	0.1804	8	0.67	0.013	5.146	3,325,813		1,662,907		9	9	2,548	2,548	6.30	16064		0	16,064	1,646,843	0%		9	9	2548	2,548	6.30	16064	16,064	1,646,843	0%
N		73.2.13.5	73.2.13.4	104	6863.33	6847.28	0.1543	8	0.67	0.013	4.760	3,076,231		1,538,116		9	18	2,520	5,068	5.65	28622		0	28,622	1,509,493	1%		9	18	2520	5,068	5.65	28622	28,622	1,509,493	1%
N		73.2.13.4	73.2.13.3	156	6846.98	6833.06	0.0892	8	0.67	0.013	3.619	2,339,136		1,169,568		9	27	2,520	7,588	5.29	40174		0	40,174	1,129,394	2%		9	27	2520	7,588	5.29	40174	40,174	1,129,394	2%
N		73.2.13.3	73.2.13.2	23	6832.56	6829.31	0.1413	8	0.67	0.013	4.555	2,943,580		1,471,790		9	36	2,520	10,108	5.06	51116		0	51,116	1,420,674	2%		9	36	2520	10,108	5.06	51116	51,116	1,420,674	2%
N		73.2.13.2	73.2.13.1	306	6829.01	6806.46	0.0737	8	0.67	0.013	3.289	2,125,743		1,062,871		9	45	2,520	12,628	4.88	61626		0	61,626	1,001,246	3%		9	45	2520	12,628	4.88	61626	61,626	1,001,246	3%
N		73.2.13.1	73.2.13	127	6806.16	6787.76	0.1449	8	0.67	0.013	4.612	2,980,610		1,490,305		9	54	2,520	15,148	4.74	71802		0	71,802	1,418,503	2%		9	54	2520	15,148	4.74	71802	71,802	1,418,503	2%
N		73.2.13	73.2.12	231	6787.46		0.0489	8	0.67	0.013	2.679	1,731,445		865,722		100	154	28,000	43,148	4.01	172984		0	172,984	692,738	10%		100	154	28000	43,148	4.01	172984	172,984	692,738	10%
N		73.2.12	73.2.11	216			0.0489	8	0.67	0.013	2.679	1,731,620		865,810		9	163	2,520	45,668	3.97	181432		0	181,432	684,378	10%		9	163	2520	45,668	3.97	181432	181,432	684,378	10%
N		73.2.11	73.2.10	278		6752.00	0.0352	8	0.67	0.013	2.273	1,469,161		734,581		9	172	2,520	48,188	3.94	189805		0	189,805	544,775	13%		9	172	2520	48,188	3.94	189805	189,805	544,775	13%
N		73.2.10	73.2.9	128	6752.00	6746.00	0.0469	8	0.67	0.013	2.623	1,695,387		847,693		9	181	2,520	50,708	3.91	198109		0	198,109	649,584	12%		9	181	2520	50,708	3.91	198109	198,109	649,584	12%
N		73.2.9	73.2.8	200	6746.00	6736.00	0.0500	8	0.67	0.013	2.709	1,750,988		875,494		9	190	2,520	53,228	3.88	206347		0	206,347	669,147	12%		9	190	2520	53,228	3.88	206347	206,347	669,147	12%
N		73.2.8	73.2.7	210	6736.00	6728.00	0.0381	8	0.67	0.013	2.365	1,528,387		764,194		9	199	2,520	55,748	3.85	214522		0	214,522	549,671	14%		9	199	2520	55,748	3.85	214522	214,522	549,671	14%
N		73.2.7	73.2.6	274	6728.00	6700.00	0.1022	8	0.67	0.013	3.873	2,503,236		1,251,618		9	208	2,520	58,268	3.82	222639		0	222,639	1,028,979	9%		9	208	2520	58,268	3.82	222639	222,639	1,028,979	9%
N		73.2.6	73.2.5	28	6696.00	6694.50	0.0536	8	0.67	0.013	2.804	1,812,445		906,222		9	217	2,520	60,788	3.80	230700	6,000	6,000	236,700	669,523	13%		9	217	2520	60,788	3.80	230700	236,700	669,523	13%
N		73.2.5	73.2.4	155	6689.80	6688.00	0.0116	10	0.83	0.013	2.367	1,530,013		765,007		9	226	2,520	63,308	3.77	238707	6,000	12,000	250,707	514,300	16%		9	226	2520	63,308	3.77	238707	250,707	514,300	16%
N		73.2.4	73.2.3	40	6688.00	6687.75	0.0063	10	0.83	0.013	1.737	1,122,444		561,222		9	235	2,520	65,828	3.75	246663	6,000	18,000	264,663	296,559	24%	4	13	239	3640	66,948	3.74	250184	268,184	293,038	24%
N		73.2.3	73.2.2	150	6687.75	6686.50	0.0083	10	0.83	0.013	2.005	1,296,087		648,044		9	244	2,520	68,348	3.72	254571	6,000	24,000	278,571	369,472	21%	4	13	252	3640	70,588	3.71	261561	285,561	362,482	22%
N		73.2.2	73.2.1	98	6686.50	6685.50	0.0102	10	0.83	0.013	2.219	1,434,207		717,103		9	253	2,520	70,868	3.70	262433	7,000	31,000	293,433	423,671	20%	4	13	265	3640	74,228	3.68	272845	303,845	413,258	21%
N		73.2.1	73.2	157	6685.50		0.0090	12	1.00	0.013	3.389	2,190,262		1,095,131		9	262	2,520	73,388	3.68	270249		31,000	301,249	793,882	14%	4	13	278	3640	77,868	3.65	284041	315,041	780,090	14%
M-3A to M-2 BASIN TRUNK																																				
M	M-3A	60A.14.9	60A.14.8	266	6808.65	6783.35	0.0951	6	0.50	0.013	1.735	1,121,367		560,683		7	7	1,935	1,935	6.59	12747		0	12,747	547,936	1%	2	9	9	2579	2,579	6.29	16227	16,227	544,457	1%
M		60A.14.8	60A.14.7	104	6783.35	6772.50	0.1043	6	0.50	0.013	1.817	1,174,428		587,214		7	14	1,935	3,870	5.90	22818		0	22,818	564,396	2%		7	16	1935	4,514	5.75	25968	25,968	561,246	2%
M		60A.14.7	60A.14.6	165	6772.30	6759.25	0.0791	6	0.50	0.013	1.582	1,022,566		511,283		7	21	1,935	5,804	5.53	32077		0	32,077	479,206	3%		7	23	1935	6,448	5.43	35041	35,041	476,242	3%
M		60A.14.6	60A.14.5	150	6759.25	6756.45	0.0187	8	0.67	0.013	1.655	1,069,871		534,936		7	28	1,935	7,739	5.28	40846		0	40,846	494,090	4%		7	30	1935	8,383	5.21	43682	43,682	491,253	4%
M		60A.14.5	60A.14.4	326	6756.45	6754.50	0.0060	10	0.83	0.013	1.699	1,098,078		549,039		7	35	1,935	9,674	5.09	49266		0	49,266	499,773	4%		7	37	1935	10,318	5.04	52007	52,007	497,032	5%
M		60A.14.4	60A.14.3	83	6754.20	6749.80	0.0530	8	0.67	0.013	2.790	1,802,957		901,479		7	41	1,935	11,609	4.95	57420		0	57,420	844,059	3%		7	44	1935	12,253	4.90	60084	60,084	841,395	3%
M		60A.14.3	60A.14.2	150	6749.80	6737.80	0.0800	8	0.67	0.013	3.427	2,214,844		1,107,422		7	48	1,935	13,544	4.83	65358		0	65,358	1,042,064	3%		7	51	1935	14,188	4.79	67958	67,958	1,039,463	3%
M		60A.14.2	60A.14.1	231	6735.20	6717.30	0.0775	8	0.67	0.013	3.373	2,179,810		1,089,905		7	55	1,935	15,478	4.72	73116		0	73,116	1,016,789	3%		7	58	1935	16,122	4.69	75663	75,663	1,014,243	3%
M		60A.14.1	60A.14	180	6714.40	6698.40	0.0889	8	0.67	0.013	3.612	2,334,650		1,167,325		7	62	1,935	17,413	4.64	80719		0	80,719	1,086,606	3%		7	64	1935	18,057	4.61	83220	83,220	1,084,106	4%
M		60A.14	60A.13	91	6698.50	6697.90	0.0066	10	0.83	0.013	1.784	1,152,868		576,434		7	69	1,935	19,348	4.56	88189		0	88,189	488,245	8%		7	71	1935	19,992	4.53	90648	90,648	485,786	8%
M		60A.13	60A.12	268	6697.90	6694.70	0.0119	8	0.67	0.013	1.324	855,669		427,834			69	0	19,348	4.56	88189		0	88,189	339,645	10%			71	0	19,992	4.53	90648	90,648	337,186	11%
M		60A.12	60A.11	193	6694.65	6693.30	0.0070	8	0.67	0.013	1.013	654,917		327,459			69	0	19,348	4.56	88189		0	88,189	239,270	13%			71	0	19,992	4.53	90648	90,648	236,810	14%
M		60A.11	60A.10	177	6692.00	6690.25	0.0099	8	0.67	0.013	1.205	778,629		389,314			69	0	19,348	4.56	88189		0	88,189	301,126	11%			71	0	19,992	4.53	90648	90,648	298,666	12%
M		60A.10	60A.9	62	6690.25	6689.80	0.0073	10	0.83	0.013	1.872	1,209,582		604,791			69	0	19,348	4.56	88189		0	88,189	516,602	7%			71	0	19,992	4.53	90648	90,648	514,143	7%
M		60A.9	60A.8	325	6688.90	6683.30	0.0172	8	0.67	0.013	1.591	1,027,899		513,950			69	0	19,348	4.56	88189		0	88,189	425,761	9%			71	0	19,992	4.53	90648	90,648	423,301	9%
M		60A.8	60A.7	364	6683.30	6675.10	0.0225	8	0.67	0.013	1.819	1,175,315		587,658			69	0	19,348	4.56	88189		0	88,189	499,469	8%			71	0	19,992	4.53	90648	90,648	497,009	8%
M	M-2	60A.7	60A.6	30	6674.90	6674.40	0.0167	8	0.67	0.013	1.564	1,010,933		505,467		15	84	4,200	23,548	4.42	104011		0	104,011	401,455	10%	12	27	98	7560	27,552	4.31	118678	118,678	386,789	12%
M		60A.6	60A.5	379	6674.20	6667.70	0.0172	8	0.67	0.013	1.587	1,025,499		512,749		15	99	4,242	27,790	4.30	119538		0	119,538	393,211	12%	12	27	126	7602	35,154	4.14	145633	145,633	367,117	14%
M		60A.5	60A.4	302	6667.70	6665.40	0.0076	10	0.83	0.013	1.917	1,239,040		619,520		15	114	4,242	32,032	4.20	134688		0	134,688	484,831	11%	12	27	153	7602	42,756	4.01	171663	171,663	447,857	14%
M		60A.4	60A.3	273	6665.40	6663.75	0.0060	10	0.83	0.013	1.708	1,103,787		551,894		15	130	4,242	36,274	4.12	149520		0	149,520	402,374	14%	14	29	182	8162	50,918	3.90	198798	198,798	353,096	18%
M	M-1	60A.3	60A.3A	206	6663.65	6662.85	0.0039	10	0.83	0.013	1.369	884,782		442,391		23	152	6,384	42,658	4.02	171333		0	171,333	271,058	19%	3	26	208	7224	58,142	3.82	222234	222,234	220,156	25%
M		60A.3A	60A.2A	93	6662.85	6662.40	0.0048	10	0.83	0.013	1.528	987,619		493,810			152	0	42,658	4.02	171333		0	171,333	322,477	17%			208	0	58,142	3.82	222234	222,234	271,575	23%
M		60A.2A	60A.2	28	6662.30	6661.90	0.0143	10	0.83	0.013	2.626	1,696,976		848,488			152	0	42,658	4.02	171333		0	171,333	677,156	10%			208	0	58,142	3.82	222234	222,234	626,254	13%
M		60A.2	60A.1	291	6661.90	6661.10	0.0027	12	1.00	0.013	1.873	1,210,524		605,262			152	0	42,658	4.02	171333		0	171,333	433,929	14%			208	0	58,142	3.82	222234	222,234	383,027	18%
M		60A.1	60A	124	6660.95	6659.90	0.0085	12	1.00	0.013	3.287	2,124,509		1,062,255			152	0	42,658	4.02	171333		0	171,333	890,922	8%			208	0	58,142	3.82	222234	222,234	840,020	10%
M-3B																																				
M	M-3B	60A.10.4.2.5	60A.10.4.2.4	333	6790.64	6755.23	0.1063	8	0.67	0.013	3.951	2,553,518		1,276,759		7	7	1,999	1,999	6.55	13103		0	13,103	1,263,656	1%		7	7	1999	1,999	6.55	13103	13,103	1,263,656	1%
M		60A.10.4.2.4	60A.10.4.2.3	65	6755.16	6754.64	0.0080	8	0.67	0.013	1.084	700,395		350,198		7	14	1,999	3,998	5.87	23454		0	23,454	326,743	3%		7	14	1999	3,998	5.87	23454	23,454	326,743	3%
M		60A.10.4.2.3	60A.10.4.2.2	120	6754.51	6744.39	0.0843	8	0.67	0.013	3.519	2,274,038		1,137,019		7	21	1,999	5,998	5.50	32972		0	32,972	1,104,047	1%		7	21	1999	5,998	5.50	32972	32,972	1,104,047	1%
M		60A.10.4.2.2	60A.10.4.2	228	6744.19		0.0206	8	0.67	0.013	1.737	1,122,561		561,281		7	29	1,999	7,997	5.25	41985		0	41,985	519,296	4%		7	29	1999	7,997	5.25	41985	41,985	519,296	4%
M		60A.10.4.2	60A.10.4.1	335			0.0206	8	0.67	0.013	1.739	1,123,911		561,955		7	36	1,999	9,996	5.07	50640		0	50,640	511,315	5%		7	36	1999	9,996	5.07	50640	50,640	511,315	5%
M		60A.10.4.1	60A.10.4	183			0.0206	8	0.67	0.013	1.739	1,123,911		561,955		7	43	1,999	11,995	4.92	59021		0	59,021	502,934	5%		7	43	1999	11,995	4.92	59021	59,021	502,934	5%
M		60A.10.4	60A.10.3	144		6725.90	0.0370	8	0.67	0.013	2.331	1,506,257		753,128		7	50	1,999	13,994	4.80	67180		0	67,180	685,948	4%		7	50	1999	13,994	4.80	67180	67,180	685,948	4%
M		60A.10.3	60A.10.2	411	6725.90	6711.10	0.0360	8	0.67	0.013	2.299	1,485,963		742,982		7	57	1,999	15,994	4.70	75154		0	75,154	667,827	5%		7	57	1999	15,994	4.70	75154	75,154	667,827	5%
M		60A.10.2	60A.10.1	276	6711.10	6690.25	0.0755	8	0.67	0.013	3.330	2,152,269		1,076,135		7	64	1,999	17,993	4.61	82970		0	82,970	993,164	4%		7	64	1999	17,993	4.61	82970	82,970	993,164	4%
M		60A.10.1	60A.10	132	6690.25	6690.25	0.0420	8	0.67	0.013	2.483	1,604,807		802,403		7	71	1,999	19,992	4.53	90648		0	90,648	711,755	6%		7	71	1999	19,992	4.53	90648	90,648	711,755	6%
M-1 BASIN TRUNK (FORCE MAIN)																																				
L BASIN TRUNK																																				
L	L	63A.7.4	63A.7.3	260	6826.31	6818.88	0.0286	8	0.67	0.013	2.048	1,323,750		661,875		156	156	43,680	43,680	4.00	174774		0	174,774	487,101	13%	51	207	207	57960	57,960	3.82	221650	221,650	440,225	17%
L		63A.7.3	63A.7.2	275	6818.78	6810.60	0.0297	8	0.67	0.013	2.090	1,350,543		675,272			156	0	43,680	4.00	174774		0	174,774	500,497	13%			207	0	57,960	3.82	221650	221,650	453,622	16%
L		63A.7.2	63A.7.1	220	6810.50	6787.70	0.1036	8	0.67	0.013	3.901	2,520,892		1,260,446			156	0	43,680	4.00	174774		0	174,774	1,085,672	7%			207	0	57,960	3.82	221650	221,650	1,038,796	9%
L		63A.7.1	63A.7	220	6787.60	6766.90	0.0941	8	0.67	0.013	3.717	2,401,994		1,200,997			156	0	43,680	4.00	174774		0	174,774	1,026,223	7%			207	0	57,960	3.82	221650	221,650	979,347	9%
L		63A.7	63A.6	200	6766.80		0.0600	8	0.67	0.013	2.968	1,918,111		959,056			156	0	43,680	4.00	174774		0	174,774	784,281	9%			207	0	57,960	3.82	221650	221,650	737,406	12%
L		63A.6	63A.5	42			0.0575	8	0.67	0.013	2.905	1,877,725		938,863			156	0	43,680	4.00	174774		0	174,774	764,088	9%			207	0	57,960	3.82	221650	221,650	717,213	12%
L		63A.5	63A.4	161			0.0521	8	0.67	0.013	2.766	1,787,380		893,690			156	0	43,680	4.00	174774		0	174,774	718,916	10%			207	0	57,960	3.82	221650	221,650	672,040	12%
L		63A.4	63A.3	295			0.1028	8	0.67	0.013	3.885	2,510,699		1,255,350			156	0	43,680	4.00	174774		0	174,774	1,080,575	7%			207	0	57,960	3.82	221650	221,650	1,033,700	9%
L		63A.3	63A.2	125		6678.60	0.2016	8	0.67	0.013	5.440	3,515,956		1,757,978			156	0	43,680	4.00	174774		0	174,774	1,583,204	5%			207	0	57,960	3.82	221650	221,650	1,536,328	6%
L		63A.2	63A.1A	17	6678.60	6677.45	0.0676	8	0.67	0.013	3.151	2,036,679		1,018,339			156	0	43,680	4.00	174774		0	174,774	843,565	9%			207	0	57,960	3.82	221650	221,650	796,690	11%
L		63A.1A	63A.1	104	6677.15	6670.50	0.0639	8	0.67	0.013	3.064	1,980,123		990,062			156	0	43,680	4.00	174774		0	174,774	815,288	9%			207	0	57,960	3.82	221650	221,650	768,412	11%
L		63A.1	junc box	320	6670.50	6665.10	0.0169	15	1.25	0.013	8.414	5,437,802		3,806,462			156	0	43,680	4.00	174774		0	174,774	3,631,687	3%			207	0	57,960	3.82	221650	221,650	3,584,812	4%
K BASIN TRUNK																																				
K	K	56.6	56.5	200			0.0040	8	0.67	0.013	0.766	495,254		247,627		14	14	3,892	3,892	5.89	22929		0	22,929	224,698	5%	39	53	53	14812	14,812	4.76	70462	70,462	177,165	14%
K		56.5	56.4	333			0.0040	8	0.67	0.013	0.766	495,254		247,627			14	0	3,892	5.89	22929		0	22,929	224,698	5%			53	0	14,812	4.76	70462	70,462	177,165	14%
K		56.4	56.3	296			0.0040	8	0.67	0.013	0.766	495,254		247,627			14	0	3,892	5.89	22929		0	22,929	224,698	5%			53	0	14,812	4.76	70462	70,462	177,165	14%
K		56.3	56.2	132			0.0130	8	0.67	0.013	1.382	892,832		446,416			14	0	3,892	5.89	22929		0	22,929	423,487	3%			53	0	14,812	4.76	70462	70,462	375,954	8%
K		56.2	56.1	103			0.0493	8	0.67	0.013	2.690	1,738,688		869,344			14	0	3,892	5.89	22929		0	22,929	846,415	1%			53	0	14,812	4.76	70462	70,462	798,882	4%

REACH	SUB REACH	Manhole U/S	Manhole D/S	Length (ft.)	Invert Elevations OUT	Invert Elevations IN	Pipe Slope	Pipe Diam. (in.)	Pipe Diam (ft.)	Mannings n	Q(full) (cfs)	Q(full) (gpd)	*Q(Allow) (cfs)	*Q(Allowable) (gpd)	Area (acres)	Existing (EQR)	Existing (Cum. EQR)	Existing Q-Ave (gpd)	Existing Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	I & I (gpd)	I & I Cumm.	Existing **IPF (gpd)	Existing Excess Capacity	Percent Capacity	Proposed (EQR)	Ultimate (EQR)	Ultimate (Cum. EQR)	Ultimate Q-Ave (gpd)	Ultimate Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	Ultimate IPF (gpd)	Ultimate Excess Capacity	Percent Capacity
K		56.1	56	164			0.0040	8	0.67	0.013	0.766	495,254		247,627			14	0	3,892	5.89	22929		0	22,929	224,698	5%			53	0	14,812	4.76	70462	70,462	177,165	14%
J-3 BASIN TRUNK																																				
J	J-3	48.4.33.5	48.4.33.4	225	6866.50	6860.69	0.0258	8	0.67	0.013	1.947	1,258,331		629,166		8	8	2,324	2,324	6.40	14869		0	14,869	614,297	1%	28	36	36	10136	10,136	5.05	51235	51,235	577,930	4%
J		48.4.33.4	48.4.33.3	110	6860.69	6859.00	0.0154	8	0.67	0.013	1.502	970,611		485,305		6	14	1,680	4,004	5.86	23482		0	23,482	461,823	2%	20	26	62	7280	17,416	4.64	80730	80,730	404,575	8%
J		48.4.33.3	48.4.33.2	68	6853.35	6852.35	0.0147	8	0.67	0.013	1.469	949,606		474,803		6	20	1,680	5,684	5.54	31517		0	31,517	443,286	3%	20	26	88	7280	24,696	4.38	108255	108,255	366,549	11%
J		48.4.33.2	48.4.33.1	264	6852.35	6842.40	0.0377	8	0.67	0.013	2.352	1,520,224		760,112		6	26	1,680	7,364	5.32	39176		0	39,176	720,937	3%	20	26	114	7280	31,976	4.21	134491	134,491	625,622	9%
J		48.4.33.1	48.4.33	175	6842.40	6838.00	0.0251	8	0.67	0.013	1.921	1,241,668		620,834		6	32	1,680	9,044	5.15	46557		0	46,557	574,277	4%		6	120	1680	33,656	4.17	140402	140,402	480,432	11%
J		48.4.33	48.4.32	111	6837.50	6828.50	0.0811	8	0.67	0.013	3.450	2,229,759		1,114,879		6	38	1,680	10,724	5.01	53720		0	53,720	1,061,159	2%		6	126	1680	35,336	4.14	146266	146,266	968,614	7%
J		48.4.32	48.4.31	282	6828.50		0.0400	8	0.67	0.013	2.423	1,566,131		783,066		6	44	1,680	12,404	4.89	60706		0	60,706	722,360	4%		6	132	1680	37,016	4.11	152085	152,085	630,980	10%
J		48.4.31	48.4.30	119			0.0050	8	0.67	0.013	0.857	553,711		276,855		6	50	1,680	14,084	4.80	67541		0	67,541	209,314	12%		6	138	1680	38,696	4.08	157863	157,863	118,993	29%
J		48.4.30	48.4.29	119			0.0070	8	0.67	0.013	1.014	655,160		327,580		6	56	1,680	15,764	4.71	74247		0	74,247	253,333	11%		6	144	1680	40,376	4.05	163600	163,600	163,980	25%
J		48.4.29	48.4.28	90			0.0070	8	0.67	0.013	1.014	655,160		327,580		6	62	1,680	17,444	4.63	80839		0	80,839	246,741	12%		6	150	1680	42,056	4.03	169299	169,299	158,280	26%
J		48.4.28	48.4.27	193			0.0620	8	0.67	0.013	3.017	1,949,818		974,909		6	68	1,680	19,124	4.57	87330		0	87,330	887,578	4%		6	156	1680	43,736	4.00	174962	174,962	799,946	9%
J		48.4.27	48.4.26	121			0.1040	8	0.67	0.013	3.908	2,525,311		1,262,655		6	74	1,680	20,804	4.51	93731		0	93,731	1,168,924	4%		6	162	1680	45,416	3.98	180591	180,591	1,082,065	7%
J		48.4.26	48.4.25	396			0.0710	8	0.67	0.013	3.229	2,086,543		1,043,271		6	80	1,680	22,484	4.45	100049		0	100,049	943,222	5%		6	168	1680	47,096	3.95	186186	186,186	857,086	9%
J		48.4.25	48.4.24	188			0.0740	8	0.67	0.013	3.296	2,130,169		1,065,084		6	86	1,680	24,164	4.40	106292		0	106,292	958,792	5%		6	174	1680	48,776	3.93	191749	191,749	873,335	9%
J		48.4.24	48.4.23	280			0.0340	8	0.67	0.013	2.234	1,443,902		721,951		6	92	1,680	25,844	4.35	112466		0	112,466	609,485	8%		6	180	1680	50,456	3.91	197282	197,282	524,669	14%
J		48.4.23	48.4.22	201			0.0680	8	0.67	0.013	3.160	2,041,985		1,020,993		6	98	1,680	27,524	4.31	118576		0	118,576	902,416	6%		6	186	1680	52,136	3.89	202785	202,785	818,208	10%
J		48.4.22	48.4.21	201			0.0201	8	0.67	0.013	1.718	1,110,187		555,094		6	104	1,680	29,204	4.27	124627		0	124,627	430,467	11%		6	192	1680	53,816	3.87	208260	208,260	346,834	19%
J		48.4.21	48.4.20	397			0.0179	8	0.67	0.013	1.621	1,047,670		523,835		6	110	1,680	30,884	4.23	130622		0	130,622	393,213	12%		6	198	1680	55,496	3.85	213707	213,707	310,128	20%
J		48.4.20	48.4.19	62			0.0081	8	0.67	0.013	1.090	704,759		352,379		6	116	1,680	32,564	4.19	136565		0	136,565	215,814	19%		6	204	1680	57,176	3.83	219129	219,129	133,251	31%
J		48.4.19	48.4.18	400		6711.22	0.0067	8	0.67	0.013	0.992	640,967		320,483		7	123	1,960	34,524	4.15	143437		0	143,437	177,046	22%		7	211	1960	59,136	3.81	225422	225,422	95,062	35%
J		48.4.18	48.4.17	402	6711.02	6708.31	0.0067	8	0.67	0.013	0.995	642,939		321,469		7	130	1,960	36,484	4.12	150247		0	150,247	171,222	23%		7	218	1960	61,096	3.79	231681	231,681	89,788	36%
J		48.4.17	48.4.16	163	6708.11	6706.73	0.0085	8	0.67	0.013	1.115	720,516		360,258		7	137	1,960	38,444	4.08	156999		0	156,999	203,260	22%		7	225	1960	63,056	3.77	237909	237,909	122,350	33%
J		48.4.16	48.4.15	63	6706.53		0.0095	8	0.67	0.013	1.181	763,238		381,619		7	144	1,960	40,404	4.05	163695		0	163,695	217,924	21%		7	232	1960	65,016	3.75	244105	244,105	137,514	32%
J		48.4.15	48.4.14	248		6691.70	0.0532	8	0.67	0.013	2.795	1,806,150		903,075		7	151	1,960	42,364	4.02	170340		0	170,340	732,735	9%		7	239	1960	66,976	3.74	250272	250,272	652,803	14%
J		48.4.14	48.4.13	382	6691.12		0.0165	10	0.83	0.013	2.822	1,823,756		911,878		7	158	1,960	44,324	3.99	176936		0	176,936	734,942	10%		7	246	1960	68,936	3.72	256410	256,410	655,468	14%
J		48.4.13	48.4.12.1	190		6682.15	0.0176	10	0.83	0.013	2.915	1,883,567		941,784		7	165	1,960	46,284	3.96	183485		0	183,485	758,298	10%		7	253	1960	70,896	3.70	262520	262,520	679,264	14%
J		48.4.12.1	48.4.12	190	6681.70		0.0176	10	0.83	0.013	2.915	1,883,567		941,784		7	172	1,960	48,244	3.94	189991		0	189,991	751,793	10%		7	260	1960	72,856	3.69	268603	268,603	673,181	14%
J		48.4.12	48.4.11	235			0.0094	10	0.83	0.013	2.130	1,376,540		688,270		7	179	1,960	50,204	3.91	196454		0	196,454	491,816	14%		7	267	1960	74,816	3.67	274660	274,660	413,610	20%
J		48.4.11	48.4.10	405			0.0090	10	0.83	0.013	2.084	1,346,933		673,467		7	186	1,960	52,164	3.89	202876		0	202,876	470,590	15%	28	35	302	9772	84,588	3.60	304494	304,494	368,972	23%
J		48.4.10	48.4.9.1	395		6669.50	0.0070	10	0.83	0.013	1.838	1,187,883		593,942		7	193	1,960	54,124	3.87	209261		0	209,261	384,681	18%	20	27	329	7560	92,148	3.55	327196	327,196	266,746	28%
J		48.4.9.1	48.4.9	39	6669.10		0.0050	10	0.83	0.013	1.553	1,003,945		501,972		7	200	1,960	56,084	3.84	215608		0	215,608	286,365	21%	20	27	356	7560	99,708	3.51	349601	349,601	152,371	35%
J		48.4.9	48.4.8	84			0.0180	10	0.83	0.013	2.947	1,904,851		952,426		7	207	1,960	58,044	3.82	221920		0	221,920	730,506	12%	20	27	383	7560	107,268	3.47	371736	371,736	580,690	20%
J		48.4.8	48.4.7	294			0.0060	12	1.00	0.013	2.767	1,788,341		894,171		7	214	1,960	60,004	3.80	228198		0	228,198	665,973	13%		7	390	1960	109,228	3.46	377433	377,433	516,737	21%
J		48.4.7	48.4.6	182			0.0099	12	1.00	0.013	3.554	2,297,166		1,148,583		7	221	1,960	61,964	3.78	234443		0	234,443	914,140	10%		7	397	1960	111,188	3.45	383114	383,114	765,469	17%
J		48.4.6	48.4.5	376			0.0100	12	1.00	0.013	3.572	2,308,739		1,154,369		7	228	1,960	63,924	3.76	240656		0	240,656	913,713	10%		7	404	1960	113,148	3.44	388779	388,779	765,590	17%
J	J-1	48.4.5	48.4.4	386			0.0026	12	1.00	0.013	1.822	1,177,230		588,615		80	308	22,400	86,324	3.59	309735		0	309,735	278,880	26%	20	100	504	28000	141,148	3.32	468130	468,130	120,485	40%
J		48.4.4	48.4.3	336			0.0022	12	1.00	0.013	1.676	1,082,895		541,447			308	0	86,324	3.59	309735		0	309,735	231,712	29%			504	0	141,148	3.32	468130	468,130	73,317	43%
J		48.4.3	48.4.2	70			0.0045	12	1.00	0.013	2.396	1,548,749		774,375			308	0	86,324	3.59	309735		0	309,735	464,640	20%			504	0	141,148	3.32	468130	468,130	306,244	30%
J		48.4.2	48.4.1	424			0.0034	12	1.00	0.013	2.083	1,346,215		673,107			308	0	86,324	3.59	309735		0	309,735	363,372	23%			504	0	141,148	3.32	468130	468,130	204,977	35%
J		48.4.1	48.4	419			0.0031	12	1.00	0.013	1.989	1,285,451		642,726			308	0	86,324	3.59	309735		0	309,735	332,991	24%			504	0	141,148	3.32	468130	468,130	174,596	36%
J	J-2	48.4	48.3	317			0.0055	15	1.25	0.013	4.804	3,104,437		2,173,106		195	504	54,684	141,008	3.32	467740		0	467,740	1,705,366	15%	91	286	790	80080	221,228	3.09	682819	682,819	1,490,287	22%
J		48.3	48.2	150			0.0367	16	1.33	0.013	14.739	9,525,281		6,667,697			504	0	141,008	3.32	467740		0	467,740	6,199,957	5%			790	0	221,228	3.09	682819	682,819	5,984,878	7%
J		48.2	48.1A	273			0.0030	16	1.33	0.013	4.214	2,723,362		1,906,354			504	0	141,008	3.32	467740		0	467,740	1,438,613	17%			790	0	221,228	3.09	682819	682,819	1,223,535	25%
																		0																		
J-2 BASIN TRUNK																		0																		
																		0																		
J	J-2	48.12.9	48.12.8	312			0.0290	8	0.67	0.013	2.063	1,333,513		666,756		35	35	9,884	9,884	5.08	50163		0	50,163	616,593	4%	91	126	126	35280	35,280	4.14	146071	146,071	520,685	11%
J		48.12.8	48.12.7	221			0.0134	8	0.67	0.013	1.403	906,464		453,232		10	45	2,800	12,684	4.88	61855		0	61,855	391,377	7%		10	136	2800	38,080	4.09	155749	155,749	297,483	17%
J		48.12.7	48.12.6	245			0.0260	8	0.67	0.013	1.954	1,262,655		631,328		10	55	2,800	15,484	4.72	73138		0	73,138	558,190	6%		10	146	2800	40,880	4.04	165314	165,314	466,014	13%
J		48.12.6	48.12.5	182			0.0450	8	0.67	0.013	2.570	1,661,133		830,566		10	65	2,800	18,284	4.60	84097		0	84,097	746,470	5%		10	156	2800	43,680	4.00	174774	174,774	655,792	11%
J		48.12.5	48.12.4	302			0.0390	8	0.67	0.013	2.393	1,546,431		773,215		10	75	2,800	21,084	4.50	94790		0	94,790	678,426	6%		10	166	2800	46,480	3.96	184138	184,138	589,077	12%
J		48.12.4	48.12.3	220			0.0330	8	0.67	0.013	2.201	1,422,509		711,255		10	85	2,800	23,884	4.41	105257		0	105,257	605,998	7%		10	176	2800	49,280	3.92	193412	193,412	517,843	14%
J		48.12.3	48.12.2	151			0.0290	8	0.67	0.013	2.063	1,333,513		666,756		10	95	2,800	26,684	4.33	115529		0	115,529	551,227	9%		10	186	2800	52,080	3.89	202602	202,602	464,154	15%
J		48.12.2	48.12.1	200			0.0517	8	0.67	0.013	2.755	1,780,506		890,253		10	105	2,800	29,484	4.26	125630		0	125,630	764,623	7%		10	196	2800	54,880	3.86	211713	211,713	678,540	12%
J		48.12.1	48.12	375			0.0134	8	0.67	0.013	1.403	906,464		453,232			105	0	29,484	4.26	125630		0	125,630	327,602	14%			196	0	54,880	3.86	211713	211,713	241,519	23%
J		48.12	48.11A	180		6686.06	0.0270	8	0.67	0.013	1.991	1,286,708		643,354		10	115	2,800	32,284	4.20	135578		0	135,578	507,776	11%		10	206	2800	57,680	3.83	220750	220,750	422,604	17%
J		48.11A	48.11	61	6685.86		0.0050	8	0.67	0.013	0.857	553,711		276,855		10	125	2,800	35,084	4.14	145389		0	145,389	131,467	26%		10	216	2800	60,480	3.80	229717	229,717	47,138	41%
J		48.11	48.10	350			0.0320	8	0.67	0.013	2.167	1,400,790		700,395		10	135	2,800	37,884	4.09	155075		0	155,075	545,320	11%		10	226	2800	63,280	3.77	238618	238,618	461,777	17%
J		48.10	48.9	197			0.0160	8	0.67	0.013	1.533	990,508		495,254		10	145	2,800	40,684	4.05	164648		0	164,648	330,606	17%		10	236	2800	66,080	3.74	247456	247,456	247,798	25%
J		48.9	48.8	360			0.0100	8	0.67	0.013	1.212	783,066		391,533		10	155	2,800	43,484	4.00	174115		0	174,115	217,418	22%		10	246	2800	68,880	3.72	256235	256,235	135,298	33%
J		48.8	48.7	175			0.0400	8	0.67	0.013	2.423	1,566,131		783,066		10	165	2,800	46,284	3.96	183485		0	183,485	599,580	12%		10	256	2800	71,680	3.70	264956	264,956	518,109	17%
J		48.7	48.6	398			0.0032	10	0.83	0.013	1.243	803,156		401,578		10	175	2,800	49,084	3.93	192766		0	192,766	208,812	24%		10	266	2800	74,480	3.67	273623	273,623	127,955	34%
J		48.6	48.5	270			0.0030	10	0.83	0.013	1.203	777,652		388,826		10	185	2,800	51,884	3.89	201961		0	201,961	186,865	26%		10	276	2800	77,280	3.65	282238	282,238	106,588	36%
J		48.5	48.4	80			0.0120	10	0.83	0.013	2.407	1,555,305		777,652		10	195	2,800	54,684	3.86	211078		0	211,078	566,575	14%		10	286	2800	80,080	3.63	290804	290,804	486,849	19%
J-1 BASIN TRUNK																																				
J	J-1	48.1A.7	48.1A.6A	131			0.0040	8	0.67	0.013	0.766	495,254		247,627		20	20	5,600	5,600	5.56	31126	5,000	5,000	36,126	211,501	7%	108	128	128	35728	35,728	4.13	147627	152,627	95,000	31%
J		48.1A.6A	48.1A.6	269			0.0040	8	0.67	0.013	0.766	495,254		247,627		20	40	5,600	11,200	4.97	55716	5,000	10,000	65,716	181,911	13%		20	148	5600	41,328	4.04	166834	176,834	70,793	36%
J		48.1A.6	48.1A.5	82		6652.16	0.0050	8	0.67	0.013	0.857	553,711		276,855		20	60	5,600	16,800	4.66	78325	5,000	15,000	93,325	183,531	17%		20	168	5600	46,928	3.96	185628	200,628	76,228	36%
J		48.1A.5	48.1A.4	240	6652.16		0.0050	8	0.67	0.013	0.857	553,711		276,855		20	80	5,600	22,400	4.45	99735	5,000	20,000	119,735	157,120	22%		20	188	5600	52,528	3.88	204065	224,065	52,791	40%
J		48.1A.4	48.1A.3	398			0.0040	8	0.67	0.013	0.766	495,254		247,627		20	100	5,600	28,000	4.30	120296	5,000	25,000	145,296	102,331	29%		20	208	5600	58,128	3.82	222189	247,189	438	50%
J		48.1A.3	48.1A.2	327			0.0040	8	0.67	0.013	0.766	495,254		247,627		20	120	5,600	33,600	4.17	140205	5,000	30,000	170,205	77,422	34%		20	228	5600	63,728	3.77	240036	270,036	-22,409	55%
J		48.1A.2	48.1A.1	398			0.0040	8	0.67	0.013	0.766	495,254		247,627		20	140	5,600	39,200	4.07	159588	5,000	35,000	194,588	53,039	39%		20	248	5600	69,328	3.72	257634	292,634	-45,007	59%
J		48.1A.1	48.1A	35			0.0040	8	0.67	0.013	0.766	495,254		247,627		29	169	8,036	47,236	3.95	186651	15,000	50,000	236,651	10,977	48%		29	276	8036	77,364	3.65	282496	332,496	-84,869	67%
J	J-3 + J-2	48.1A	48.1	143			0.0030	16	1.33	0.013	4.214	2,723,362		1,906,354		504	672	141,008	188,244	3.17	596219	10,000	60,000	656,219	1,250,135	24%	267	770	1046	215628	292,992	2.95	864567	924,567	981,787	34%
J		48.1	48	90			0.0044	15	1.25	0.013	4.296	2,776,693		1,943,685			672	0	188,244	3.17	596219	60,000	120,000	716,219	1,227,466	26%			1046	0	292,992	2.95	864567	984,567	959,118	35%
H BASIN TRUNK																																				
H	H	POSSIBLE MISSING LINE								0.013	0.000	0		0		20	20	5,600	5,600	5.56	31126		0	31,126	-31,126			20	20	5600	5,600	5.56	31126	31,126	-31,126	
H		44.10	44.9	559			0.0012	6	0.50	0.013	0.195	125,956		62,978		20	40	5,600	11,200	4.97	55716		0	55,716	7,262	44%		20	40	5600	11,200	4.97	55716	55,716	7,262	44%
H		44.9	44.8	58			0.0050	6	0.50	0.013	0.398	257,107		128,553		20	60	5,600	16,800	4.66	78325		0	78,325	50,228			20	60	5600	16,800	4.66	78325	78,325	50,228	
H		44.8	44.7	382			0.0050	6	0.50	0.013	0.398	257,107		128,553		14	74	3,948	20,748	4.51	93519		0	93,519	35,034			14	74	3948	20,748	4.51	93519	93,519	35,034	
H		44.7	44.6	84			0.0050	6	0.50	0.013	0.398	257,107		128,553			74	0	20,748	4.51	93519		0	93,519	35,034				74	0	20,748	4.51	93519	93,519	35,034	
H		44.6	44.5	271			0.0253	6	0.50	0.013	0.895	578,347		289,173			74	0	20,748	4.51	93519		0	93,519	195,654				74	0	20,748	4.51	93519	93,519	195,654	
H		44.5	44.4	224			0.0041	8	0.67	0.013	0.776	501,407		250,703			74	0	20,748	4.51	93519		0	93,519	157,184	19%			74	0	20,748	4.51	93519	93,519	157,184	19%
H		44.4	44.3	288			0.0041	8	0.67	0.013	0.776	501,407		250,703			74	0	20,748	4.51	93519		0	93,519	157,184	19%			74	0	20,748	4.51	93519	93,519	157,184	19%
H		44.3	44.2	194			0.0040	8	0.67	0.013	0.766	495,254		247,627			74	0	20,748	4.51	93519		0	93,519	154,108	19%			74	0	20,748	4.51	93519	93,519	154,108	19%
H		44.2	44.1	219			0.0050	8	0.67	0.013	0.857	553,711		276,855			74	0	20,748	4.51	93519		0	93,519	183,336	17%			74	0	20,748	4.51	93519	93,519	183,336	17%
H		44.1	44	30		6631.86	0.0040	8	0.67	0.013	0.766	495,254		247,627			74	0	20,748	4.51	93519		0	93,519	154,108	19%			74	0	20,748	4.51	93519	93,519	154,108	19%
H																																				
G BASIN TRUNK																																				
G	G	42.8	42.7	187			0.0060	8	0.67	0.013	0.939	606,560		303,280		8	8	2,100	2,100	6.50	13655		0	13,655	289,625	2%	63	70	70	19712	19,712	4.54	89581	89,581	213,699	15%
G		42.7	42.6	298			0.0400	8	0.67	0.013	2.423	1,566,131		783,066		8	16	2,240	4,340	5.79	25126		0	25,126	757,939	2%		8	78	2240	21,952	4.47	98057	98,057	685,009	6%
G		42.6	42.5	139			0.0050	8	0.67	0.013	0.857	553,711		276,855		8	24	2,240	6,580	5.42	35641		0	35,641	241,215	6%		8	86	2240	24,192	4.40	106396	106,396	170,460	19%
G		42.5	42.4	110			0.0050	8	0.67	0.013	0.857	553,711		276,855		8	32	2,240	8,820	5.17	45586		0	45,586	231,269	8%		8	94	2240	26,432	4.34	114612	114,612	162,244	21%
G		42.4	42.3	163			0.0050	8	0.67	0.013	0.857	553,711		276,855		8	40	2,240	11,060	4.98	55131		0	55,131	221,725	10%		8	102	2240	28,672	4.28	122717	122,717	154,139	22%
G		42.3	42.2	185			0.0040	8	0.67	0.013	0.766	495,254		247,627		8	48	2,240	13,300	4.84	64369		0	64,369	183,258	13%		8	110	2240	30,912	4.23	130721	130,721	116,906	26%
G		42.2	42.1	15			0.0050	8	0.67	0.013	0.857	553,711		276,855		8	56	2,240	15,540	4.72	73360		0	73,360	203,496	13%		8	118	2240	33,152	4.18	138633	138,633	138,222	25%
G		42.1	42.A	48			0.0050	8	0.67	0.013	0.857	553,711		276,855		8	64	2,240	17,780	4.62	82145		0	82,145	194,710	15%		8	126	2240	35,392	4.14	146460	146,460	130,395	26%
G		42.A	42	30		6631.10	0.0014	8	0.67	0.013	0.453	292,996		146,498		8	72	2,240	20,020	4.53	90755		0	90,755	55,743	31%		8	134	2240	37,632	4.10	154208	154,208	-7,710	53%
F BASIN TRUNK																																				
F	E&SB 700	32A.4	32A.3	294	6619.10	6616.82	0.0078	15	1.25	0.013	5.704	3,686,339		2,580,437		246	246	68,936	68,936	3.72	256410		0	256,410	2,324,028	7%	3933	4179	4179	1170176	1,170,176	2.36	2766756	2,766,756	-186,318	75%
F	F	32A.3	32A.2	299	6616.56	6613.92	0.0088	15	1.25	0.013	6.086	3,933,398		2,753,379		133	379	37,100	106,036	3.47	368146		0	368,146	2,385,232	9%		133	4312	37100	1,207,276	2.35	2840255	2,840,255	-86,876	72%
F		32A.2	32A.1	82	6613.75	6611.25	0.0305	12	1.00	0.013	6.238	4,031,233		2,015,616			379	0	106,036	3.47	368146		0	368,146	1,647,470	9%			4312	0	1,207,276	2.35	2840255	2,840,255	-824,638	70%
F		32A.1	32A	206	6610.75	6610.20	0.0027	15	1.25	0.013	3.347	2,162,964		1,514,075			379	0	106,036	3.47	368146		0	368,146	1,145,928	17%			4312	0	1,207,276	2.35	2840255	2,840,255	-1,326,180	131%
MAIN TRUNK NORTH																																				
	S+Q-1+Q-2	73.12	73.11	400			0.0050	12	1.00	0.013	2.526	1,632,525		816,262		1067	1067	298,704	298,704	2.94	878703		0	878,703	-62,441	54%	2	1069	1069	299264	299,264	2.94	880087	880,087	-63,824	54%
		73.11	73.10	305			0.0050	12	1.00	0.013	2.526	1,632,525		816,262			1067	0	298,704	2.94	878703		0	878,703	-62,441	54%			1069	0	299,264	2.94	880087	880,087	-63,824	54%
		73.10	73.9	436		6695.30	0.0140	15	1.25	0.013	7.664	4,952,968		3,467,078			1067	0	298,704	2.94	878703		0	878,703	2,588,374	18%			1069	0	299,264	2.94	880087	880,087	2,586,991	18%
		73.9	73.8	357	6695.30		0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			1067	0	298,704	2.94	878703		0	878,703	1,193,272	30%			1069	0	299,264	2.94	880087	880,087	1,191,888	30%
		73.8	73.8.A			6693.50	0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			1067	0	298,704	2.94	878703		0	878,703	1,193,272	30%			1069	0	299,264	2.94	880087	880,087	1,191,888	30%
	O-6	73.8.A	73.7	385	6693.50	6691.50	0.0052	15	1.25	0.013	4.668	3,017,075		2,111,953		153	1220	42,924	341,628	2.88	983614		0	983,614	1,128,339	33%	6	160	1228	44660	343,924	2.88	989164	989,164	1,122,789	33%
		73.7	73.6	390	6691.50	6690.00	0.0038	15	1.25	0.013	4.017	2,596,061		1,817,242			1220	0	341,628	2.88	983614		0	983,614	833,628	38%			1228	0	343,924	2.88	989164	989,164	828,079	38%
		73.6	73.5	380	6690.00		0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			1220	0	341,628	2.88	983614		0	983,614	1,088,361	33%			1228	0	343,924	2.88	989164	989,164	1,082,811	33%
		73.5	73.4	358			0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			1220	0	341,628	2.88	983614	471,000	471,000	1,454,614	617,361	49%			1228	0	343,924	2.88	989164	1,460,164	611,811	49%
		73.4	73.3	23			0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			1220	0	341,628	2.88	983614		471,000	1,454,614	617,361	49%			1228	0	343,924	2.88	989164	1,460,164	611,811	49%
		73.3	73.3	350			0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			1220	0	341,628	2.88	983614		471,000	1,454,614	617,361	49%			1228	0	343,924	2.88	989164	1,460,164	611,811	49%

REACH	SUB REACH	Manhole U/S	Manhole D/S	Length (ft.)	Invert Elevations OUT	Invert Elevations IN	Pipe Slope	Pipe Diam. (in.)	Pipe Diam (ft.)	Mannings n	Q(full) (cfs)	Q(full) (gpd)	*Q(Allow) (cfs)	*Q(Allowable) (gpd)	Area (acres)	Existing (EQR)	Existing (Cum. EQR)	Existing Q-Ave (gpd)	Existing Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	I & I (gpd)	I & I Cumm.	Existing **IPF (gpd)	Existing Excess Capacity	Percent Capacity	Proposed (EQR)	Ultimate (EQR)	Ultimate (Cum. EQR)	Ultimate Q-Ave (gpd)	Ultimate Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	Ultimate IPF (gpd)	Ultimate Excess Capacity	Percent Capacity
		73.3	73.2	24			0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			1220	0	341,628	2.88	983614		471,000	1,454,614	617,361	49%			1228	0	343,924	2.88	989164	1,460,164	611,811	49%
	N	73.2	73.1	224			0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975		262	1482	73,388	415,016	2.79	1158282	31,000	502,000	1,660,282	411,693	56%	16	278	1506	77868	421,792	2.78	1174147	1,676,147	395,828	57%
		73.1	JB3	328			0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			1482	0	415,016	2.79	1158282		502,000	1,660,282	411,693	56%			1506	0	421,792	2.78	1174147	1,676,147	395,828	57%
SERIES OF JUNCTION AND SPLITTER BOXES	JUNCTION BOX (LINES DIVERGE)																																			
		JB3	73.A	18		6679.86	0.0050	18	1.50	0.013	7.448	4,813,229		3,369,260		6635	6635	1,857,763	1,857,763	2.20	4079357		0	4,079,357	-710,096	85%	2259	8894	8894	2490327	2,490,327	2.10	5217892	5,217,892	-1,848,632	108%
		73.A	72A	290	6679.76	6678.28	0.0051	18	1.50	0.013	7.524	4,862,766		3,403,936			6635	0	1,857,763	2.20	4079357		0	4,079,357	-675,420	84%			8894	0	2,490,327	2.10	5217892	5,217,892	-1,813,956	107%
		72A	71A	362	6678.23	6676.30	0.0053	18	1.50	0.013	7.691	4,970,223		3,479,156			6635	0	1,857,763	2.20	4079357		0	4,079,357	-600,201	82%			8894	0	2,490,327	2.10	5217892	5,217,892	-1,738,736	105%
		71A	70A	302	6676.20	6674.78	0.0047	18	1.50	0.013	7.222	4,667,585		3,267,309			6635	0	1,857,763	2.20	4079357		0	4,079,357	-812,047	87%			8894	0	2,490,327	2.10	5217892	5,217,892	-1,950,583	112%
		70A	JB2	115	6674.73	6673.90	0.0072	18	1.50	0.013	8.948	5,782,846		4,047,992			6635	0	1,857,763	2.20	4079357		0	4,079,357	-31,364	71%			8894	0	2,490,327	2.10	5217892	5,217,892	-1,169,900	90%
	SEE SOUTH BRANCH (2 LINES BECOME 1)																																			
	7 MHs LATER, LINES DIVERGE																																			
		64	62A	415	6664.15	6661.70	0.0059	18	1.50	0.013	8.093	5,230,106		3,661,074		6732	6732	1,884,845	1,884,845	2.19	4129251		0	4,129,251	-468,177	79%	2291	9022	9022	2526262	2,526,262	2.09	5281067	5,281,067	-1,619,992	101%
		62A	60A	420	6661.60	6659.90	0.0040	18	1.50	0.013	6.701	4,330,632		3,031,443			6732	0	1,884,845	2.19	4129251		0	4,129,251	-1,097,808	95%			9022	0	2,526,262	2.09	5281067	5,281,067	-2,249,624	122%
	M-1toM-3	60A	DB-2	193	6659.90	6658.81	0.0056	21	1.75	0.013	11.940	7,716,331		5,401,432		224	6955	62,650	1,947,495	2.18	4244239		0	4,244,239	1,157,193	55%	55	279	9301	78134	2,604,396	2.08	5417934	5,417,934	-16,502	70%
	SEE SOUTH BRANCH (2 LINES BECOME 1)																																			
	2 MHs LATER, LINES DIVERGE																																			
		DB-1	56A	361	6657.52	6657.50	0.0020	21	1.75	0.013	7.105	4,591,888		3,214,321		4987	4987	1,396,225	1,396,225	2.30	3209241		0	3,209,241	5,081	70%	1688	6674	6674	1868738	1,868,738	2.19	4099590	4,099,590	-885,268	89%
		56A	55A	384	6657.50	6655.89	0.0018	21	1.75	0.013	6.741	4,356,247		3,049,373			4987	0	1,396,225	2.30	3209241		0	3,209,241	-159,868	74%			6674	0	1,868,738	2.19	4099590	4,099,590	-1,050,216	94%
		55A	54A.1	143	6655.89	6656.08	0.0018	21	1.75	0.013	6.741	4,356,247		3,049,373			4987	0	1,396,225	2.30	3209241		0	3,209,241	-159,868	74%			6674	0	1,868,738	2.19	4099590	4,099,590	-1,050,216	94%
		54A.1	54A	401	6656.26	6655.12	0.0018	21	1.75	0.013	6.741	4,356,247		3,049,373			4987	0	1,396,225	2.30	3209241		0	3,209,241	-159,868	74%			6674	0	1,868,738	2.19	4099590	4,099,590	-1,050,216	94%
		54A	53A	402	6655.12	6654.42	0.0017	21	1.75	0.013	6.630	4,284,620		2,999,234			4987	0	1,396,225	2.30	3209241		0	3,209,241	-210,007	75%			6674	0	1,868,738	2.19	4099590	4,099,590	-1,100,356	96%
		53A	52A	419	6654.42		0.0014	21	1.75	0.013	5.945	3,841,849		2,689,294			4987	0	1,396,225	2.30	3209241		0	3,209,241	-519,947	84%			6674	0	1,868,738	2.19	4099590	4,099,590	-1,410,295	107%
		52A	50B	9			0.0258	21	1.75	0.013	25.519	16,492,486		11,544,740			4987	0	1,396,225	2.30	3209241		0	3,209,241	8,335,499	19%			6674	0	1,868,738	2.19	4099590	4,099,590	7,445,151	25%
	SEE SOUTH BRANCH (NORTH LINE TERMINATES UNTIL WEST YAMPA CROSSING)																																			
	SLEEPY BEAR CAMPGROUND / WEST YAMPA CROSSING																																			
	700+D+E+ F	32A	31 OLD	437	6608.70		0.0017	24	2.00	0.013	9.353	6,044,299		4,231,009		379	379	106,036	106,036	3.47	368146		0	368,146	3,862,863	6%	3933	4312	4312	1207276	1,207,276	2.35	2840255	2,840,255	1,390,754	47%
		31 OLD	30 OLD	497			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		30 OLD	29 OLD	501			0.0017	24	2.00	0.013	9.353	6,044,299		4,231,009			379	0	106,036	3.47	368146		0	368,146	3,862,863	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,390,754	47%
		29 OLD	28 OLD	410			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		28 OLD	27 OLD	387			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		27 OLD	26 OLD	282			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		26 OLD	25 OLD	439			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		25 OLD	24 OLD	497			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		24 OLD	23 OLD	455			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		23 OLD	22 OLD	438			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		22 OLD	21 OLD	437			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		21 OLD	20 OLD	116			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		20 OLD	19 OLD	439			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		19 OLD	18 OLD	456			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		18 OLD	17 OLD	425			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		17 OLD	16 OLD	497			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		16 OLD	15 OLD	500			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		15 OLD	14 OLD	500			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		14 OLD	13 OLD	480			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		13 OLD	12 OLD	490			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		12 OLD	11 OLD	460			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		11 OLD	10 OLD	217			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		10 OLD	9 OLD	230			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		9 OLD	8 OLD	300			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		8 OLD	7 OLD	260			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		7 OLD	6 OLD	200			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		6 OLD	5 OLD	222			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		5 OLD	4 OLD	157			0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
		4 OLD	DB-1				0.0015	24	2.00	0.013	8.785	5,677,630		3,974,341			379	0	106,036	3.47	368146		0	368,146	3,606,195	6%			4312	0	1,207,276	2.35	2840255	2,840,255	1,134,086	50%
MAIN TRUNK SOUTH																																				
	V-1 to V-4	96.16	96.15	310.00	6804.23	6789.50	0.0475	12	1.00	0.013	7.787	5,032,634		2,516,317		352	352	98,560	98,560	3.51	346217	8,625	8,625	354,842	2,161,475	7%	71	423	423	118300	118,300	3.41	403596	412,221	2,104,096	8%
Mt. Wern	X-1 + X-2	96.15	96.14	321.00	6786.00	6774.00	0.0374	12	1.00	0.013	6.907	4,463,884		2,231,942		241	593	67,340	165,900	3.23	536180	8,625	17,250	553,430	1,678,512	12%	78	318	741	89040	207,340	3.12	646627	663,877	1,568,065	15%
		96.14	96.13	350.00	6774.00	6757.00	0.0486	12	1.00	0.013	7.873	5,088,213		2,544,106			593	0	165,900	3.23	536180	8,625	25,875	562,055	1,982,051	11%			741	0	207,340	3.12	646627	672,502	1,871,605	13%
		96.13	96.12	243.00	6756.00	6747.50	0.0350	12	1.00	0.013	6.681	4,317,985		2,158,993			593	0	165,900	3.23	536180	8,625	34,500	570,680	1,588,312	13%			741	0	207,340	3.12	646627	681,127	1,477,866	16%
		96.12	96.11	222.00	6747.50	6740.00	0.0338	12	1.00	0.013	6.566	4,243,546		2,121,773			593	0	165,900	3.23	536180	8,625	43,125	579,305	1,542,468	14%			741	0	207,340	3.12	646627	689,752	1,432,022	16%
		96.11	96.10	172.00	6740.00	6738.00	0.0116	12	1.00	0.013	3.852	2,489,577		1,244,789			593	0	165,900	3.23	536180	8,625	51,750	587,930	656,858	24%			741	0	207,340	3.12	646627	698,377	546,412	28%
		96.10	96.9	120.00	6738.00	6735.00	0.0250	12	1.00	0.013	5.648	3,650,437		1,825,218			593	0	165,900	3.23	536180	8,625	60,375	596,555	1,228,663	16%			741	0	207,340	3.12	646627	707,002	1,118,217	19%
		96.9	96.8	136.00	6735.00	6732.00	0.0221	12	1.00	0.013	5.306	3,428,988		1,714,494			593	0	165,900	3.23	536180	8,625	69,000	605,180	1,109,314	18%			741	0	207,340	3.12	646627	715,627	998,867	21%
	T-1 to T-3	96.8	96.7	266.00	6731.75		0.0050	12	1.00	0.013	2.526	1,632,525		816,262		321	914	89,936	255,836	3.02	771485		69,000	840,485	-24,223	51%	9	330	1071	92456	299,796	2.94	881401	950,401	-134,138	58%
	W	96.7	96.6	30.00			0.0050	12	1.00	0.013	2.526	1,632,525		816,262		154	1068	43,092	298,928	2.94	879257		69,000	948,257	-131,994	58%	113	267	1338	74844	374,640	2.84	1062859	1,131,859	-315,597	69%
		96.6	96.5	425.00			0.0050	12	1.00	0.013	2.526	1,632,525		816,262			1068	0	298,928	2.94	879257		69,000	948,257	-131,994	58%			1338	0	374,640	2.84	1062859	1,131,859	-315,597	69%
	U	96.5	96.4	34.00			0.0050	12	1.00	0.013	2.526	1,632,525		816,262		143	1210	39,956	338,884	2.88	976973		69,000	1,045,973	-229,711	64%	35	178	1516	49756	424,396	2.78	1180233	1,249,233	-432,970	77%
		96.4	96.3	272.00			0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			1210	0	338,884	2.88	976973		69,000	1,045,973	1,026,002	35%			1516	0	424,396	2.78	1180233	1,249,233	822,742	42%
		96.3	96.2	236.00			0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			1210	0	338,884	2.88	976973		69,000	1,045,973	1,026,002	35%			1516	0	424,396	2.78	1180233	1,249,233	822,742	42%
		96.2	96.1	179.00			0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			1210	0	338,884	2.88	976973		69,000	1,045,973	1,026,002	35%			1516	0	424,396	2.78	1180233	1,249,233	822,742	42%
		96.1	96	182.00			0.0050	18	1.50	0.013	7.448	4,813,229		3,369,260			1210	0	338,884	2.88	976973		69,000	1,045,973	2,323,287	22%			1516	0	424,396	2.78	1180233	1,249,233	2,120,027	26%
Mt. Wern	Y-1 + Y-2	96	95	242.00			0.0036	21	1.75	0.013	9.533	6,160,664		4,312,465		6962	8172	1,949,332	2,288,216	2.12	4859788	1,002,000	1,071,000	5,930,788	-1,618,323	96%	3247	10209	11725	2858520	3,282,916	2.00	6581093	7,652,093	-3,339,628	124%
		95	94	160.00			0.0022	21	1.75	0.013	7.452	4,816,013		3,371,209			8172	0	2,288,216	2.12	4859788		1,071,000	5,930,788	-2,559,579	123%			11725	0	3,282,916	2.00	6581093	7,652,093	-4,280,884	159%
		94	93	400.00			0.0044	21	1.75	0.013	10.539	6,810,870		4,767,609			8172	0	2,288,216	2.12	4859788		1,071,000	5,930,788	-1,163,178	87%			11725	0	3,282,916	2.00	6581093	7,652,093	-2,884,483	112%
		93	92	314.00			0.0024	21	1.75	0.013	7.783	5,030,161		3,521,113			8172	0	2,288,216	2.12	4859788		1,071,000	5,930,788	-2,409,675	118%			11725	0	3,282,916	2.00	6581093	7,652,093	-4,130,980	152%
		92	91	500.00			0.0031	21	1.75	0.013	8.846	5,716,854		4,001,798			8172	0	2,288,216	2.12	4859788		1,071,000	5,930,788	-1,928,990	104%			11725	0	3,282,916	2.00	6581093	7,652,093	-3,650,295	134%
		91	90	500.00			0.0028	21	1.75	0.013	8.407	5,433,195		3,803,236			8172	0	2,288,216	2.12	4859788		1,071,000	5,930,788	-2,127,551	109%			11725	0	3,282,916	2.00	6581093	7,652,093	-3,848,856	141%
		90	89	125.00			0.0044	21	1.75	0.013	10.539	6,810,870		4,767,609			8172	0	2,288,216	2.12	4859788		1,071,000	5,930,788	-1,163,178	87%			11725	0	3,282,916	2.00	6581093	7,652,093	-2,884,483	112%
		89	88	300.00			0.0049	21	1.75	0.013	11.121	7,187,441		5,031,209			8172	0	2,288,216	2.12	4859788		1,071,000	5,930,788	-899,579	83%			11725	0	3,282,916	2.00	6581093	7,652,093	-2,620,884	106%
		88	87	236.00			0.0062	21	1.75	0.013	12.510	8,084,853		5,659,397			8172	0	2,288,216	2.12	4859788		1,071,000	5,930,788	-271,391	73%			11725	0	3,282,916	2.00	6581093	7,652,093	-1,992,696	95%
	R	87	86	465.00			0.0086	21	1.75	0.013	14.734	9,521,941		6,665,359		67	8239	18,732	2,306,948	2.12	4893184		1,071,000	5,964,184	701,175	63%	3	70	11795	19572	3,302,488	2.00	6614034	7,685,034	-1,019,676	81%
		86	85	329.00			0.0031	21	1.75	0.013	8.846	5,716,854		4,001,798			8239	0	2,306,948	2.12	4893184		1,071,000	5,964,184	-1,962,386	104%			11795	0	3,302,488	2.00	6614034	7,685,034	-3,683,236	134%
		85	84	498.00			0.0014	21	1.75	0.013	5.945	3,841,849		2,689,294			8239	0	2,306,948	2.12	4893184		1,071,000	5,964,184	-3,274,890	155%			11795	0	3,302,488	2.00	6614034	7,685,034	-4,995,740	200%
		84	83	349.00			0.0031	21	1.75	0.013	8.846	5,716,854		4,001,798			8239	0	2,306,948	2.12	4893184		1,071,000	5,964,184	-1,962,386	104%			11795	0	3,302,488	2.00	6614034	7,685,034	-3,683,236	134%
		83	82	400.00			0.0118	21	1.75	0.013	17.258	11,153,657		7,807,560			8239	0	2,306,948	2.12	4893184		1,071,000	5,964,184	1,843,376	53%			11795	0	3,302,488	2.00	6614034	7,685,034	122,525	69%
		82	81	75.00			0.0034	21	1.75	0.013	9.264	5,987,089		4,190,962			8239	0	2,306,948	2.12	4893184		1,071,000	5,964,184	-1,773,222	100%			11795	0	3,302,488	2.00	6614034	7,685,034	-3,494,072	128%
		81	80	266.00			0.0034	21	1.75	0.013	9.264	5,987,089		4,190,962			8239	0	2,306,948	2.12	4893184		1,071,000	5,964,184	-1,773,222	100%			11795	0	3,302,488	2.00	6614034	7,685,034	-3,494,072	128%
		80	79	395.00			0.0045	21	1.75	0.013	10.658	6,887,832		4,821,482			8239	0	2,306,948	2.12	4893184		1,071,000	5,964,184	-1,142,702	87%			11795	0	3,302,488	2.00	6614034	7,685,034	-2,863,552	112%
		79	78	375.00			0.0039	21	1.75	0.013	9.922	6,412,222		4,488,556			8239	0	2,306,948	2.12	4893184		1,071,000	5,964,184	-1,475,628	93%			11795	0	3,302,488	2.00	6614034	7,685,034	-3,196,479	120%
		78	77	99.00			0.0026	21	1.75	0.013	8.101	5,235,558		3,664,890			8239	0	2,306,948	2.12	4893184		1,071,000	5,964,184	-2,299,294	114%			11795	0	3,302,488	2.00	6614034	7,685,034	-4,020,144	147%
		77	76	192.00			0.0048	24	2.00	0.013	15.715	10,156,453		7,109,517			8239	0	2,306,948	2.12	4893184		1,071,000	5,964,184	1,145,333	59%			11795	0	3,302,488	2.00	6614034	7,685,034	-575,517	76%
P +	O-1 to O-5	76	75	385.00			0.0014	24	2.00	0.013	8.487	5,485,112		3,839,578		980	9219	274,428	2,581,376	2.08	5377679	629,000	1,700,000	7,077,679	-3,238,101	129%	56	1036	12831	290136	3,592,624	1.98	7098812	8,798,812	-4,959,234	160%
		75	74	500.00			0.0021	24	2.00	0.013	10.395	6,717,863		4,702,504			9219	0	2,581,376	2.08	5377679		1,700,000	7,077,679	-2,375,175	105%			12831	0	3,592,624	1.98	7098812	8,798,812	-4,096,308	131%
		74	JB3	70.00			0.0057	24	2.00	0.013	17.126	11,067,739		7,747,417			9219	0	2,581,376	2.08	5377679		1,700,000	7,077,679	669,738	64%			12831	0	3,592,624	1.98	7098812	8,798,812	-1,051,395	79%
(SERIES) OF JUNCTION AND SPLITTER BOXES	JUNCTION BOX (LINES CRISS-CROSS EACH OTHER)																	0																		
		JB3	73	14.00			0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975		4067	4067	1,138,629	1,138,629	2.37	2703964		0	2,703,964	-631,989	91%	1385	5451	5451	1526329	1,526,329	2.27	3458632	3,458,632	-1,386,657	117%
		73	72	299.00			0.0050	15	1.25	0.013	4.580	2,959,965		2,071,975			4067	0	1,138,629	2.37	2703964		0	2,703,964	-631,989	91%			5451	0	1,526,329	2.27	3458632	3,458,632	-1,386,657	117%
		72	71	353.00	2689.00		0.0054	15	1.25	0.013	4.760	3,076,085		2,153,260			4067	0	1,138,629	2.37	2703964		0	2,703,964	-550,704	88%			5451	0	1,526,329	2.27	3458632	3,458,632	-1,305,372	112%
		71	70	297.00			0.0047	15	1.25	0.013	4.441	2,869,792		2,008,854			4067	0	1,138,629	2.37	2703964		0	2,703,964	-695,109	94%			5451	0	1,526,329	2.27	3458632	3,458,632	-1,449,777	121%
		70	JB2	116.00		6674.20	0.0070	15	1.25	0.013	5.419	3,502,277		2,451,594			4067	0	1,138,629	2.37	2703964		0	2,703,964	-252,370	77%			5451	0	1,526,329	2.27	3458632	3,458,632	-1,007,038	99%
	2 LINES BECOME 1																	0																		
		JB2	69	86.00	6674.20	6673.22	0.0114	21	1.75	0.013	16.960	10,960,745		7,672,522		10701	10701	2,996,392	2,996,392	2.03	6095125	2,202,000	2,202,000	8,297,125	-624,604	76%	3644	14345	14345	4016656	4,016,656	1.94	7796256	9,998,256	-2,325,734	91%
		69	68	170.00	6673.20	6672.10	0.0065	21	1.75	0.013	12.780	8,259,393		5,781,575			10701	0	2,996,392	2.03	6095125		2,202,000	8,297,125	-2,515,550	100%			14345	0	4,016,656	1.94	7796256	9,998,256	-4,216,681	121%
		68	67	236.00	6672.00	6670.86	0.0048	21	1.75	0.013	11.042	7,136,293		4,995,405			10701	0	2,996,392	2.03	6095125		2,202,000	8,297,125	-3,301,720	116%			14345	0	4,016,656	1.94	7796256	9,998,256	-5,002,851	140%
		67	66	436.00	6669.86	6668.55	0.0030	21	1.75	0.013	8.709	5,628,189		3,939,732			10701	0	2,996,392	2.03	6095125		2,202,000	8,297,125	-4,357,393	147%			14345	0	4,016,656	1.94	7796256	9,998,256	-6,058,524	178%
		66	65	494.00	6668.50	6666.25	0.0046	21	1.75	0.013	10.722	6,929,534		4,850,674			10701	0	2,996,392	2.03	6095125		2,202,000	8,297,125	-3,446,451	120%			14345	0	4,016,656	1.94	7796256	9,998,256	-5,147,582	144%
		65	64	64.00	6666.15	6666.25	0.0040	21	1.75	0.013	10.048	6,493,910		4,545,737			10701	0	2,996,392	2.03	6095125		2,202,000	8,297,125	-3,751,388	128%			14345	0	4,016,656	1.94	7796256	9,998,256	-5,452,519	154%
		64	JB	124.00	6665.76	6665.10	0.0053	21	1.75	0.013	11.591	7,490,959		5,243,671			10701	0	2,996,392	2.03	6095125		2,202,000	8,297,125	-3,053,454	111%			14345	0	4,016,656	1.94	7796256	9,998,256	-4,754,585	133%
	LINES DIVERGE																	0																		
	L	JB	63	25.00	6665.10		0.0059	15	1.25	0.013	4.975	3,215,345		2,250,741		4126	4126	1,155,227	1,155,227	2.37	2737036		0	2,737,036	-486,295	85%	1404	5530	5530	1548354	1,548,354	2.26	3500506	3,500,506	-1,249,765	109%
		63	62	303.00			0.0060	15	1.25	0.013	5.017	3,242,479		2,269,735			4126	0	1,155,227	2.37	2737036		0	2,737,036	-467,301	84%			5530	0	1,548,354	2.26	3500506	3,500,506	-1,230,771	108%
		62	61	421.00		6659.41	0.0040	15	1.25	0.013	4.097	2,647,473		1,853,231			4126	0	1,155,227	2.37	2737036		0	2,737,036	-883,805	103%			5530	0	1,548,354	2.26	3500506	3,500,506	-1,647,275	132%
		61	DB-2	306.00	6658.64	6658.32	0.0010	27	2.25	0.013	10.042	6,489,967		4,542,977			4126	0	1,155,227	2.37	2737036		0	2,737,036	1,805,941	42%			5530	0	1,548,354	2.26	3500506	3,500,506	1,042,471	54%
	2 LINES BECOME 1																																			
		DB-2	58	350.00	6658.01		0.0019	30	2.50	0.013	17.927	11,585,772		8,110,040		11081	11081	3,102,722	3,102,722	2.02	6276302	2,202,000	2,202,000	8,478,302	-368,261	73%	3750	14831	14831	4152750	4,152,750	1.93	8017553	10,219,553	-2,109,513	88%
		58	DB-1	491.00		6656.43	0.0019	30	2.50	0.013	17.927	11,585,772		8,110,040			11081	0	3,102,722	2.02	6276302		2,202,000	8,478,302	-368,261	73%			14831	0	4,152,750	1.93	8017553	10,219,553	-2,109,513	88%
	LINES DIVERGE																																			
		DB-1	56	248.00	6656.43		0.0018	27	2.25	0.013	13.175	8,514,604		5,960,223		6095	6095	1,706,497	1,706,497	2.23	3798468	2,202,000	2,202,000	6,000,468	-40,245	70%	2063	8157	8157	2284013	2,284,013	2.12	4852287	7,054,287	-1,094,065	83%

REACH	SUB REACH	Manhole U/S	Manhole D/S	Length (ft.)	Invert Elevations OUT	Invert Elevations IN	Pipe Slope	Pipe Diam. (in.)	Pipe Diam (ft.)	Mannings n	Q(full) (cfs)	Q(full) (gpd)	*Q(Allow) (cfs)	*Q(Allowable) (gpd)
SERIES C	K	56	55	131.00			0.0018	27	2.25	0.013	13.175	8,514,604		5,960,223
		55	54	363.00			0.0018	27	2.25	0.013	13.175	8,514,604		5,960,223
		54	53	395.00			0.0018	27	2.25	0.013	13.175	8,514,604		5,960,223
		53	52	403.00			0.0016	27	2.25	0.013	12.421	8,027,645		5,619,352
		52	51	315.00			0.0014	27	2.25	0.013	11.619	7,509,175		5,256,422
		51	50B	113.00			0.0014	27	2.25	0.013	11.619	7,509,175		5,256,422
	N. LINE	50B	50A	60.00			0.0296	27	2.25	0.013	53.427	34,528,209		24,169,746
		50A	50	260.00			0.0050	24	2.00	0.013	16.040	10,365,887		7,256,121
		50	49	261.00			0.0050	24	2.00	0.013	16.040	10,365,887		7,256,121
		49.00	DB-C	144.00			0.0021	24	2.00	0.013	10.395	6,717,863		4,702,504
		DB-C	48	87.00			0.0280	24	2.00	0.013	37.956	24,530,166		17,171,116
	J-1 to J-3	48	47	501		6636.72	0.0105	24	2.00	0.013	23.243	15,021,597		10,515,118
	I	47	46	500	6636.63	6633.42	0.0064	30	2.50	0.013	32.902	21,263,667		14,884,567
		46	45A	250	6633.42	6631.71	0.0068	30	2.50	0.013	34.014	21,982,456		15,387,719
		45A	45	48	6631.71	6631.47	0.0050	30	2.50	0.013	29.082	18,794,604		13,156,222
		45	44	86	6631.47	6630.93	0.0063	30	2.50	0.013	32.590	21,061,816		14,743,271
	H	44	43	205	6630.93	6629.70	0.0060	30	2.50	0.013	31.857	20,588,457		14,411,920
		43	42	163	6629.70	6629.18	0.0032	30	2.50	0.013	23.230	15,012,604		10,508,823
	G	42	41	352	6629.18	6628.32	0.0024	30	2.50	0.013	20.329	13,137,903		9,196,532
		41	DB-4	456	6628.32	6626.16	0.0047	30	2.50	0.013	28.306	18,293,324		12,805,327
		DB-4	39	205	6626.16	6625.15	0.0049	30	2.50	0.013	28.868	18,656,575		13,059,603
		39	38	503	6625.15	6623.33	0.0036	30	2.50	0.013	24.739	15,988,211		11,191,748
		38	37	497	6623.33	6621.41	0.0039	30	2.50	0.013	25.563	16,520,401		11,564,281
		37	36	501	6621.41	6619.48	0.0039	30	2.50	0.013	25.527	16,497,113		11,547,979
		36	35	497	6619.48	6617.54	0.0039	30	2.50	0.013	25.695	16,606,222		11,624,355
		35	34	503	6617.54	6615.62	0.0038	30	2.50	0.013	25.410	16,421,574		11,495,102
		34	33	500	6615.62	6613.67	0.0039	30	2.50	0.013	25.684	16,598,944		11,619,261
		33	32	502	6613.67	6611.74	0.0038	30	2.50	0.013	25.501	16,480,674		11,536,472
		32	31	497	6611.74	6609.82	0.0039	30	2.50	0.013	25.563	16,520,401		11,564,281
TRUNKS COMBINE (SHOWN AS EQUIVALENT PIPE FOR EVALUATION)														
		31	30	445	6609.82	6608.02	0.0040	39	3.25	0.013	52.655	34,029,326		23,820,529
		30	29	496	6608.02	6606.07	0.0039	39	3.25	0.013	51.911	33,548,536		23,483,975
		29	28	457	6606.07	6604.25	0.0040	39	3.25	0.013	52.247	33,765,618		23,635,932
		28	27	440	6604.25	6602.54	0.0039	39	3.25	0.013	51.612	33,355,605		23,348,924
		27	26	419	6602.54	6600.70	0.0044	39	3.25	0.013	54.864	35,456,757		24,819,730
		26	25	102	6600.70	6600.36	0.0033	39	3.25	0.013	47.799	30,891,321		21,623,925
		25	24	452	6600.36	6599.64	0.0016	39	3.25	0.013	33.043	21,354,733		14,948,313
		24	23	474	6599.64	6599.00	0.0014	39	3.25	0.013	30.422	19,660,652		13,762,457
		23	22	427	6599.00	6598.52	0.0011	39	3.25	0.013	27.758	17,939,230		12,557,461
		22	21	494	6598.52	6597.80	0.0015	39	3.25	0.013	31.607	20,426,779		14,298,745
		21	20	500	6597.80	6597.16	0.0013	39	3.25	0.013	29.620	19,142,651		13,399,856
		20	19	500	6597.16	6596.38	0.0016	39	3.25	0.013	32.700	21,132,915		14,793,040
		19	18	465	6596.38	6595.75	0.0014	39	3.25	0.013	30.474	19,694,316		13,786,021
		18	17	494	6595.75	6595.02	0.0015	39	3.25	0.013	31.826	20,568,142		14,397,699
		17	16	451	6595.02	6594.24	0.0017	39	3.25	0.013	34.430	22,251,338		15,575,937
		16	15	221	6594.24	6593.97	0.0012	39	3.25	0.013	28.938	18,701,776		13,091,243
		15	14	225	6593.97	6593.55	0.0019	39	3.25	0.013	35.770	23,116,948		16,181,863
		14	13	309	6593.55	6593.13	0.0014	39	3.25	0.013	30.523	19,726,158		13,808,311
		13	12	241	6593.13	6592.73	0.0017	39	3.25	0.013	33.729	21,798,097		15,258,668
		12	11	240	6592.73	6592.33	0.0017	39	3.25	0.013	33.799	21,843,462		15,290,424
		11	10	220	6592.33	6591.94	0.0018	39	3.25	0.013	34.858	22,527,763		15,769,434
		10	9	158	6591.94	6591.73	0.0013	39	3.25	0.013	30.183	19,506,449		13,654,514
		9	DB-1	220	6591.73	6591.51	0.0010	39	3.25	0.013	26.181	16,919,873		11,843,911
Flow to Steamboat II Lift Station														
	A+B	364	309	364			0.0036	10	0.83	0.013	1.318	851,875		425,938
		309	276	309			0.0033	10	0.83	0.013	1.262	815,609		407,804
		276	Lift Station	276			0.0041	10	0.83	0.013	1.407	909,111		454,555

Manhole U/S	Manhole D/S	Area (acres)	Existing (EQR)	Existing (Cum. EQR)	Existing Q-Ave (gpd)	Existing Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	I & I (gpd)	I & I Cumm.	Existing **IPF (gpd)	Existing Excess Capacity	Percent Capacity	Proposed (EQR)	Ultimate (EQR)	Ultimate (Cum. EQR)	Ultimate Q-Ave (gpd)	Ultimate Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	Ultimate IPF (gpd)	Ultimate Excess Capacity	Percent Capacity
56	55		14	6109	3,892	1,710,389	2.23	3805744		2,202,000	6,007,744	-47,521	71%	39	53	8210	14812	2,298,825	2.12	4878706	7,080,706	-1,120,484	83%
55	54			6109	0	1,710,389	2.23	3805744		2,202,000	6,007,744	-47,521	71%			8210	0	2,298,825	2.12	4878706	7,080,706	-1,120,484	83%
54	53			6109	0	1,710,389	2.23	3805744		2,202,000	6,007,744	-47,521	71%			8210	0	2,298,825	2.12	4878706	7,080,706	-1,120,484	83%
53	52			6109	0	1,710,389	2.23	3805744		2,202,000	6,007,744	-388,392	75%			8210	0	2,298,825	2.12	4878706	7,080,706	-1,461,355	88%
52	51			6109	0	1,710,389	2.23	3805744		2,202,000	6,007,744	-751,321	80%			8210	0	2,298,825	2.12	4878706	7,080,706	-1,824,284	94%
51	50B			6109	0	1,710,389	2.23	3805744		2,202,000	6,007,744	-751,321	80%			8210	0	2,298,825	2.12	4878706	7,080,706	-1,824,284	94%
50B	50A		4987	11095	1,396,225	3,106,614	2.02	6282914		2,202,000	8,484,914	15,684,832	25%	1688	6674	14884	1868738	4,167,562	1.93	8041568	10,243,568	13,926,178	30%
50A	50			11095	0	3,106,614	2.02	6282914		2,202,000	8,484,914	-1,228,793	82%			14884	0	4,167,562	1.93	8041568	10,243,568	-2,987,447	99%
50	49			11095	0	3,106,614	2.02	6282914		2,202,000	8,484,914	-1,228,793	82%			14884	0	4,167,562	1.93	8041568	10,243,568	-2,987,447	99%
49.00	DB-C			11095	0	3,106,614	2.02	6282914		2,202,000	8,484,914	-3,782,410	126%			14884	0	4,167,562	1.93	8041568	10,243,568	-5,541,064	152%
DB-C	48			11095	0	3,106,614	2.02	6282914		2,202,000	8,484,914	8,686,202	35%			14884	0	4,167,562	1.93	8041568	10,243,568	6,927,548	42%
48	47	240.0	672	11767	188,244	3,294,858	2.00	6601196	115,000	2,317,000	8,918,196	1,596,922	59%	374	1046	15931	292992	4,460,554	1.91	8513858	10,830,858	-315,740	72%
47	46		13	11780	3,556	3,298,414	2.00	6607180		2,317,000	8,924,180	5,960,387	42%	3	15	15946	4284	4,464,838	1.91	8520726	10,837,726	4,046,841	51%
46	45A			11780	0	3,298,414	2.00	6607180		2,317,000	8,924,180	6,463,539	41%			15946	0	4,464,838	1.91	8520726	10,837,726	4,549,993	49%
45A	45			11780	0	3,298,414	2.00	6607180		2,317,000	8,924,180	4,232,042	47%			15946	0	4,464,838	1.91	8520726	10,837,726	2,318,497	58%
45	44			11780	0	3,298,414	2.00	6607180		2,317,000	8,924,180	5,819,091	42%			15946	0	4,464,838	1.91	8520726	10,837,726	3,905,546	51%
44	43		74	11854	20,748	3,319,162	2.00	6642074		2,317,000	8,959,074	5,452,846	44%		74	16020	20748	4,485,586	1.91	8553974	10,870,974	3,540,946	53%
43	42			11854	0	3,319,162	2.00	6642074		2,317,000	8,959,074	1,549,749	60%			16020	0	4,485,586	1.91	8553974	10,870,974	-362,151	72%
42	41		72	11926	20,020	3,339,182	2.00	6675710	85,000	2,402,000	9,077,710	118,822	69%	63	134	16154	37632	4,523,218	1.90	8614215	11,016,215	-1,819,683	84%
41	DB-4			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	3,727,616	50%			16154	0	4,523,218	1.90	8614215	11,016,215	1,789,111	60%
DB-4	39			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	3,981,892	49%			16154	0	4,523,218	1.90	8614215	11,016,215	2,043,387	59%
39	38			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	2,114,037	57%			16154	0	4,523,218	1.90	8614215	11,016,215	175,532	69%
38	37			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	2,486,571	55%			16154	0	4,523,218	1.90	8614215	11,016,215	548,066	67%
37	36			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	2,470,269	55%			16154	0	4,523,218	1.90	8614215	11,016,215	531,764	67%
36	35			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	2,546,645	55%			16154	0	4,523,218	1.90	8614215	11,016,215	608,140	66%
35	34			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	2,417,392	55%			16154	0	4,523,218	1.90	8614215	11,016,215	478,887	67%
34	33			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	2,541,551	55%			16154	0	4,523,218	1.90	8614215	11,016,215	603,046	66%
33	32			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	2,458,761	55%			16154	0	4,523,218	1.90	8614215	11,016,215	520,256	67%
32	31			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	2,486,571	55%			16154	0	4,523,218	1.90	8614215	11,016,215	548,066	67%
31	30			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	14,742,818	27%			20126	0	5,635,280	1.84	10361171	12,763,171	11,057,358	38%
30	29			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	14,406,265	27%			20126	0	5,635,280	1.84	10361171	12,763,171	10,720,805	38%
29	28			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	14,558,222	27%			20126	0	5,635,280	1.84	10361171	12,763,171	10,872,762	38%
28	27			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	14,271,213	27%			20126	0	5,635,280	1.84	10361171	12,763,171	10,585,753	38%
27	26			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	15,742,019	26%			20126	0	5,635,280	1.84	10361171	12,763,171	12,056,559	36%
26	25			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	12,546,214	29%			20126	0	5,635,280	1.84	10361171	12,763,171	8,860,754	41%
25	24			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	5,870,603	43%			20126	0	5,635,280	1.84	10361171	12,763,171	2,185,142	60%
24	23			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	4,684,746	46%			20126	0	5,635,280	1.84	10361171	12,763,171	999,286	65%
23	22			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	3,479,750	51%			20126	0	5,635,280	1.84	10361171	12,763,171	-205,710	71%
22	21			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	5,221,035	44%			20126	0	5,635,280	1.84	10361171	12,763,171	1,535,574	62%
21	20			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	4,322,146	47%			20126	0	5,635,280	1.84	10361171	12,763,171	636,685	67%
20	19			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	5,715,330	43%			20126	0	5,635,280	1.84	10361171	12,763,171	2,029,870	60%
19	18			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	4,708,311	46%			20126	0	5,635,280	1.84	10361171	12,763,171	1,022,851	65%
18	17			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	5,319,989	44%			20126	0	5,635,280	1.84	10361171	12,763,171	1,634,529	62%
17	16			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	6,498,227	41%			20126	0	5,635,280	1.84	10361171	12,763,171	2,812,766	57%
16	15			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	4,013,533	49%			20126	0	5,635,280	1.84	10361171	12,763,171	328,073	68%
15	14			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	7,104,153	39%			20126	0	5,635,280	1.84	10361171	12,763,171	3,418,693	55%
14	13			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	4,730,600	46%			20126	0	5,635,280	1.84	10361171	12,763,171	1,045,140	65%
13	12			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	6,180,958	42%			20126	0	5,635,280	1.84	10361171	12,763,171	2,495,497	59%
12	11	50.9		11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	6,212,713	42%			20126	0	5,635,280	1.84	10361171	12,763,171	2,527,253	58%
11	10			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	6,691,724	40%			20126	0	5,635,280	1.84	10361171	12,763,171	3,006,264	57%
10	9			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	4,576,804	47%			20126	0	5,635,280	1.84	10361171	12,763,171	891,344	65%
9	DB-1			11926	0	3,339,182	2.00	6675710		2,402,000	9,077,710	2,766,201	54%			20126	0	5,635,280	1.84	10361171	12,763,171	-919,259	75%
364	309		406	406	113,540	113,540	4.00	454160	400,000	400,000	854,160	-428,222	100%	706	1112	1112	311304	311,304	3.00	933912	1,333,912	-907,974	157%
309	276			406	0	113,540	4.00	454160		400,000	854,160	-446,356	105%			1112	0	311,304	3.00	933912	1,333,912	-926,108	164%
276	Lift Station			406	0	113,540	4.00	454160		400,000	854,160	-399,605	94%			1112	0	311,304	3.00	933912	1,333,912	-879,357	147%

	Existing (EQR)	Existing (Cum. EQR)	Existing Q-Ave (gpd)	Existing Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	I & I Cumm.	Existing **IPF (gpd)
Total Existing Flow to Interceptor	12304	12304	3,445,218	3,445,218	1.99	6853333	2,402,000	9,255,333
Total Existing flow to Plant						7307493	2,802,000	10,109,493

	Ultimate (EQR)	Ultimate (Cum. EQR)	Ultimate Q-Ave (gpd)	Ultimate Q-Cumm. (gpd)	PEAK FACTOR	Domestic Peak Flow (gpd)	Ultimate IPF (gpd)
Total Ultimate flow to Interceptor	20466	20466	5730494	5,730,494	1.83	10508026	12,910,026
Total Ultimate flow to Plant						11441938	14,243,938

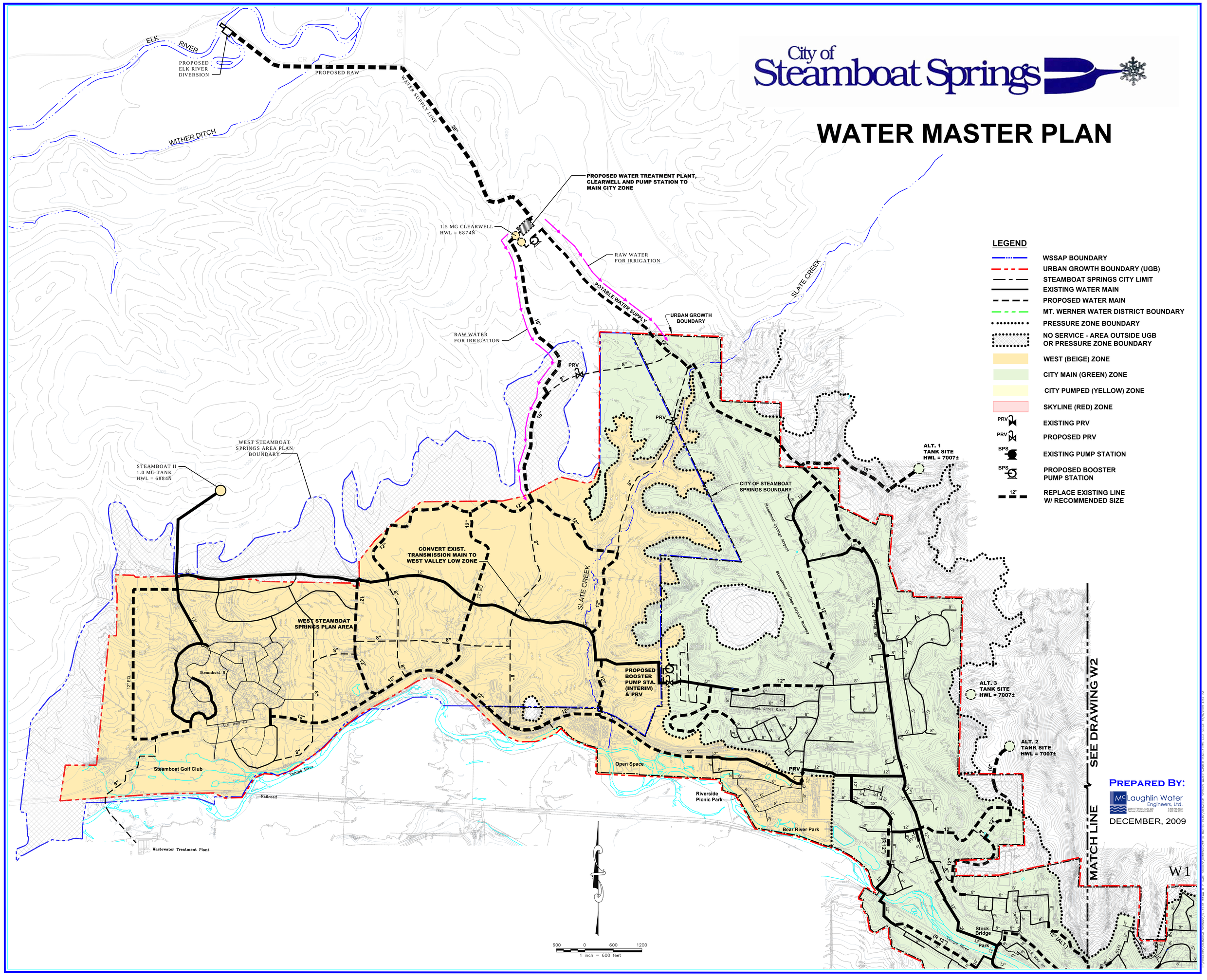
NOTES:
1. *Q(Allowable) reflects pipe capacities at 50% of pipe Q for 8" to 12" and 70% of pipe Q for sizes larger than 12"
2. **IPF refers to Instantaneous Peak Flow

= Assumed slope or assumed diameter

= Assumed slope based on parallel line

= Pipe capacity approached - to be monitored

= Pipe capacity exceeded - replacement required


City of Steamboat Springs
WATER MASTER PLAN
LEGEND
WSSAP BOUNDARY
URBAN GROWTH BOUNDARY (UGB)
STEAMBOAT SPRINGS CITY LIMIT
EXISTING WATER MAIN
PROPOSED WATER MAIN
MT. WERNER WATER DISTRICT BOUNDARY
PRESSURE ZONE BOUNDARY
NO SERVICE - AREA OUTSIDE UGB OR PRESSURE ZONE BOUNDARY
WEST (BEIGE) ZONE
CITY MAIN (GREEN) ZONE
CITY PUMPED (YELLOW) ZONE
SKYLINE (RED) ZONE
EXISTING PRV
PROPOSED PRV
EXISTING PUMP STATION
PROPOSED BOOSTER PUMP STATION
REPLACE EXISTING LINE W/ RECOMMENDED SIZE
ELK RIVER
PROPOSED ELK RIVER DIVERSION
PROPOSED RAW
WATER SUPPLY LINE
WITHER DITCH
PROPOSED WATER TREATMENT PLANT, CLEARWELL AND PUMP STATION TO MAIN CITY ZONE
1.5 MG CLEARWELL HWL = 6874Ñ
RAW WATER FOR IRRIGATION
POTABLE WATER SUPPLY
URBAN GROWTH BOUNDARY
SLATE CREEK
ALT. 1 TANK SITE HWL = 7007±
CITY OF STEAMBOAT SPRINGS BOUNDARY
WEST STEAMBOAT SPRINGS AREA PLAN BOUNDARY
STEAMBOAT II 1.0 MG TANK HWL = 6884Ñ
CONVERT EXIST. TRANSMISSION MAIN TO WEST VALLEY LOW ZONE
WEST STEAMBOAT SPRINGS PLAN AREA
PROPOSED BOOSTER PUMP STA. (INTERIM) & PRV
ALT. 3 TANK SITE HWL = 7007±
ALT. 2 TANK SITE HWL = 7007±
Steamboat Golf Club
Open Space
Riverside Picnic Park
Bear River Park
Stock-Bridge Park
Wastewater Treatment Plant
Railroad
Yampa River
SEE DRAWING W2
MATCH LINE
W1
PREPARED BY:
McLaughlin Water Engineers, Ltd.
DECEMBER, 2009
600 0 600 1200
1 inch = 600 feet

24a-130

City of Steamboat Springs

WATER MASTER PLAN

LEGEND

- WSSAP BOUNDARY
- URBAN GROWTH BOUNDARY (UGB)
- STEAMBOAT SPRINGS CITY LIMIT
- EXISTING WATER MAIN
- PROPOSED WATER MAIN
- MT. WERNER WATER DISTRICT BOUNDARY
- PRESSURE ZONE BOUNDARY
- NO SERVICE - AREA OUTSIDE UGB OR PRESSURE ZONE BOUNDARY
- WEST (BEIGE) ZONE
- CITY MAIN (GREEN) ZONE
- CITY PUMPED (YELLOW) ZONE
- SKYLINE (RED) ZONE
- PRV — EXISTING PRV
- PRV — PROPOSED PRV
- BPS — EXISTING PUMP STATION
- BPS — PROPOSED BOOSTER PUMP STATION
- 12" — REPLACE EXISTING LINE W/ RECOMMENDED SIZE

600 0 600 1200
1 inch = 600 feet

SEE DRAWING W1

MATCH LINE

CITY OF STEAMBOAT SPRINGS CITY LIMITS

CITY OF STEAMBOAT SPRINGS BOUNDARY

VALVE TO REMAIN CLOSED AT ALL TIMES

WILLETT HEIGHTS PUMP STATION & TANK 1.0 MG HWL = 7017

FISH CREEK FALLS ROAD TANK 0.25 MG HWL = 7274 (AKA CITY TANK)

SKYLINE TANK 0.25 MG HWL = 7470 (APPROX. LOCATION)

PRIVATE PUMP STATION (NOT MAINTAINED BY CITY)

CLOSED VALVE

INTER-CONNECTION METER

VAULT SEPARATING FISH CREEK & OLD TOWN PRESSURE ZONES; NO PHYSICAL CONNECTION

PROPOSED BOOSTER PUMP STATION

12" (MT. WERNER)

FISH CREEK WATER TREATMENT PLANT & TANK 2.0 MG HWL = 7787

HOWELSEN HILL PUMP HOUSE

Picnic Park
Bear River Park
Stock-Bridge Park
Lithia Springs
Steamboat Springs Park
Iron Springs Park
Howelsen Park
Open Space
Rodeo Grounds
Brooklyn Park
Snake Island
Emerald Park
Yampa River Botanic Park
Fetcher Park
Stehley Park
Strawberry Park
Spring Creek Park
Memorial Park
Rita Valentine Park
Sheraton Steamboat Golf Club

MT. WERNER WATER DISTRICT

MT. WERNER WATER DISTRICT CONTINUES SOUTH (NOT SHOWN)

INSET MATCH LINE (SEE LEFT)

INSET MATCH LINE (FROM RIGHT)

WTP AND FINISHED WATER PUMPING

FEED TO WTP FROM CITY GALLERY

FEED TO WTP FROM DISTRICT GALLERY

PREPARED BY:

McLaughlin Water Engineers, Ltd.
2500 15th Street, Suite 200
Denver, Colorado 80202
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DECEMBER, 2009

W2

City of Steamboat Springs

SEWER MASTER PLAN

LEGEND

- STEAMBOAT SPRINGS CITY LIMIT
- WSSAP BOUNDARY
- URBAN GROWTH BOUNDARY
- MT. WERNER WATER DISTRICT BOUNDARY
- EXISTING SEWER (WITH PIPE SIZE)
- PROPOSED SEWER (SIZES APPROXIMATE, TO BE VERIFIED DURING FINAL DESIGN PHASE)
- BASIN BOUNDARY
- SUB BASIN BOUNDARY
- PIPE CAPACITY EXCEEDED-REPLACEMENT REQUIRED
- PIPE CAPACITY APPROACHED - TO BE MONITORED
- INFILTRATION/INFLOW MONITORING MANHOLE

ELK RIVER
WITHER DITCH
CR. 44C
CR. 44
ELK RIVER RD. CR. 129
SLATE CREEK
PROPOSED ELK RIVER WATER TREATMENT PLANT
WATER TREATMENT BACKWASH WASTE/ SANITARY SEWER
WEST STEAMBOAT SPRINGS AREA PLAN BOUNDARY
WEST STEAMBOAT SPRINGS PLAN AREA
Steamboat II
A
B
C
D
E
F
G
H
J-1
J-2
J-3
K
L
M-1
Q_D= 0.93 MGD
1112 EQR
Q_D= 0.93 MGD
+I/I= ÑD.4 MGD
Q_D= 10.4 MGD
+I/I ÑŽ.4 MGD
Q_D= 1.08 MGD
1359 EQR
Q_D= 2.84 MGD
Q_P= 2.16 MGD
Q_D= 8,61 MGD
+I/I= ±2.4 MGD
Q_P= 13.1 MGD
Q_D= 0.86 MGD
+I/I= ±.120 MGD
Q_P= 2.78 MGD
Steamboat Golf Club
U.S. Hwy 40
Yampa River
Railroad
Steamboat II Lift Station
WASTEWATER TREATMENT PLANT
Open Space
ABANDONED 24"
Riverside Picnic Park
Bear River Park
STEAMBOAT SPRINGS CITY LIMIT
URBAN GROWTH BOUNDARY
Steamboat Springs Airport
Steamboat Springs Airport Runway
West Acres Drive
Elk River Rd.
Stock Bridge
Indian Trails
PRIVATE FORCE MAIN
MATCH LINE SEE DRAWING S2

600 0 600 1200
1 inch = 600 feet

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DECEMBER, 2009

S 1

City of Steamboat Springs

SEWER MASTER PLAN

LEGEND

- STEAMBOAT SPRINGS CITY LIMIT
- WSSAP BOUNDARY
- URBAN GROWTH BOUNDARY
- MT. WERNER WATER DISTRICT BOUNDARY
- EXISTING SEWER (WITH PIPE SIZE)
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- BASIN BOUNDARY
- SUB BASIN BOUNDARY
- PIPE CAPACITY EXCEEDED-REPLACEMENT REQUIRED
- PIPE CAPACITY APPROACHED - TO BE MONITORED
- INFILTRATION/INFLOW MONITORING MANHOLE

Q_D= 0.86 MGD
+I/I= ±.120 MGD
Q_C= 2.78 MGD

Q_D= 7.1 MGD
+I/I= ±1.7 MGD
Q_C= 5.48 MGD

Q_D= 0.88 MGD
Q_C= 1.63 MGD

Q_D= 6.58 MGD
+I/I= ±1.1 MGD
Q_C= 4.82 MGD

Q_D= 0.67 MGD
Q_C= 5.1 MGD

Q_D= 1.18 MGD
+I/I = 0.069 MGD
Q_C= 4.81 MGD

Q_D= 0.23 MGD
Q_C= 0.78 MGD

Q_D= 5.72 MGD
I/I= ±1.0 MGD
Q_C= 3.9 MGD

SEE DRAWING S1

MATCH LINE

MOUNT WERNER CONNECTION

MOUNT WERNER CONNECTION

MOUNT WERNER CONNECTION

CITY OF STEAMBOAT SPRINGS BOUNDARY

MT. WERNER WATER DISTRICT

600 0 600 1200
1 inch = 600 feet

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DECEMBER, 2009

S 2