Trunk Sewer Master Plan

City of Kingman, Arizona

May 2003

CITY OF KINGMAN

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* Located in pockets at back of report

SECTION 1.0
EXECUTIVE SUMMARY

1.1 Purpose of the Trunk Sewer Master Plan

The City of Kingman authorized **Burgess & Niple (B&N)** to evaluate selected trunk sewers in its Hilltop Wastewater Service area for the following reasons:

- To identify trunk sewers that may be at capacity under existing wastewater flows.
- To identify trunk sewers that may reach capacity when build-out flows are realized.
- To propose improvements to existing trunk sewers (sewer paralleling, etc.).
- To identify costs associated with the proposed improvements.

1.2 Planning Areas

Two Planning Areas were identified for this report. The boundaries of each Planning Area were developed around service areas of trunk sewers having the following characteristics.

- Trunk sewers that serve areas that are currently well developed and where existing flows may be approaching or exceeding sewer design capacity; and/or
- Trunk sewers that will receive flows from future development, and may then approach or exceed design capacity

Planning Area 1 encompasses the following trunk sewers and their service areas:

1. Airway West
2. Fairgrounds
3. Harrison Street
4. East Trunk
5. Kino

Most of the service areas served by the above trunk sewers are identified using the same numerical designation presented in a previous report prepared for the City.[1] These are shown on **Figure 4** and are numbered 7 through 29. Service areas 30, 31, 32 and 33 were added on the east side of the Planning Area since this area is anticipated to be served by the East Trunk Sewer. Service area 15 was split to reflect the

[1] Hilltop Wastewater Treatment Plant Expansion and Upgrade Evaluation Study, John Carollo Engineers, September, 1991

division of wastewater flow to two separate trunk lines. The boundaries of this Planning Area, the trunk sewers evaluated, and the service areas affected are presented in **Figure 1.**

Planning Area 2 includes the Airport Trunk Sewer and its service area. The limits of this planning area are shown in **Figure 8.**

1.3 Methodology

The methodology for evaluating the selected trunk sewers is key to determining whether or not these sewers have sufficient capacity for peak flows generated by existing and/or future wastewater flows. The methodology adopted was based upon the following key elements:

- Flow monitoring at key manholes in the selected trunk sewers,
- Current and projected population,
- Projected land use,
- System characteristics, and
- Current software tools.

The major concepts of the approach used are presented below. A more detailed description of the methodology is presented in Section 5.

1. The trunk sewers to be evaluated were identified.
2. The flow in each of the selected trunk sewers was monitored for a two-week period and hydrographs of the flow were developed.
3. The population in each of the services areas was estimated.
4. The actual average daily flow in each trunk sewer (less non-residential flows); and the service area populations were used to calculate per capita flows.
5. The physical characteristics of the trunk sewers, current service area population data, unit flows (per capita and non-residential), non-residential acreages, and a peaking formula developed from the flow monitoring data were keyed into SewerCad and the model was run.
6. The model computed the existing peak flows in the trunk sewers, compared this to the design capacity of the sewers, and indicated which, if any, of the sewer sections are currently under sized.
7. The anticipated future population, and commercial/industrial acreages, that will affect the key trunk sewers were then put into the model and the model run to determine peak flows in the sewers at build-out.
8. Again the model compared the peak flows to the design capacity of the sewers and indicated which, if any, of the sewers are undersized to carry future flows.
9. The improvements needed to avoid surcharging of the sewers were identified and the cost of these improvements was estimated.

1.4 Summary of Results/Recommended Improvements

The results of the modeling performed on the selected trunk sewers are presented in Appendices B through D. These present the projected flow per section and reach in each trunk sewer for existing flow conditions (Appendices B&C) and anticipated future flows (Appendices C&D). A reach is defined, for the purposes of this report, as a portion of sewer with the same pipe size and a section is a portion of pipe between two manholes.

The modeling reports indicate that most sections of the existing trunk sewers (in Planning Areas 1 & 2) have sufficient capacity for average and peak flows resulting from existing sewered development. However, some surcharging (wastewater backing up in a manhole) may occur in some sections of pipe at peak flow from existing development. These are identified in Appendices B and C.

The trunk sewer serving the Airport Planning Area will have some surcharging at anticipated future flows. The model indicates that some trunk sewer sections in Planning Area 1 will be overloaded at buildout. This includes sections of the East Trunk Sewer that could be overloaded by average flows as developments from the east side are connected to the sewer. Also, sections of the Airway West Trunk, Kino Trunk, Fairgrounds Trunk, Harrison Trunk, and additional portions of the East Trunk are anticipated to be overloaded by future peak flows. Most of the Kino Trunk, Fairgrounds Trunk and Harrison Trunk have sufficient capacity for future anticipated development.

Based upon the amount of excess flow projected in these sewers by the model, parallel sewers were identified and sized. It was assumed that the new sewers would be constructed at approximately the same depth and slope as the existing sewers being paralleled. Table 1-1 shows the recommended improvements and estimated cost.

TABLE 1-1

TRUNK SEWER IMPROVEMENTS

		Length of Proposed Parallel Sewer at Build-out (Linear Feet)						
No.	**Trunk Sewer**	**8 inch**	**10 inch**	**12 inch**	**15 inch**	**18 inch**	**Total**	**Cost**
1	Airway West	2,908	1,376				4,284	$188,508
2	Kino	200	400				600	$29,969
3	Harrison Street	3,811		359			4,170	$224,617
4	Fairgrounds	7,520					7,520	$317,570
5	East Trunk	8,371	4,520			3,220	16,111	$983,184
6	Airport	700		5,895		35	6,630	$289,397
	TOTAL	**23,510**	**6,296**	**6,244**	**0**	**3,255**	**39,305**	**$2,033,245**

SECTION 2.0
INTRODUCTION

2.1 Authorization

The City of Kingman authorized **B&N** to evaluate key trunk sewers in its Hilltop Wastewater Service area.

2.2 Objectives

The objectives of this evaluation were as follows:

- To identify trunk sewers that may be at capacity under existing wastewater flows.
- To identify trunk sewers that may reach capacity when build-out flows are realized.
- To propose improvements to existing trunk sewers.
- To identify costs associated with the proposed improvements.

2.3 Previous Wastewater Reports

2.3.1 Hilltop Wastewater Treatment Plant Expansion and Upgrade Evaluation Study

In September 1991, John Carollo Engineers prepared the "Hilltop Wastewater Treatment Plant Expansion and Upgrade Evaluation Study". While the focus of the report was on the treatment plant, the report also identified sewer service areas in the City (see Figure 4) and presented a cursory evaluation of the following trunk sewers:

- Gordon Drive
- Kino Avenue
- Airway Avenue, East
- Airway Avenue, West
- Harrison Street
- Detroit Avenue

The report concluded "in the near term, none of the trunk sewers which were reviewed demonstrate significant capacity problems." The longer-term findings for each sewer are described below:

- Gordon Drive: A new parallel 10-inch sewer will be required if future service is provided to sub-basins 18, 19 and 22; or just 18 and 19.

- Kino Avenue: This sewer has sufficient capacity to serve its drainage basin through build-out.

- Airway Avenue, East: With the implementation of the North Willow Interceptor Sewer, the trunk sewer between North Burbank Street and Harrison Street is adequate. The capacity east of Harrison Street may be adequate if this sewer does not serve sub-basins 18 and 19. Additional lines would be needed to serve sub-basins 18, 19, 22 and 24. (Since 1991 the East Trunk Sewer has been constructed to serve these sub-basins).

- Airway Avenue, West: The portion of this sewer along Sycamore Avenue to the interceptor sewer has sufficient capacity for build-out. The pipeline along Western Avenue may be undersized to serve sub-basin 15 to full development.

- Harrison Street: The capacity of portions of this sewer would be exceeded when serving full development of sub-basins 22 through 28. (The East Trunk Sewer and future parallel lines will receive much of the flow from these areas).

- Detroit Avenue: This trunk sewer has adequate capacity to handle projected flows for full development of its service area.

2.3.2 Kingman Eastside Trunk Sewer Line

In April 1993, **B&N** completed a Design Concept Report for the Eastside Trunk Sewer Line. The purpose of this sewer was to provide service to the following areas:

- The area between the Atchinson, Topeka & Santa Fe Railroad (A, T & SF) east to Sage Street and from Southern Avenue north to Airway Avenue

- The area between Airway Avenue and Kino Drive from Rainbow Drive to Willow Road

The report recommended that the East Trunk Sewer be constructed south of, and parallel to, the A, T & SF Railroad alignment; and along Arizona Avenue, Shangrila, Rainbow Drive and Kino Avenue. The report further recommended pipe sizes ranging from 12" to 15". The sewer was constructed in 1993 using PVC pipe. This project relieved many of the capacity problems projected in the Carollo report.

2.3.3 Planning Area 2

There are no known previous studies of the Airport sewer system.

SECTION 3.0

WASTEWATER PLANNING AREAS

3.1 General

Representatives of the City of Kingman identified existing trunk sewers within the City limits that have the following characteristics:

- Sewers that serve areas that are currently well developed and where existing flows may be approaching or exceeding the design capacity of the sewers.
- Sewers that will receive flows from short or long term future development, and may then approach or exceed design capacity.

Of the key trunk sewers identified by City Staff, five (5) are located in the Central Kingman area and the sixth is located at the Airport. All six (6) discharge to the Hilltop Wastewater Treatment Plant.

The six (6) trunk sewers are the following:

1. Airway West
2. Kino
3. Harrison Street
4. Fairgrounds
5. East Trunk
6. Airport

As indicated in Section 2.2, the goal of this evaluation was to determine whether or not these trunk sewers have sufficient capacity to receive measured existing flows, and anticipated future flows.

In order to accomplish this objective, the Planning Areas were defined by the service areas affected by the six (6) selected trunk sewers. Since the first five (5) trunk sewers serve a different area (Central Kingman), and have a different interceptor sewer than the Airport Trunk Sewer, two (2) Planning Areas were defined.

The boundary of Planning Area 1 was developed to encompass service areas of the five (5) trunk sewers serving the Central Kingman area. As discussed in Section 2.3, John Carollo Engineers identified the sub-areas served by each of the City's major trunk sewers in their 1991 evaluation. For consistency, the sub-area numbering used in that report is used here. This has been supplemented by expanding the East Trunk service area to include Sections 9, 10, 15, 16 and part of 17, as requested by the City. The

numbered service areas are shown in **Figure 4** and the boundary defining Planning Area 1 is presented in **Figure 1**.

Planning Area 2 includes the Airport Trunk Sewer and its service area. This Planning Area is shown in **Figure 8**.

Figures 1 through 7 describe different characteristics of Planning Area 1, the Central Planning Area. Figures 8 through 13 describe similar characteristics of Planning area 2, the Airport Planning Area.

SECTION 4.0

EXISTING CONDITIONS

4.1 Topography

The City of Kingman is located in an area between two mountain ranges. The Cerbat Range is located to the north; and the Hualapai Range is located to the south. The latter rises to an elevation of 8,600 feet. To the west of the City is the Sacramento Valley, which slopes to the Colorado River. East of the City, the terrain slopes gently down into the Hualapai Valley[2].

The topography of Planning Area 1 ranges from 3535 feet in the southeast corner to 3362 feet in the northwest. In Planning Area 2, the terrain slopes from 3325 feet in the Central portion of the planning area to 3266 feet in the northeast corner.

4.2 Sanitary Sewers

The City of Kingman has two separate treatment plants and two separate collection systems. This has developed as a result of a ridge that divides the City. The two sewer systems are known as the "Downtown" system, which serves the western part of Kingman, and the "Hilltop" system, which serves the east side of the City. All of the trunk sewers evaluated in this study are included in the Hilltop system and discharge to the Hilltop Wastewater Treatment Plant.

The wastewater collection and interceptor sewers discharging to the Hilltop plant range in size from 6-inch to 30-inch in diameter. The sewer system serving Planning Area 1, including collector sewers, trunk sewers, and interceptor sewers is shown in **Figure 1**. The collection and trunk sewer system of Planning Area 2 is shown in **Figure 8**. These sewers range in size from 8-inch to 18-inch in diameter.

[2] Hilltop Wastewater Treatment Plant Expansion and Upgrade Evaluation Study, John Carollo Engineers, September, 1991

4.3 Hilltop Wastewater Treatment Plant

All of the selected trunk sewers discharge to the Hilltop WWTP. The five trunk sewers located in the Central part of the City are served by two parallel interceptor sewers (21"/30" and 15"/18"), which discharge to the plant, approximately 5 miles northeast of the City limits. The airport trunk sewer discharges to its own 15" interceptor that runs to the plant.

The Hilltop WWTP consists of a mechanical screen with grinder, aerated lagoons, polishing pond, polishing pond effluent pump station, wetlands, and rapid infiltration basins. These facilities are designed to provide a minimum of 90 percent removal of suspended solids (SS), 90 percent removal of five-day biochemical oxygen demand (BOD_5) and an annual average nitrogen concentration of <10.0 mg/L. The design capacity of the plant is 2.0 mgd average daily flow. The headworks have a peak flow capacity of 12.0 mgd and the rest of the facilities have a peak flow capacity of 8.0 mgd.

4.4 Current and Projected Populations

The 2000 census indicated a population in Kingman of 20,069. However, this includes the downtown area as well as planning Areas 1 and 2.

The existing populations for the Planning Areas were estimated from a count of existing houses, apartments, etc., in each service area, and an estimate for the number of people per unit. The future populations were projected based upon a count of proposed lots and the City's land use plan. The results of these evaluations are shown in the following table.

Table 4-1
Estimated Current Population

Drainage Basin	No of Housing Units	People Per Household	No of Apartments	People Per Apartment	No of Mobile Units	People Per Unit	Service Population
1	222	2.39	40	2.0	0	2.0	609
2	670	2.35	0	2.0	35	2.0	1643
3	339	2.57	198	2.0	51	2.0	1370
4	1162	2.38	171	2.0	0	2.0	3105
5	790	2.40	156	2.0	0	2.0	2204
6	2	2.33	0	2.0	0	2.0	5

Table 4-2
Future Population Projection

Monitoring MH/ Service Area/ Trunk Sewer	Existing Population	Future Added Population	Total Population at Build-Out
1	609	12,192	12,801
2	1,643	5,728	7,371
3	1,370	430	1,800
4	3,105	3,191	6,296
5	2,204	54,751	56,955
6	5	0	5

SECTION 5.0
ENGINEERING AND PLANNING CRITERIA

5.1 Methodology

The methodology used for evaluating the selected trunk sewers directly affects the accuracy and usefulness of the recommendations made in this report. Therefore, the methodology was carefully developed based upon experience from past studies and the objectives of this evaluation. The methodology adopted is based upon the following:

- Flow monitoring at key manholes in the selected trunk sewers,
- Current and projected population,
- Projected land use,
- System characteristics, and
- Current software tools.

The methodology used was as follows:

PEAK FLOWS BASED UPON EXISTING CONDITIONS

1. Base mapping was prepared using information provided by the City (See **Figures 1 and 8**).
2. The trunk sewers to be evaluated were identified based upon their importance to the operation of the overall system and from operation observations by City personnel.
3. The locations of flow monitoring stations were identified based upon optimum locations to monitor flow in the entire length of trunk sewers; and the observed physical characteristics of the manholes and flow (**Figures 1 and 8**).
4. Manholes where sewage may flow in two directions downstream (split manholes) were identified and drawings of each received from the City.
5. Flow meters were placed in the monitoring manholes and maintained for a two-week period. Data sheets describing each monitoring manhole were prepared and photos of each monitoring manhole taken.[2]
6. Based upon information provided by the flow meters, flows in the monitoring manholes were presented in table and hydrograph form.
7. Reaches were identified in each trunk to facilitate assessing flows. Reaches were identified by changes in pipe size in each trunk sewer.
8. The number and type of buildings (from aerial photographs) discharging to each reach were counted. An average number of occupants per building type was applied to the building count to determine the approximate population in each reach.

[2] The monitoring results data sheets and photos are included in the separately bound "City of Kingman, Arizona, Flow Monitoring Program" by Wade and Associates

9. The actual average daily flows from the flow monitoring data (minus non-residential flow), and the estimated current population data, were used to determine per capita flows in the service areas discharging to each trunk sewer (see Section 5.2 below).
10. As-built drawings for each of the trunk sewers were obtained from the City. Rim Elevations and inverts for key manholes are shown in **Figures 3 and 10**.
11. The as-built information was supplemented by surveying.
12. The following characteristics associated with each existing trunk sewer were keyed into the SewerCad program:

    a. Pipe diameters, lengths, inverts, slopes, and rim elevations
    b. Current population data
    c. Per capita flows (determined in 9 above)
    d. Non-residential acreages and estimated per acre flows
    e. The peaking formula developed from the flow monitoring data

13. The sewer model was run to determine the estimated peak flows in each significant reach. This was compared to the design capacity of each section of trunk sewer, as calculated by the SewerCAD, to determine which, if any, portions of the sewers have insufficient capacity. The manhole identification numbers are shown on **Figures 6 and 12.**

PEAK FLOWS BASED UPON FUTURE CONDITIONS

14. Estimated populations and non-residential acreages from anticipated future development or service to existing houses currently on septic tanks that will affect the selected trunk sewers (from the City's Land Use Plan, **Figures 2 and 9**) were then keyed into the model.
15. The sewer model was run a second time to determine the estimated peak flows at build-out. This was also compared to the design capacities of the trunk sewers as determined by SewerCAD.
16. For those existing sewers that are undersized for current or estimated future flows, the diameters of parallel sewers (laid at the slope of the existing sewers) required to accommodate the peak flows were calculated.
17. The cost of installing the proposed parallel sewers was estimated.

5.2 Unit Flow Analysis

The current population estimate of Planning Area 1 was based upon a count of existing houses, apartments, etc. in the planning area; and an estimated number of people per unit.

Once the current population for the wastewater planning areas was estimated, the next step was to develop per capita flows for the existing population. This per capita flow analysis included the following steps:

1. Field flow monitoring was performed on the selected trunk sewers in the two planning areas. Flow meters were placed at 6 key manhole locations as shown on **Figures 1 and 8**. These sites

were selected at locations on the major trunk sewers so that actual flows could be developed for each trunk sewer selected for evaluation. The sites were selected with City input, and the selected manholes were viewed and marked in the field, on February 21, 2002.

2. Wade & Associates was subcontracted to monitor flows in each of the six (6) manholes from March 19, 2002 through April 2, 2002. The findings of this effort are presented in a separately bound report entitled "***City of Kingman, Arizona, Flow Monitoring Program***". Metered average daily, maximum, and minimum flows at each site are shown in the following table.

Table 5-1
Meter Flows

Monitoring Manhole Number	Trunk Sewer Name	Metered Average Daily Flow (MGD)	Metered Maximum Flow (MGD)	Metered Minimum Flow (MGD)
1	Airway West	0.10	0.28	0.01
2	Kino	0.22	0.51	0.04
3	Harrison St.	0.19	0.67	0.02
4	Fairgrounds	0.51	0.95	0.16
5	East Trunk	0.14	0.39	0.02
6	Airport Trunk	0.08	0.41	0.03

3. Non-residential wastewater flows from existing schools, motels, hotels, and hospitals in the planning area were estimated based upon the number of units identified through published sources and direct contact.
4. Other non-residential flow from commercial and industrial units was estimated based upon the area occupied by these units (in acres) and an estimate (based upon historical use) of the gallons per acre per day produced.
5. Finally, a per capita unit flow in gallons per day was calculated based on the actual average flows in the system, minus non-residential flows, and divided by the estimated upstream connected residential population in each service area.

The results of the analysis, calculations and flow monitoring described above are summarized as follows:

Table 5-2
Existing System Residential Wastewater Flow Component Analysis

Monitoring MH/Service Area/Trunk Sewer	Metered Average Flow (GPD)	Estimated Connected Population	Estimated Non-Residential Flow	Estimated Residential Flow (GPD)	Per Capita Unit Flow (GPCD)
1	100,000	609	48,000	52,000	85
2	220,000	1,643	81,000	139,000	84
3	190,000	1,370	79,000	111,000	81
4	510,000	3,105	260,000	250,000	80
5	140,000	2,205	0	140,000	64
6	80,000	5	79,575	425	85

For future residential and non-residential development in the service areas, the appropriate per capita, or per acre unit flows, were applied to anticipated development in each area based upon the City's Land Use Plan.

5.3 Evaluation Of Existing Conditions

Following the input of data into SewerCAD in accordance with Section 5.1, the model was run for existing conditions. Calculated peak flows throughout the selected trunk sewers for Planning Areas 1 and 2 were developed by the computer model and compared against existing capacities in the system. From this computer analysis, it was determined that there are minimal deficiencies in the existing trunk sewers in both Planning Areas 1 and 2 for current conditions. The surcharging identified was limited to only a few sections of pipe between manholes. These sections of pipe should be observed periodically during times of peak flow to determine if problems exist, if so, what their severity is, and whether or not future actions are required. These sections are identified in Appendix C and in Figures 5A and 11A.

5.4 Future Wastewater Flow Projections

Average daily wastewater flow projections for the service areas in the Planning Areas are shown in the following table:

Table 5-3

Monitoring MH/ Service Area/ Trunk Sewer	Existing Average Daily Flow (MGD)	Additional Future Average Daily Flow (MGD)	Total Future Average Daily Flow (MGD)
1	0.10	0.995	1.095
2	0.22	0.509	0.729
3	0.19	0.434	0.624
4	0.51	0.488	0.998
5	0.14	4.083	4.223
6	0.08	1.650	1.730

5.5 Evaluation Of Future Conditions

Following the computation of peak flows resulting from existing development, the following additional data was input into the computer to model anticipated future peak flows:

- Future population data, and non-residential use acreages, based upon the Cities zoning plan.

- Per capita unit flows of 85 gallons per day (for future development) as derived from flow monitoring, land use characterization and population density.
- Peak flow equation as derived from flow monitoring calculations.

The model was then run again to develop peak flows through the selected trunk sewers at buildout. These flows were compared against existing capacities in the system. The model indicates that some trunk sewer sections in Planning Area 1 will be overloaded at buildout. This includes sections of the East Trunk Sewer that could be overloaded by average flows as developments from the east side are connected to the sewer. Also, sections of the Airway West Trunk, Kino Trunk, Fairgrounds Trunk, Harrison Trunk, and additional portions of the east Trunk are anticipated to be overloaded by future peak flows. These sections are identified by negative flows under the "Excess Design Capacity" column in Appendices D and E.

The model also indicates that portions of the Airport trunk sewer will be overloaded if development meets the total allowed by zoning. This also is indicated in Appendix E.

SECTION 6.0
PROPOSED IMPROVEMENTS

6.1 General

In order to address the anticipated surcharging indicated by the model (See Section 5), some future paralleling of the selected trunk sewers will be required.

6.2 Planning Area 1

The locations and sizes of proposed parallel sewers are shown on Figure 7. The model shows that some portions of the sewer will be overloaded by average flows. These portions are shown in green. They are shown to accentuate the portions of the sewer that are most likely to overload first.

6.3 Planning Area 2

The Airport Trunk Sewer is anticipated to be overloaded at buildout. The portions of parallel sewer required are shown in Figure 13.

SECTION 7.0

PRELIMINARY COST ESTIMATES

7.0 General

The preliminary cost estimates for the proposed interceptor sewers, including manholes, and pavement replacement and a potential 25% contingency cost, are shown below. Appendix F contains a complete breakdown of the estimated costs of all proposed improvements.

TABLE 7-1

TRUNK SEWER IMPROVEMENTS

		Length of Proposed Parallel Sewer at Build-out (Linear Feet)						
No.	**Trunk Sewer**	**8 inch**	**10 inch**	**12 inch**	**15 inch**	**18 inch**	**Total**	**Cost**
1	Airway West	2,908	1,376				4,284	$188,508
2	Kino	200	400				600	$29,969
3	Harrison Street	3,811		359			4,170	$224,617
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5	East Trunk	8,371	4,520			3,220	16,111	$983,184
6	Airport	700		5,895		35	6,630	$289,397
	TOTAL	**23,510**	**6,296**	**6,244**	**0**	**3,255**	**39,305**	**$2,033,245**

Appendix

Appendix A:

Per Capita Flow Calculations

CITY OF KINGMAN
FLOW MONITORING PROGRAM
WASTEWATER PRODUCTION RATE

Flow Monitoring Site	Residential Data: Number of Housing Units	People Per Household	Number of Apartments	People per Apartment	Number of Mobile Units	People per Unit	Service Population	Wade Report Average Flow Rate in mgd	Commercial Data: Area in Acres	Estimated Flow gpapd	Total Flow in mgd	Inside Water Usage in mgd
1	75	3.28	167	2.00	49	2.00	679	0.10	41	720	0.030	0.030
2	670	2.47	75	1.50	35	1.50	1817	0.22	27	1218	0.033	0.033
3	337	2.61	210	2.00	71	2.00	1440	0.19	115	462	0.053	0.053
4	1310	2.40	265	2.00	0	2.00	3669	0.51	116	491	0.057	0.057
5	630	2.47	80	1.50	24	1.50	1710	0.14	53	85	0.005	0.005
6	36	3.42	0	2.00	119	2.00	361	0.08	N/A	N/A	0.0538	0.054

Flow Monitoring Site	Hotels/Motels: Number of Rooms	Estimated Flow gprpd	Total Flow in mgd	Schools: Number of Students	Estimated Flow gpspd	Total Flow in mgd	Hospitals: Number of Beds	Estimated Flow gpbpd	Total Flow in mgd	Residential Flow in mgd	Residential Production Rate gpcpd	Wade Report Ave Flow Rate in mgd
1	0	0	0.0000	0	0	0.0000	537	40	0.0215	0.0490	72	0.10
2	0	0	0.0000	0	0	0.0000	8	200	0.0016	0.1854	102	0.22
3	485	30	0.0146	1628	10	0.0163	74	40	0.0030	0.1031	72	0.19
4	214	100	0.0214	1024	30	0.0307	0	0	0.0000	0.4009	109	0.51
5	0	0	0.0000	1238	10	0.0124	0	0	0.0000	0.1231	72	0.14
6	0	0	0.0000	0	0	0.0000	0	0	0.0000	0.0262	73	0.08

Appendix B:

Model Results: Average Flow for Existing Conditions

Appendix B:

Model Results: Average Flow for Existing Conditions

Scenario: Present Day-Average Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
A-P1	A-MH1	3,511.25	ETL-MH12	3,497.23	234.00	0.025	8 inch	19.3	1.912	1.886
A-P2	A-MH2	3,514.63	A-MH1	3,511.25	260.00	0.022	8 inch	12.9	0.890	0.868
A-P3	A-MH3	3,517.88	A-MH2	3,514.63	250.00	0.020	8 inch	12.2	0.890	0.871
A-P4	A-MH4	3,521.13	A-MH3	3,517.88	250.00	0.017	8 inch	11.3	0.890	0.874
A-P5	A-MH5	3,524.25	A-MH4	3,521.13	240.00	0.014	8 inch	10.4	0.890	0.876
A-P6	A-MH6	3,527.63	A-MH5	3,524.25	260.00	0.011	8 inch	9.4	0.890	0.879
A-P7	A-MH7	3,530.88	A-MH6	3,527.63	250.00	0.008	8 inch	8.3	0.890	0.882
A-P8	A-MH8	3,534.13	A-MH7	3,530.88	250.00	0.006	8 inch	6.9	0.890	0.885
A-P9	A-MH9	3,537.38	A-MH8	3,534.13	250.00	0.003	8 inch	5.3	0.890	0.888
AET-P1	AET-MH2	3,394.14	AET-MH1	3,389.97	375.66	0.000	12 inch	19.1	2.426	2.426
AET-P2	AET-MH3	3,395.65	AET-MH2	3,394.14	354.33	0.000	12 inch	0.0	1.503	1.503
AET-P3	AET-MH4	3,396.55	AET-MH3	3,395.65	212.38	0.000	12 inch	0.0	1.499	1.499
AET-P4	AET-MH5	3,398.85	AET-MH4	3,396.55	308.40	0.000	12 inch	0.0	1.988	1.988
AET-P5	AET-MH6	3,399.03	WT-MH1	3,398.85	322.62	0.000	10 inch	0.0	0.334	0.334
AET-P6	AET-MH7	3,400.00	AET-MH6	3,399.03	325.00	0.000	10 inch	0.0	0.774	0.774
AET-P7	AET-MH8	3,400.50	AET-MH7	3,400.00	300.00	0.000	10 inch	0.0	0.578	0.578
AET-P8	AET-MH9	3,401.80	AET-MH8	3,400.50	300.00	0.000	10 inch	0.0	0.932	0.932
AET-P9	AET-MH10	3,402.70	AET-MH9	3,401.80	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P10	AET-MH11	3,403.60	AET-MH10	3,402.70	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P11	AET-MH12	3,404.50	AET-MH11	3,403.60	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P12	AET-MH13	3,405.40	AET-MH12	3,404.50	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P13	AET-MH14	3,406.30	AET-MH13	3,405.40	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P14	AET-MH15	3,407.20	AET-MH14	3,406.30	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P15	AET-MH16	3,409.30	AET-MH15	3,407.20	300.00	0.000	8 inch	0.0	0.653	0.653
AET-P16	AET-MH17	3,411.10	AET-MH16	3,409.30	300.20	0.000	8 inch	0.0	0.605	0.605
AET-P17	AET-MH18	3,413.85	AET-MH17	3,411.10	325.82	0.000	8 inch	0.0	0.717	0.717
AET-P18	AET-MH19	3,416.91	AET-MH18	3,413.85	314.18	0.000	8 inch	0.0	0.771	0.771
AET-P19	AET-MH20	3,418.96	AET-MH19	3,416.91	340.82	0.000	8 inch	0.0	0.606	0.606
AET-P20	AET-MH21	3,421.00	AET-MH20	3,418.96	339.18	0.000	8 inch	0.0	0.606	0.606
AET-P21	AET-MH22	3,423.67	AET-MH21	3,421.00	340.00	0.000	8 inch	0.0	0.692	0.692
AET-P23	AET-MH24	3,429.00	AET-MH23	3,426.35	337.49	0.000	8 inch	0.0	0.692	0.692
AET-P24	AET-MH25	3,431.39	AET-MH24	3,429.00	197.85	0.000	8 inch	0.0	0.858	0.858
AET-P25	AET-MH26	3,435.25	AET-MH25	3,431.39	319.12	0.000	8 inch	0.0	0.859	0.859
AETS-P1	AET-MH23	3,426.35	ETU-MH1	3,419.83	457.68	0.000	12 inch	9.0	2.748	2.748
AF-P1	AF-MH1	3,545.65	WS-MH21	3,540.55	500.00	0.000	12 inch	0.0	2.325	2.325
AF-P2	AF-MH2	3,553.04	AF-MH1	3,545.65	500.00	0.000	12 inch	0.0	2.799	2.799
AF-P3	AF-MH3	3,558.23	AF-MH2	3,553.23	500.00	0.000	12 inch	0.0	2.303	2.303
AF-P4	AF-MH4	3,562.35	AF-MH3	3,558.33	500.00	0.000	12 inch	0.0	2.065	2.065
AF-P5	AF-MH5	3,566.60	AF-MH4	3,562.35	500.00	0.000	12 inch	0.0	2.123	2.123
AF-P6	AF-MH6	3,570.39	AF-MH5	3,566.60	500.00	0.000	12 inch	0.0	2.005	2.005
AF-P7	AF-MH7	3,574.43	AF-MH6	3,570.39	500.00	0.000	12 inch	0.0	2.070	2.070
AF-P8	AF-MH8	3,579.87	AF-MH7	3,574.53	500.00	0.000	12 inch	0.0	2.380	2.380
AF-P9	AF-MH9	3,583.53	AF-MH8	3,579.97	500.00	0.000	12 inch	0.0	1.943	1.943
AF-P10	AF-MH10	3,587.09	AF-MH9	3,583.53	500.00	0.000	12 inch	0.0	1.943	1.943
AF-P11	AF-MH11	3,590.52	AF-MH10	3,587.09	483.57	0.000	12 inch	0.0	1.939	1.939
ALE-P1	ALE-MH1	3,436.22	ETL-MH38	3,435.05	132.00	0.000	8 inch	13.7	0.735	0.735
ALE-P2	ALE-MH2	3,436.88	ALE-MH1	3,436.22	69.00	0.000	8 inch	0.0	0.764	0.764
ALE-P3	ALE-MH3	3,439.18	ALE-MH2	3,436.88	250.00	0.000	8 inch	0.0	0.749	0.749
ALE-P4	ALE-MH4	3,440.86	ALE-MH3	3,439.18	250.00	0.000	8 inch	0.0	0.640	0.640
ALE-P5	ALE-MH5	3,442.43	ALE-MH4	3,440.86	250.00	0.000	8 inch	0.0	0.619	0.619
ALE-P6	ALE-MH6	3,444.26	ALE-MH5	3,442.43	250.00	0.000	8 inch	0.0	0.668	0.668

Scenario: Present Day-Average Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
ALE-P7	ALE-MH7	3,445.58	ALE-MH6	3,444.26	250.00	0.000	8 inch	0.0	0.567	0.567
ALE-P8	ALE-MH8	3,447.50	ALE-MH7	3,445.58	250.00	0.000	8 inch	0.0	0.684	0.684
ALE-P9	ALE-MH9	3,448.09	ALE-MH8	3,447.50	148.00	0.000	8 inch	0.0	0.493	0.493
AT-P1	AT-MH1	3,371.75	WT-MH9	3,369.95	352.00	0.830	21 inch	25.8	7.323	6.493
AT-P2	AT-MH2	3,369.43	AT-MH3	3,367.19	576.17	1.020	21 inch	27.0	6.385	5.365
AT-P3	AT-MH3	3,367.19	AT-MH4	3,364.86	597.00	1.020	21 inch	27.0	6.397	5.377
AT-P4	AT-MH4	3,364.86	AT-MH5	3,362.55	593.00	1.020	21 inch	27.0	6.391	5.371
AT-P5	AT-MH5	3,362.55	AT-MH6	3,361.39	297.00	1.020	21 inch	27.0	6.400	5.380
AT-P6	AT-MH6	3,361.39	AT-MH7	3,359.36	520.00	1.020	21 inch	27.0	6.398	5.378
AT-P7	AT-MH7	3,359.36	AT-MH8	3,357.36	514.00	1.020	21 inch	27.0	6.388	5.368
AT-P8	AT-MH8	3,357.36	AT-MH9	3,355.35	516.00	1.020	21 inch	26.7	6.391	5.371
AT-P9	AT-MH9	3,355.35	AT-MH10	3,353.17	517.16	1.020	21 inch	27.0	6.649	5.629
AT-P10	AT-MH10	3,353.17	AT-MH11	3,349.90	504.44	1.160	21 inch	26.4	8.245	7.085
AT-P11	AT-MH11	3,349.90	AT-MH12	3,349.35	70.15	1.160	21 inch	25.8	9.067	7.907
AT-P12	AT-MH12	3,349.35	O-1	3,345.77	425.00	1.160	21 inch	25.6	9.399	8.239
AWTL-P7	AWTL-MH7	3,443.06	AWTL-MH8	3,441.16	520.00	0.000	8 inch	3.0	0.472	0.472
AWTL-P8	AWTL-MH8	3,441.16	AWTL-MH9	3,439.67	248.00	0.004	8 inch	7.2	0.605	0.601
AWTL-P9	AWTL-MH9	3,439.67	AWTL-MH10	3,438.17	250.00	0.009	8 inch	9.3	0.605	0.596
AWTL-P10	AWTL-MH10	3,438.17	AWTL-MH11	3,436.67	250.00	0.013	8 inch	10.9	0.605	0.592
AWTL-P11	AWTL-MH11	3,436.67	AWTL-MH12	3,435.17	250.00	0.017	8 inch	12.3	0.605	0.588
AWTL-P12	AWTL-MH12	3,435.17	AWTL-MH13	3,433.28	315.00	0.022	8 inch	13.6	0.605	0.583
AWTL-P13	AWTL-MH13	3,433.28	AWTL-MH14	3,431.68	267.00	0.026	8 inch	14.5	0.605	0.578
AWTL-P14	AWTL-MH14	3,431.68	AWTL-MH15	3,429.85	262.00	0.030	8 inch	15.3	0.653	0.622
AWTL-P15	AWTL-MH15	3,429.85	AWTL-MH16	3,428.02	262.00	0.035	8 inch	16.3	0.653	0.618
AWTL-P16	AWTL-MH16	3,428.02	AWTL-MH17	3,426.19	262.00	0.039	8 inch	17.2	0.653	0.614
AWTL-P17	AWTL-MH17	3,426.19	AWTL-MH18	3,424.20	267.00	0.043	8 inch	18.1	0.674	0.631
AWTL-P18	AWTL-MH18	3,424.20	AWTL-MH19	3,420.14	338.00	0.048	8 inch	18.9	0.856	0.808
AWTL-P19	AWTL-MH19	3,420.14	AWTL-MH20	3,417.64	208.00	0.052	8 inch	19.7	0.856	0.804
AWTL-P20	AWTL-MH20	3,417.64	AWTL-MH21	3,412.48	430.00	0.057	8 inch	20.6	0.856	0.799
AWTL-P21	AWTL-MH21	3,412.48	AWTL-MH22	3,408.97	255.00	0.061	8 inch	21.9	0.916	0.855
AWTL-P22	AWTL-MH22	3,408.97	AWTL-MH23	3,407.77	299.11	0.065	10 inch	18.5	0.897	0.832
AWTL-P23	AWTL-MH23	3,407.77	AWTL-MH24	3,406.37	350.00	0.070	10 inch	18.9	0.896	0.826
AWTL-P24	AWTL-MH24	3,406.37	AWTU-MH4	3,404.94	326.45	0.074	10 inch	19.2	0.937	0.863
AWTU-P1	AWTU-MH1	3,409.61	AWTU-MH2	3,407.39	240.00	0.004	12 inch	4.0	2.215	2.210
AWTU-P2	AWTU-MH2	3,407.39	AWTU-MH3	3,406.44	101.59	0.009	12 inch	5.2	2.227	2.218
AWTU-P3	AWTU-MH3	3,406.44	AWTU-MH4	3,404.94	84.04	0.013	12 inch	11.0	3.076	3.063
AWTU-P4	AWTU-MH4	3,404.94	AWTU-MH5	3,402.70	223.55	0.091	10 inch	19.6	1.417	1.326
AWTU-P5	AWTU-MH5	3,402.70	AWTU-MH6	3,398.70	400.00	0.096	10 inch	21.2	1.416	1.320
AWTU-P6	AWTU-MH6	3,398.70	AWTU-MH7 (M	3,397.10	400.00	0.100	10 inch	21.4	0.896	0.796
AWTU-P7	AWTU-MH7 (MM	3,397.10	AWTU-MH8	3,393.83	400.00	0.100	10 inch	33.0	1.280	1.180
AWTU-P8	AWTU-MH8	3,393.83	AWTU-MH9	3,391.87	265.75	0.610	15 inch	31.7	3.585	2.975
AWTU-P9	AWTU-MH9	3,391.87	AWTU-MH10	3,390.23	415.03	0.610	15 inch	31.7	2.624	2.014
AWTU-P10	AWTU-MH10	3,390.23	AET-MH1	3,389.97	14.76	0.610	15 inch	26.7	5.540	4.930
BUR-P1	AET-MH1	3,389.97	BUR-MH1	3,387.70	356.06	0.610	15 inch	29.7	3.333	2.723
BUR-P2	BUR-MH1	3,387.70	BUR-MH2	3,384.94	524.00	0.610	15 inch	30.5	3.030	2.420
BUR-P3	BUR-MH2	3,384.94	BUR-MH3	3,381.40	525.00	0.610	15 inch	29.5	3.428	2.818
BUR-P4	BUR-MH3	3,381.40	BUR-MH4	3,377.85	535.00	0.610	15 inch	38.5	3.401	2.791
BUR-P5	BUR-MH4	3,377.85	BUR-MH5	3,376.23	592.00	0.610	15 inch	33.3	2.184	1.574
BUR-P6	BUR-MH5	3,376.23	BUR-MH6	3,373.16	295.28	0.610	15 inch	28.0	4.257	3.647
BUR-P7	BUR-MH6	3,373.16	AT-MH1	3,371.75	220.40	0.610	15 inch	31.5	3.339	2.729
DT-P1	DT-MH1	3,473.50	DT-MH2	3,470.00	130.00	0.004	12 inch	4.2	3.778	3.774

Scenario: Present Day-Average Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
DT-P2	DT-MH2	3,470.00	DT-MH3	3,468.93	357.70	0.007	12 inch	5.4	1.259	1.252
DT-P3	DT-MH3	3,468.93	DT-MH4	3,467.29	198.06	0.011	12 inch	5.7	2.095	2.084
DT-P4	DT-MH4	3,467.29	DT-MH5	3,466.50	96.22	0.015	12 inch	6.7	2.086	2.072
DT-P5	DT-MH5	3,466.50	DT-MH6	3,464.45	400.00	0.018	12 inch	7.4	1.648	1.630
DT-P6	DT-MH6	3,464.45	DT-MH7	3,461.40	405.00	0.022	12 inch	7.8	1.998	1.976
DT-P7	DT-MH7	3,461.40	DT-MH8	3,458.35	400.00	0.026	12 inch	8.3	2.011	1.985
DT-P8	DT-MH8	3,458.35	DT-MH9	3,452.93	400.00	0.029	12 inch	8.9	2.680	2.651
DT-P9	DT-MH9	3,452.93	DT-MH10	3,447.50	410.00	0.033	12 inch	9.8	2.650	2.617
DT-P10	DT-MH10	3,447.50	DT-MH11	3,445.60	400.00	0.037	12 inch	10.3	1.587	1.550
DT-P11	DT-MH11	3,445.60	HT-MH19	3,441.01	272.00	0.040	12 inch	15.2	2.991	2.951
ETL-P2	ETL-MH2	3,506.53	ETL-MH3	3,505.43	324.00	0.022	12 inch	9.5	1.342	1.319
ETL-P3	ETL-MH3	3,505.43	ETL-MH4	3,504.56	325.00	0.025	12 inch	10.3	1.191	1.166
ETL-P4	ETL-MH4	3,504.56	ETL-MH5	3,503.70	329.00	0.028	12 inch	10.8	1.177	1.149
ETL-P5	ETL-MH5	3,503.70	ETL-MH6	3,502.73	346.00	0.031	12 inch	11.2	1.219	1.188
ETL-P6	ETL-MH6	3,502.73	ETL-MH7	3,501.90	308.00	0.034	12 inch	11.8	1.195	1.162
ETL-P7	ETL-MH7	3,501.90	ETL-MH8	3,501.01	330.00	0.036	12 inch	12.2	1.196	1.159
ETL-P8	ETL-MH8	3,501.01	ETL-MH9	3,500.12	331.00	0.039	12 inch	12.4	1.194	1.155
ETL-P9	ETL-MH9	3,500.12	ETL-MH10	3,499.23	292.00	0.042	12 inch	12.9	1.271	1.229
ETL-P10	ETL-MH10	3,499.23	ETL-MH11	3,498.24	374.00	0.045	12 inch	13.3	1.185	1.140
ETL-P11	ETL-MH11	3,498.24	ETL-MH12	3,497.23	337.00	0.048	12 inch	15.1	1.261	1.213
ETL-P12	ETL-MH12	3,497.23	ETL-MH13	3,496.53	250.00	0.076	12 inch	17.0	1.218	1.143
ETL-P13	ETL-MH13	3,496.53	ETL-MH14	3,495.83	250.00	0.078	12 inch	17.1	1.218	1.140
ETL-P14	ETL-MH14	3,495.83	ETL-MH15	3,495.03	250.00	0.081	12 inch	15.8	1.303	1.221
ETL-P15	ETL-MH15	3,495.03	ETL-MH16	3,492.61	250.00	0.084	12 inch	14.8	2.265	2.181
ETL-P16	ETL-MH16	3,492.61	ETL-MH17	3,490.81	250.00	0.087	12 inch	15.1	1.954	1.867
ETL-P17	ETL-MH17	3,490.81	ETL-MH18	3,488.52	304.00	0.090	12 inch	17.0	1.998	1.909
ETL-P18	ETL-MH18	3,488.52	ETL-MH19	3,487.24	473.00	0.092	12 inch	18.8	1.198	1.105
ETL-P19	ETL-MH19	3,487.24	ETL-MH20	3,485.93	448.00	0.095	12 inch	17.3	1.245	1.150
ETL-P20	ETL-MH20	3,485.93	ETL-MH21	3,485.75	30.00	0.098	12 inch	17.8	1.784	1.686
ETL-P21	ETL-MH21	3,485.75	ETL-MH22	3,484.40	501.00	0.101	12 inch	19.6	1.195	1.094
ETL-P22	ETL-MH22	3,484.40	ETL-MH23	3,482.95	496.00	0.104	12 inch	18.1	1.245	1.141
ETL-P23	ETL-MH23	3,482.95	ETL-MH24	3,478.64	255.00	0.106	12 inch	16.7	2.994	2.887
ETL-P24	ETL-MH24	3,478.64	ETL-MH25	3,472.21	383.00	0.109	12 inch	16.9	2.983	2.874
ETL-P25	ETL-MH25	3,472.21	ETL-MH26	3,467.03	385.00	0.112	12 inch	17.5	2.671	2.559
ETL-P26	ETL-MH26	3,467.03	ETL-MH27	3,465.04	398.00	0.115	12 inch	18.0	1.628	1.513
ETL-P27	ETL-MH27	3,465.04	ETL-MH28	3,462.90	402.00	0.118	12 inch	18.5	1.680	1.562
ETL-P28	ETL-MH28	3,462.90	ETL-MH29	3,461.16	402.00	0.120	12 inch	19.2	1.515	1.394
ETL-P29	ETL-MH29	3,461.16	ETL-MH30	3,459.42	402.00	0.123	12 inch	19.4	1.515	1.392
ETL-P30	ETL-MH30	3,459.42	ETL-MH31	3,457.68	402.00	0.126	12 inch	19.6	1.515	1.389
ETL-P31	ETL-MH31	3,457.68	ETL-MH32	3,455.94	402.00	0.129	12 inch	19.7	1.515	1.386
ETL-P32	ETL-MH32	3,455.94	ETL-MH33	3,454.13	402.00	0.132	12 inch	19.2	1.545	1.413
ETL-P33	ETL-MH33	3,454.13	ETL-MH34	3,451.50	402.00	0.134	12 inch	18.9	1.862	1.728
ETL-P34	ETL-MH34	3,451.50	ETL-MH35	3,449.22	404.00	0.137	12 inch	19.0	1.730	1.593
ETL-P35	ETL-MH35	3,449.22	ETL-MH36 (M	3,444.25	404.00	0.140	12 inch	17.5	2.554	2.414
ETL-P36	ETL-MH36 (MMH	3,444.25	ETL-MH37	3,437.82	404.00	0.140	12 inch	17.0	2.905	2.765
ETL-P37	ETL-MH37	3,437.82	ETL-MH38	3,435.05	177.00	0.140	12 inch	17.1	2.880	2.740
ETL-P38	ETL-MH38	3,435.05	ETL-MH39	3,432.32	219.00	0.140	14 inch	14.3	3.878	3.738
ETL-P39	ETL-MH39	3,432.32	ETL-MH40	3,430.33	357.00	0.140	15 inch	14.9	3.117	2.977
ETL-P40	ETL-MH40	3,430.33	ETL-MH41	3,427.71	369.09	0.140	12 inch	18.3	2.102	1.962
ETL-P41	ETL-MH41	3,427.71	ETL-MH42	3,425.08	216.54	0.140	12 inch	17.2	2.749	2.609
ETL-P42	ETL-MH42	3,425.08	ETL-MH43	3,423.53	234.58	0.140	12 inch	18.4	2.028	1.888

Scenario: Present Day-Average Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
ETL-P43	ETL-MH43	3,423.53	ETL-MH44	3,421.85	273.95	0.140	12 inch	18.6	1.953	1.813
ETL-P44	ETL-MH44	3,421.85	ETU-MH1	3,419.83	249.34	0.140	15 inch	13.8	3.758	3.618
ETL-WST-P1	WS-MH1	3,465.30	ETL-MH28	3,462.90	131.92	0.000	12 inch	9.5	3.106	3.106
ETL Overflow	ETL-Overflow	3,507.30	ETL-HTL MH	3,504.06	321.52	0.000	8 inch	0.0	0.784	0.784
ETLL1-P1	ETLL1-MH1	3,517.77	ETLL1-MH2	3,517.08	14.00	0.003	12 inch	3.3	5.112	5.109
ETLL1-P2	ETLL1-MH2	3,517.08	ETLL1-MH3	3,515.56	238.00	0.006	12 inch	4.3	1.840	1.835
ETLL1-P3	ETLL1-MH3	3,515.56	ETLL1-MH4	3,513.42	267.00	0.008	12 inch	5.0	2.061	2.053
ETLL1-P4	ETLL1-MH4	3,513.42	ETLL1-MH5	3,511.38	243.00	0.011	12 inch	5.9	2.110	2.099
ETLL1-P5	ETLL1-MH5	3,511.38	ETLL1-MH6	3,510.00	260.00	0.014	12 inch	6.5	1.678	1.664
ETLL1-P6	ETLL1-MH6	3,510.00	ETLL1-MH7	3,506.79	391.00	0.017	12 inch	6.9	2.086	2.070
ETLL1-P7	ETLL1-MH7	3,506.79	ETL-MH2	3,506.53	41.01	0.020	12 inch	8.1	1.833	1.814
ETLL2-P1	ETLL2-MH1	3,505.97	ETLL2-MH2	3,504.74	230.00	0.004	8 inch	7.0	0.571	0.567
ETLL2-P2	ETLL2-MH2	3,504.74	ETLL2-MH3	3,503.70	219.00	0.007	8 inch	9.4	0.538	0.531
ETLL2-P3	ETLL2-MH3	3,503.70	ETLL2-MH4	3,502.39	372.00	0.011	8 inch	11.5	0.463	0.452
ETLL2-P4	ETLL2-MH4	3,502.39	ETLL2-MH5	3,501.26	335.43	0.015	8 inch	13.0	0.453	0.439
ETLL2-P5	ETLL2-MH5	3,501.26	ETLL2-MH6	3,500.94	92.21	0.018	8 inch	13.6	0.460	0.442
ETLL2-P6	ETLL2-MH6	3,500.94	HTL-MH1	3,499.25	336.29	0.022	8 inch	13.1	0.554	0.532
ETU-P1	ETU-MH1	3,419.83	ETU-MH2	3,414.67	375.00	0.140	15 inch	13.0	4.897	4.757
ETU-P2	ETU-MH2	3,414.67	ETU-MH3	3,408.79	400.00	0.140	15 inch	12.9	5.062	4.922
ETU-P3	ETU-MH3	3,408.79	ETU-MH4	3,402.61	417.00	0.140	15 inch	12.9	5.082	4.942
ETU-P4	ETU-MH4	3,402.61	ETU-MH5	3,396.41	500.00	0.140	15 inch	13.1	4.649	4.509
ETU-P5	ETU-MH5	3,396.41	ETU-MH6	3,391.31	500.00	0.140	15 inch	13.4	4.216	4.076
ETU-P6	ETU-MH6	3,391.31	ETU-MH7	3,387.65	469.00	0.140	15 inch	13.8	3.688	3.548
ETU-P7	ETU-MH7	3,387.65	ETU-MH8	3,384.12	453.00	0.140	15 inch	13.8	3.685	3.545
ETU-P8	ETU-MH8	3,384.12	ETU-MH9	3,380.61	450.00	0.140	15 inch	13.8	3.687	3.547
ETU-P9	ETU-MH9	3,380.61	ETU-MH10	3,377.67	376.00	0.140	15 inch	13.8	3.692	3.552
ETU-P10	ETU-MH10	3,377.67	ETU-MH11	3,375.51	278.00	0.140	15 inch	13.9	3.680	3.540
ETU-P11	ETU-MH11	3,375.51	ETU-MH12	3,373.58	234.00	0.140	15 inch	13.8	3.792	3.652
ETU-P12	ETU-MH12	3,373.58	ETU-MH13	3,369.59	468.00	0.140	15 inch	13.7	3.855	3.715
ETU-P13	ETU-MH13	3,369.59	ETU-MH14	3,365.63	460.00	0.140	15 inch	13.7	3.874	3.734
ETU-P14	ETU-MH14	3,365.63	ETU-MH15	3,362.33	384.00	0.140	15 inch	13.7	3.870	3.730
ETU-P15	ETU-MH15	3,362.33	ETU-MH16	3,358.03	500.00	0.140	15 inch	13.7	3.872	3.732
ETU-P16	ETU-MH16	3,358.03	AT-MH10	3,353.17	507.00	0.140	15 inch	26.5	4.087	3.947
FT-P1	FT-MH1	3,528.89	FT-MH2	3,515.96	685.70	0.006	6 inch	11.0	0.498	0.492
FT-P2	FT-MH2	3,515.96	FT-MH3	3,513.60	103.35	0.011	6 inch	14.4	0.548	0.537
FT-P3	FT-MH3	3,513.60	FT-MH4	3,505.16	400.26	0.017	6 inch	17.1	0.527	0.509
FT-P4	FT-MH4	3,505.16	FT-MH5	3,501.77	198.49	0.023	6 inch	19.5	0.474	0.451
FT-P5	FT-MH5	3,501.77	FT-MH6	3,493.29	431.43	0.029	6 inch	20.7	0.508	0.480
FT-P6	FT-MH6	3,493.29	FT-MH7	3,491.78	123.03	0.034	8 inch	16.3	0.865	0.831
FT-P7	FT-MH7	3,491.78	FT-MH8	3,488.49	324.80	0.040	8 inch	17.5	0.786	0.746
FT-P8	FT-MH8	3,488.49	FT-MH9	3,486.90	187.01	0.046	8 inch	18.7	0.720	0.674
FT-P9	FT-MH9	3,486.90	FT-MH10	3,485.73	95.14	0.052	8 inch	19.8	0.866	0.814
FT-P10	FT-MH10	3,485.73	FT-MH11	3,483.51	159.12	0.057	8 inch	20.8	0.922	0.865
FT-P11	FT-MH11	3,483.51	FT-MH12	3,479.88	287.07	0.063	8 inch	21.8	0.878	0.815
FT-P12	FT-MH12	3,479.88	FT-MH13	3,477.96	234.58	0.069	8 inch	22.8	0.707	0.638
FT-P13	FT-MH13	3,477.96	FT-MH14	3,476.96	121.39	0.074	8 inch	23.7	0.709	0.634
FT-P14	FT-MH14	3,476.96	FT-MH15	3,475.46	147.64	0.080	8 inch	24.6	0.787	0.707
FT-P15	FT-MH15	3,475.46	FT-MH16	3,473.49	223.10	0.086	8 inch	26.3	0.734	0.648
FT-P16	FT-MH16	3,473.49	FT-MH17	3,473.36	26.25	0.092	8 inch	27.1	0.550	0.458
FT-P17	FT-MH17	3,473.36	FT-MH18	3,471.87	132.87	0.097	8 inch	27.0	0.827	0.730
FT-P18	FT-MH18	3,471.87	FT-MH19	3,470.34	159.12	0.103	8 inch	27.8	0.766	0.663

Scenario: Present Day-Average Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
MT-P32	MT-MH32	3,411.72	MT-MH33	3,408.92	399.40	0.493	12 inch	36.6	1.928	1.435
MT-P33	MT-MH33	3,408.92	MT-MH34	3,407.39	148.90	0.499	12 inch	36.8	2.334	1.836
MT-P34	MT-MH34	3,407.39	MT-MH35	3,402.29	581.00	0.504	12 inch	37.0	2.157	1.653
MT-P35	MT-MH35	3,402.29	MT-MH36 (MM	3,396.98	590.00	0.510	12 inch	35.0	2.184	1.674
MT-P36	MT-MH36 (MMH	3,396.98	AWTU-MH8	3,393.83	593.83	0.510	15 inch	29.2	3.041	2.531
OI-P1	OI-MH1	3,369.79	OT-MH2	3,366.65	585.00	0.000	15 inch	0.0	3.059	3.059
OI-P2	OT-MH2	3,366.65	OT-MH3	3,364.82	575.00	0.000	15 inch	0.0	2.355	2.355
OI-P3	OT-MH3	3,364.82	OT-MH-4	3,362.87	560.00	0.000	15 inch	0.0	2.464	2.464
OI-P4	OT-MH-4	3,362.87	OT-MH5	3,360.92	595.00	0.000	15 inch	0.0	2.390	2.390
OI-P5	OT-MH5	3,360.92	OT-MH-6	3,359.20	560.00	0.000	15 inch	0.0	2.314	2.314
OI-P6	OT-MH-6	3,359.20	OT-MH7	3,357.19	565.00	0.000	15 inch	0.0	2.490	2.490
OI-P7	OT-MH7	3,357.19	OT-MH8	3,355.37	610.00	0.000	15 inch	0.0	2.280	2.280
OI-P8	OT-MH8	3,355.37	OT-MH9	3,352.33	510.00	0.000	15 inch	0.0	3.223	3.223
OI-P9	OT-MH9	3,352.33	OT-MH10	3,351.49	510.00	0.000	15 inch	0.0	1.694	1.694
OI-P10	OT-MH10	3,351.49	O-1	3,345.77	425.00	0.000	15 inch	0.0	4.843	4.843
WM-P1	WTL-MH6	3,442.41	WM-MH1	3,439.24	272.00	0.040	10 inch	13.2	1.529	1.489
WM-P2	WM-MH1	3,439.24	WM-MH2	3,434.80	398.00	0.046	10 inch	14.3	1.496	1.450
WM-P3	WM-MH2	3,434.80	WM-MH3	3,432.84	340.00	0.052	10 inch	15.3	1.075	1.024
WM-P4	WM-MH3	3,432.84	WM-MH4	3,430.80	345.00	0.057	10 inch	16.1	1.089	1.032
WM-P5	WM-MH4	3,430.80	WM-MH5	3,429.88	170.00	0.063	10 inch	16.9	1.042	0.979
WM-P6	WM-MH5	3,429.88	WM-MH6	3,427.92	340.00	0.069	10 inch	17.5	1.075	1.006
WM-P7	WM-MH6	3,427.92	WM-MH7	3,425.96	340.00	0.074	10 inch	18.7	1.075	1.001
WM-P8	WM-MH7	3,425.96	MT-MH27	3,424.35	360.00	0.080	10 inch	24.2	0.947	0.867
WS-P1	WS-MH2	3,467.81	WS-MH1	3,465.30	233.41	0.000	12 inch	0.0	2.388	2.388
WS-P2	WS-MH3	3,470.30	WS-MH2	3,467.81	231.00	0.000	12 inch	0.0	2.391	2.391
WS-P3	WS-MH4	3,472.79	WS-MH3	3,470.30	249.00	0.000	12 inch	0.0	2.303	2.303
WS-P4	WS-MH5	3,475.28	WS-MH4	3,472.79	231.00	0.000	12 inch	0.0	2.391	2.391
WS-P5	WS-MH6	3,479.44	WS-MH5	3,475.38	249.00	0.000	12 inch	0.0	2.940	2.940
WS-P6	WS-MH7	3,482.03	WS-MH6	3,479.44	249.00	0.000	12 inch	0.0	2.348	2.348
WS-P7	WS-MH8	3,484.53	WS-MH7	3,482.03	249.94	0.000	12 inch	0.0	2.303	2.303
WS-P8	WS-MH9	3,487.48	WS-MH8	3,484.63	231.94	0.000	12 inch	0.0	2.552	2.552
WS-P9	WS-MH10	3,490.34	WS-MH9	3,487.48	249.94	0.000	12 inch	0.0	2.463	2.463
WS-P10	WS-MH11	3,492.22	WS-MH10	3,490.44	249.94	0.000	12 inch	0.0	1.943	1.943
WS-P11	WS-MH12	3,494.04	WS-MH11	3,492.22	249.94	0.000	12 inch	0.0	1.965	1.965
WS-P12	WS-MH13	3,495.96	WS-MH12	3,494.04	249.94	0.000	12 inch	0.0	2.018	2.018
WS-P13	WS-MH14	3,497.72	WS-MH13	3,495.96	231.94	0.000	12 inch	0.0	2.006	2.006
WS-P14	WS-MH15	3,499.54	WS-MH14	3,497.72	249.94	0.000	12 inch	0.0	1.965	1.965
WS-P15	WS-MH16	3,501.12	WS-MH15	3,499.54	231.94	0.000	12 inch	0.0	1.900	1.900
WS-P16	WS-MH17	3,502.96	WS-MH16	3,501.12	249.94	0.000	8 inch	0.0	0.670	0.670
WS-P17	WS-MH18	3,514.68	WS-MH17	3,503.66	500.00	0.000	12 inch	0.0	3.418	3.418
WS-P18	WS-MH19	3,525.66	WS-MH18	3,514.68	500.00	0.000	12 inch	0.0	3.412	3.412
WS-P19	WS-MH20	3,533.74	WS-MH19	3,525.76	500.00	0.000	12 inch	0.0	2.909	2.909
WSP20	WS-MH21	3,540.55	WS-MH20	3,533.74	424.40	0.000	12 inch	0.0	2.917	2.917
WT-OI-P	WT-OI-OVERFL	3,369.95	OI-MH1	3,369.79	30.00	0.000	15 inch	0.0	3.049	3.049
WT-P1	WT-MH1	3,397.50	WT-MH2	3,395.92	90.00	0.190	15 inch	14.7	5.532	5.342
WT-P2	WT-MH2	3,395.92	WT-MH3	3,394.02	189.24	0.190	15 inch	15.7	4.183	3.993
WT-P3	WT-MH3	3,394.02	WT-MH4	3,391.08	302.81	0.190	15 inch	15.7	4.114	3.924
WT-P4	WT-MH4	3,391.08	WT-MH5	3,386.23	500.00	0.190	15 inch	15.7	4.112	3.922
WT-P5	WT-MH5	3,386.23	WT-MH6	3,381.45	500.00	0.190	15 inch	15.8	4.082	3.892
WT-P6	WT-MH6	3,381.45	WT-MH7	3,376.63	500.00	0.190	15 inch	15.7	4.099	3.909
WT-P7	WT-MH7	3,376.63	WT-MH8	3,371.85	489.54	0.190	15 inch	15.7	4.125	3.935

Scenario: Present Day-Average Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
WT-P8	WT-MH8	3,371.85	WT-MH9	3,369.95	194.63	0.190	15 inch	28.3	4.125	3.935
WT-P9	WT-MH9	3,369.95	AT-MH2	3,369.43	30.00	1.020	15 inch	34.6	5.496	4.476
WTL-P1	WTL-MH1	3,454.00	WTL-MH2	3,451.00	160.00	0.006	8 inch	7.7	1.069	1.064
WTL-P2	WTL-MH2	3,451.00	WTL-MH3	3,445.71	500.00	0.011	8 inch	10.0	0.803	0.792
WTL-P3	WTL-MH3	3,445.71	WTL-MH4	3,443.94	167.32	0.017	8 inch	13.5	0.802	0.785
WTL-P4	WTL-MH4	3,443.94	WTL-MH5	3,443.19	270.67	0.023	8 inch	15.4	0.412	0.389
WTL-P5	WTL-MH5	3,443.19	WTL-MH6	3,442.41	129.59	0.029	8 inch	15.4	0.606	0.577
WTL-P6	WTL-MH7	3,443.06	WTL-MH6	3,442.41	121.39	0.006	8 inch	11.5	0.571	0.566

Appendix C:

Model Results: Peak Flow for Existing Conditions

Scenario: Present - Peak Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
A-P1	A-MH1	3,319.42	A-MH2	3,318.89	136.27	0.0118	15 inch	6.0	2.6036	2.5918
A-P2	A-MH2	3,318.89	A-MH3	3,317.70	499.17	0.0211	15 inch	7.4	2.0384	2.0173
A-P3	A-MH3	3,317.70	A-MH4	3,316.13	426.90	0.0297	15 inch	8.1	2.5318	2.5021
A-P4	A-MH4	3,316.13	A-MH5	3,314.93	345.66	0.0378	15 inch	9.3	2.4598	2.4220
A-P5	A-MH5	3,314.93	A-MH6	3,313.80	401.57	0.0457	15 inch	10.1	2.2146	2.1689
A-P6	A-MH6	3,313.80	A-MH7	3,312.78	299.57	0.0534	15 inch	45.7	2.4361	2.3827
A-P7	A-MH7	3,312.78	A-MH8	3,313.11	34.83	0.0609	15 inch	67.9	-4.0637	-4.1246
A-P8	A-MH8	3,313.11	A-MH9	3,311.65	365.61	0.0683	15 inch	11.9	2.6382	2.5699
A-P9	A-MH9	3,311.65	A-MH10	3,310.53	399.84	0.0756	15 inch	12.8	2.2096	2.1340
A-P10	A-MH10	3,310.53	A-MH11	3,309.60	299.71	0.0827	15 inch	13.4	2.3256	2.2429
A-P11	A-MH11	3,309.60	A-MH12	3,307.86	629.50	0.0898	15 inch	13.9	2.1949	2.1051
A-P12	A-MH12	3,307.86	A-MH13	3,305.99	626.95	0.0968	15 inch	14.4	2.2801	2.1833
A-P13	A-MH13	3,305.99	A-MH14	3,304.25	628.05	0.1037	15 inch	15.0	2.1974	2.0938
A-P14	A-MH14	3,304.25	A-MH15	3,302.47	630.87	0.1105	15 inch	15.4	2.2176	2.1071
A-P15	A-MH15	3,302.47	A-MH16	3,301.79	242.94	0.1173	15 inch	15.9	2.2087	2.0914
A-P16	A-MH16	3,301.79	A-MH17	3,300.75	383.11	0.1241	15 inch	16.4	2.1752	2.0511
A-P17	A-MH17	3,300.75	A-MH18	3,299.00	627.66	0.1307	15 inch	16.7	2.2044	2.0737
A-P18	A-MH18	3,299.00	A-MH19	3,297.23	630.84	0.1374	15 inch	16.9	2.2114	2.0740
A-P19	A-MH19	3,297.23	A-MH20	3,295.53	234.33	0.1440	15 inch	15.2	3.5559	3.4119
A-P20	A-MH20	3,295.53	A-MH21	3,294.00	421.16	0.1505	15 inch	16.6	2.5163	2.3658
A-P21	A-MH21	3,294.00	A-MH22	3,293.20	52.00	0.1570	16 inch	15.5	6.1507	5.9937
A-P22	A-MH22	3,293.20	A-MH23	3,292.92	198.25	0.1635	16 inch	20.0	1.8636	1.7001
A-P23	A-MH23	3,292.92	A-MH24	3,291.77	389.75	0.1700	16 inch	17.0	2.6936	2.5237
A-P24	A-MH24	3,291.77	A-MH25	3,289.47	200.00	0.1764	16 inch	13.2	5.3178	5.1414
A-P25	A-MH25	3,289.47	A-MH26	3,286.67	350.25	0.1828	16 inch	14.0	4.4338	4.2510
A-P26	A-MH26	3,286.67	A-MH27 (MMH	3,284.22	306.00	0.1891	16 inch	14.7	4.4372	4.2480
A-P27	A-MH27 (MMH6)	3,284.22	A-MH28	3,281.61	434.00	0.1955	16 inch	15.4	3.8456	3.6501
A-P28	A-MH28	3,281.61	A-MH29	3,279.43	376.00	0.1955	16 inch	15.5	3.7759	3.5804
A-P29	A-MH29	3,279.43	A-MH30	3,273.98	240.00	0.1955	12 inch	17.6	3.4698	3.2743
A-P30	A-MH30	3,273.98	A-MH31	3,271.60	280.00	0.1955	15 inch	15.3	3.8490	3.6535
A-P31	A-MH31	3,271.60	A-MH32	3,264.28	500.00	0.1955	12 inch	18.7	2.7860	2.5906
A-P32	A-MH32	3,264.28	A-MH33	3,260.51	475.00	0.1955	15 inch	15.9	3.7193	3.5239
A-P33	A-MH33	3,260.51	A-MH34	3,257.15	495.00	0.1955	15 inch	16.2	3.4396	3.2441
A-P34	A-MH34	3,257.15	A-MH35	3,253.84	460.00	0.1955	15 inch	16.5	3.5414	3.3459
A-P35	A-MH35	3,253.84	A-MH36	3,251.41	450.00	0.1955	15 inch	17.1	3.0679	2.8724
A-P36	A-MH36	3,251.41	A-MH37	3,248.62	450.00	0.1955	15 inch	16.5	3.2873	3.0918
A-P37	A-MH37	3,248.62	A-MH38	3,240.61	450.00	0.1955	12 inch	23.1	3.0720	2.8765
A-P38	A-MH38	3,240.61	A-MH39	3,240.10	422.00	0.1955	18 inch	19.4	2.3600	2.1646
A-P39	A-MH39	3,240.10	O-1	3,238.61	572.00	0.1955	18 inch	16.1	3.4649	3.2694

Scenario: Present Day- Peak Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
A-P1	A-MH1	3,511.25	ETL-MH12	3,497.23	234.00	0.123	8 inch	39.3	1.912	1.789
A-P2	A-MH2	3,514.63	A-MH1	3,511.25	260.00	0.112	8 inch	29.3	0.890	0.778
A-P3	A-MH3	3,517.88	A-MH2	3,514.63	250.00	0.098	8 inch	27.7	0.890	0.792
A-P4	A-MH4	3,521.13	A-MH3	3,517.88	250.00	0.084	8 inch	25.7	0.890	0.806
A-P5	A-MH5	3,524.25	A-MH4	3,521.13	240.00	0.070	8 inch	23.6	0.890	0.820
A-P6	A-MH6	3,527.63	A-MH5	3,524.25	260.00	0.056	8 inch	21.3	0.890	0.834
A-P7	A-MH7	3,530.88	A-MH6	3,527.63	250.00	0.042	8 inch	18.7	0.890	0.848
A-P8	A-MH8	3,534.13	A-MH7	3,530.88	250.00	0.028	8 inch	15.7	0.890	0.862
A-P9	A-MH9	3,537.38	A-MH8	3,534.13	250.00	0.014	8 inch	12.0	0.890	0.876
AET-P1	AET-MH2	3,394.14	AET-MH1	3,389.97	375.66	0.000	12 inch	28.0	2.426	2.426
AET-P2	AET-MH3	3,395.65	AET-MH2	3,394.14	354.33	0.000	12 inch	0.0	1.503	1.503
AET-P3	AET-MH4	3,396.55	AET-MH3	3,395.65	212.38	0.000	12 inch	0.0	1.499	1.499
AET-P4	AET-MH5	3,398.85	AET-MH4	3,396.55	308.40	0.000	12 inch	0.0	1.988	1.988
AET-P5	AET-MH6	3,399.03	WT-MH1	3,398.85	322.62	0.000	10 inch	0.0	0.334	0.334
AET-P6	AET-MH7	3,400.00	AET-MH6	3,399.03	325.00	0.000	10 inch	0.0	0.774	0.774
AET-P7	AET-MH8	3,400.50	AET-MH7	3,400.00	300.00	0.000	10 inch	0.0	0.578	0.578
AET-P8	AET-MH9	3,401.80	AET-MH8	3,400.50	300.00	0.000	10 inch	0.0	0.932	0.932
AET-P9	AET-MH10	3,402.70	AET-MH9	3,401.80	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P10	AET-MH11	3,403.60	AET-MH10	3,402.70	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P11	AET-MH12	3,404.50	AET-MH11	3,403.60	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P12	AET-MH13	3,405.40	AET-MH12	3,404.50	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P13	AET-MH14	3,406.30	AET-MH13	3,405.40	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P14	AET-MH15	3,407.20	AET-MH14	3,406.30	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P15	AET-MH16	3,409.30	AET-MH15	3,407.20	300.00	0.000	8 inch	0.0	0.653	0.653
AET-P16	AET-MH17	3,411.10	AET-MH16	3,409.30	300.20	0.000	8 inch	0.0	0.605	0.605
AET-P17	AET-MH18	3,413.85	AET-MH17	3,411.10	325.82	0.000	8 inch	0.0	0.717	0.717
AET-P18	AET-MH19	3,416.91	AET-MH18	3,413.85	314.18	0.000	8 inch	0.0	0.771	0.771
AET-P19	AET-MH20	3,418.96	AET-MH19	3,416.91	340.82	0.000	8 inch	0.0	0.606	0.606
AET-P20	AET-MH21	3,421.00	AET-MH20	3,418.96	339.18	0.000	8 inch	0.0	0.606	0.606
AET-P21	AET-MH22	3,423.67	AET-MH21	3,421.00	340.00	0.000	8 inch	0.0	0.692	0.692
AET-P23	AET-MH24	3,429.00	AET-MH23	3,426.35	337.49	0.000	8 inch	0.0	0.692	0.692
AET-P24	AET-MH25	3,431.39	AET-MH24	3,429.00	197.85	0.000	8 inch	0.0	0.858	0.858
AET-P25	AET-MH26	3,435.25	AET-MH25	3,431.39	319.12	0.000	8 inch	0.0	0.859	0.859
AETS-P1	AET-MH23	3,426.35	ETU-MH1	3,419.83	457.68	0.000	12 inch	16.0	2.748	2.748
AF-P1	AF-MH1	3,545.65	WS-MH21	3,540.55	500.00	0.000	12 inch	0.0	2.325	2.325
AF-P2	AF-MH2	3,553.04	AF-MH1	3,545.65	500.00	0.000	12 inch	0.0	2.799	2.799
AF-P3	AF-MH3	3,558.23	AF-MH2	3,553.23	500.00	0.000	12 inch	0.0	2.303	2.303
AF-P4	AF-MH4	3,562.35	AF-MH3	3,558.33	500.00	0.000	12 inch	0.0	2.065	2.065
AF-P5	AF-MH5	3,566.60	AF-MH4	3,562.35	500.00	0.000	12 inch	0.0	2.123	2.123
AF-P6	AF-MH6	3,570.39	AF-MH5	3,566.60	500.00	0.000	12 inch	0.0	2.005	2.005
AF-P7	AF-MH7	3,574.43	AF-MH6	3,570.39	500.00	0.000	12 inch	0.0	2.070	2.070
AF-P8	AF-MH8	3,579.87	AF-MH7	3,574.53	500.00	0.000	12 inch	0.0	2.380	2.380
AF-P9	AF-MH9	3,583.53	AF-MH8	3,579.97	500.00	0.000	12 inch	0.0	1.943	1.943
AF-P10	AF-MH10	3,587.09	AF-MH9	3,583.53	500.00	0.000	12 inch	0.0	1.943	1.943
AF-P11	AF-MH11	3,590.52	AF-MH10	3,587.09	483.57	0.000	12 inch	0.0	1.939	1.939
ALE-P1	ALE-MH1	3,436.22	ETL-MH38	3,435.05	132.00	0.000	8 inch	24.5	0.735	0.735
ALE-P2	ALE-MH2	3,436.88	ALE-MH1	3,436.22	69.00	0.000	8 inch	0.0	0.764	0.764
ALE-P3	ALE-MH3	3,439.18	ALE-MH2	3,436.88	250.00	0.000	8 inch	0.0	0.749	0.749
ALE-P4	ALE-MH4	3,440.86	ALE-MH3	3,439.18	250.00	0.000	8 inch	0.0	0.640	0.640
ALE-P5	ALE-MH5	3,442.43	ALE-MH4	3,440.86	250.00	0.000	8 inch	0.0	0.619	0.619
ALE-P6	ALE-MH6	3,444.26	ALE-MH5	3,442.43	250.00	0.000	8 inch	0.0	0.668	0.668

Scenario: Present Day- Peak Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
ALE-P7	ALE-MH7	3,445.58	ALE-MH6	3,444.26	250.00	0.000	8 inch	0.0	0.567	0.567
ALE-P8	ALE-MH8	3,447.50	ALE-MH7	3,445.58	250.00	0.000	8 inch	0.0	0.684	0.684
ALE-P9	ALE-MH9	3,448.09	ALE-MH8	3,447.50	148.00	0.000	8 inch	0.0	0.493	0.493
AT-P1	AT-MH1	3,371.75	WT-MH9	3,369.95	352.00	1.607	21 inch	35.8	7.323	5.716
AT-P2	AT-MH2	3,369.43	AT-MH3	3,367.19	576.17	1.870	21 inch	37.1	6.385	4.515
AT-P3	AT-MH3	3,367.19	AT-MH4	3,364.86	597.00	1.870	21 inch	37.0	6.397	4.527
AT-P4	AT-MH4	3,364.86	AT-MH5	3,362.55	593.00	1.870	21 inch	37.1	6.391	4.521
AT-P5	AT-MH5	3,362.55	AT-MH6	3,361.39	297.00	1.870	21 inch	37.0	6.400	4.530
AT-P6	AT-MH6	3,361.39	AT-MH7	3,359.36	520.00	1.870	21 inch	37.0	6.398	4.528
AT-P7	AT-MH7	3,359.36	AT-MH8	3,357.36	514.00	1.870	21 inch	37.1	6.388	4.518
AT-P8	AT-MH8	3,357.36	AT-MH9	3,355.35	516.00	1.870	21 inch	36.7	6.391	4.521
AT-P9	AT-MH9	3,355.35	AT-MH10	3,353.17	517.16	1.870	21 inch	36.7	6.649	4.779
AT-P10	AT-MH10	3,353.17	AT-MH11	3,349.90	504.44	2.056	21 inch	35.5	8.245	6.189
AT-P11	AT-MH11	3,349.90	AT-MH12	3,349.35	70.15	2.056	21 inch	34.7	9.067	7.012
AT-P12	AT-MH12	3,349.35	O-1	3,345.77	425.00	2.056	21 inch	34.4	9.399	7.343
AWTL-P7	AWTL-MH7	3,443.06	AWTL-MH8	3,441.16	520.00	0.000	8 inch	6.5	0.472	0.472
AWTL-P8	AWTL-MH8	3,441.16	AWTL-MH9	3,439.67	248.00	0.022	8 inch	15.6	0.605	0.584
AWTL-P9	AWTL-MH9	3,439.67	AWTL-MH10	3,438.17	250.00	0.043	8 inch	20.2	0.605	0.561
AWTL-P10	AWTL-MH10	3,438.17	AWTL-MH11	3,436.67	250.00	0.065	8 inch	23.9	0.605	0.540
AWTL-P11	AWTL-MH11	3,436.67	AWTL-MH12	3,435.17	250.00	0.087	8 inch	27.2	0.605	0.518
AWTL-P12	AWTL-MH12	3,435.17	AWTL-MH13	3,433.28	315.00	0.109	8 inch	29.9	0.605	0.496
AWTL-P13	AWTL-MH13	3,433.28	AWTL-MH14	3,431.68	267.00	0.126	8 inch	31.6	0.605	0.478
AWTL-P14	AWTL-MH14	3,431.68	AWTL-MH15	3,429.85	262.00	0.141	8 inch	33.1	0.653	0.511
AWTL-P15	AWTL-MH15	3,429.85	AWTL-MH16	3,428.02	262.00	0.156	8 inch	34.7	0.653	0.497
AWTL-P16	AWTL-MH16	3,428.02	AWTL-MH17	3,426.19	262.00	0.170	8 inch	36.3	0.653	0.483
AWTL-P17	AWTL-MH17	3,426.19	AWTL-MH18	3,424.20	267.00	0.184	8 inch	37.7	0.674	0.491
AWTL-P18	AWTL-MH18	3,424.20	AWTL-MH19	3,420.14	338.00	0.197	8 inch	39.0	0.856	0.659
AWTL-P19	AWTL-MH19	3,420.14	AWTL-MH20	3,417.64	208.00	0.210	8 inch	40.3	0.856	0.646
AWTL-P20	AWTL-MH20	3,417.64	AWTL-MH21	3,412.48	430.00	0.223	8 inch	41.5	0.856	0.633
AWTL-P21	AWTL-MH21	3,412.48	AWTL-MH22	3,408.97	255.00	0.235	8 inch	43.5	0.916	0.681
AWTL-P22	AWTL-MH22	3,408.97	AWTL-MH23	3,407.77	299.11	0.248	10 inch	36.4	0.897	0.649
AWTL-P23	AWTL-MH23	3,407.77	AWTL-MH24	3,406.37	350.00	0.260	10 inch	36.9	0.896	0.636
AWTL-P24	AWTL-MH24	3,406.37	AWTU-MH4	3,404.94	326.45	0.271	10 inch	36.8	0.937	0.666
AWTU-P1	AWTU-MH1	3,409.61	AWTU-MH2	3,407.39	240.00	0.022	12 inch	9.0	2.215	2.193
AWTU-P2	AWTU-MH2	3,407.39	AWTU-MH3	3,406.44	101.59	0.044	12 inch	11.7	2.227	2.183
AWTU-P3	AWTU-MH3	3,406.44	AWTU-MH4	3,404.94	84.04	0.065	12 inch	21.8	3.076	3.011
AWTU-P4	AWTU-MH4	3,404.94	AWTU-MH5	3,402.70	223.55	0.317	10 inch	37.1	1.417	1.100
AWTU-P5	AWTU-MH5	3,402.70	AWTU-MH6	3,398.70	400.00	0.328	10 inch	40.0	1.416	1.088
AWTU-P6	AWTU-MH6	3,398.70	AWTU-MH7 (M	3,397.10	400.00	0.339	10 inch	40.4	0.896	0.557
AWTU-P7	AWTU-MH7 (MM	3,397.10	AWTU-MH8	3,393.83	400.00	0.339	10 inch	52.7	1.280	0.941
AWTU-P8	AWTU-MH8	3,393.83	AWTU-MH9	3,391.87	265.75	1.281	15 inch	47.1	3.585	2.304
AWTU-P9	AWTU-MH9	3,391.87	AWTU-MH10	3,390.23	415.03	1.281	15 inch	47.1	2.624	1.343
AWTU-P10	AWTU-MH10	3,390.23	AET-MH1	3,389.97	14.76	1.281	15 inch	39.7	5.540	4.259
BUR-P1	AET-MH1	3,389.97	BUR-MH1	3,387.70	356.06	1.281	15 inch	45.1	3.333	2.052
BUR-P2	BUR-MH1	3,387.70	BUR-MH2	3,384.94	524.00	1.281	15 inch	45.1	3.030	1.749
BUR-P3	BUR-MH2	3,384.94	BUR-MH3	3,381.40	525.00	1.281	15 inch	43.6	3.428	2.147
BUR-P4	BUR-MH3	3,381.40	BUR-MH4	3,377.85	535.00	1.281	15 inch	55.2	3.401	2.120
BUR-P5	BUR-MH4	3,377.85	BUR-MH5	3,376.23	592.00	1.281	15 inch	50.0	2.184	0.903
BUR-P6	BUR-MH5	3,376.23	BUR-MH6	3,373.16	295.28	1.281	15 inch	41.2	4.257	2.976
BUR-P7	BUR-MH6	3,373.16	AT-MH1	3,371.75	220.40	1.281	15 inch	45.3	3.339	2.058
DT-P1	DT-MH1	3,473.50	DT-MH2	3,470.00	130.00	0.018	12 inch	9.3	3.778	3.760

Scenario: Present Day- Peak Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
DT-P2	DT-MH2	3,470.00	DT-MH3	3,468.93	357.70	0.037	12 inch	11.8	1.259	1.223
DT-P3	DT-MH3	3,468.93	DT-MH4	3,467.29	198.06	0.055	12 inch	12.8	2.095	2.040
DT-P4	DT-MH4	3,467.29	DT-MH5	3,466.50	96.22	0.073	12 inch	14.9	2.086	2.013
DT-P5	DT-MH5	3,466.50	DT-MH6	3,464.45	400.00	0.091	12 inch	16.4	1.648	1.557
DT-P6	DT-MH6	3,464.45	DT-MH7	3,461.40	405.00	0.110	12 inch	17.4	1.998	1.889
DT-P7	DT-MH7	3,461.40	DT-MH8	3,458.35	400.00	0.124	12 inch	18.4	2.011	1.886
DT-P8	DT-MH8	3,458.35	DT-MH9	3,452.93	400.00	0.137	12 inch	19.3	2.680	2.543
DT-P9	DT-MH9	3,452.93	DT-MH10	3,447.50	410.00	0.150	12 inch	20.6	2.650	2.500
DT-P10	DT-MH10	3,447.50	DT-MH11	3,445.60	400.00	0.162	12 inch	21.4	1.587	1.425
DT-P11	DT-MH11	3,445.60	HT-MH19	3,441.01	272.00	0.173	12 inch	28.5	2.991	2.818
ETL-P2	ETL-MH2	3,506.53	ETL-MH3	3,505.43	324.00	0.112	12 inch	20.6	1.342	1.230
ETL-P3	ETL-MH3	3,505.43	ETL-MH4	3,504.56	325.00	0.123	12 inch	22.2	1.191	1.068
ETL-P4	ETL-MH4	3,504.56	ETL-MH5	3,503.70	329.00	0.133	12 inch	22.9	1.177	1.044
ETL-P5	ETL-MH5	3,503.70	ETL-MH6	3,502.73	346.00	0.143	12 inch	23.6	1.219	1.077
ETL-P6	ETL-MH6	3,502.73	ETL-MH7	3,501.90	308.00	0.152	12 inch	24.4	1.195	1.043
ETL-P7	ETL-MH7	3,501.90	ETL-MH8	3,501.01	330.00	0.161	12 inch	25.1	1.196	1.035
ETL-P8	ETL-MH8	3,501.01	ETL-MH9	3,500.12	331.00	0.170	12 inch	25.4	1.194	1.024
ETL-P9	ETL-MH9	3,500.12	ETL-MH10	3,499.23	292.00	0.179	12 inch	26.1	1.271	1.092
ETL-P10	ETL-MH10	3,499.23	ETL-MH11	3,498.24	374.00	0.188	12 inch	26.8	1.185	0.997
ETL-P11	ETL-MH11	3,498.24	ETL-MH12	3,497.23	337.00	0.196	12 inch	29.5	1.261	1.064
ETL-P12	ETL-MH12	3,497.23	ETL-MH13	3,496.53	250.00	0.276	12 inch	32.6	1.218	0.943
ETL-P13	ETL-MH13	3,496.53	ETL-MH14	3,495.83	250.00	0.283	12 inch	32.5	1.218	0.935
ETL-P14	ETL-MH14	3,495.83	ETL-MH15	3,495.03	250.00	0.291	12 inch	30.1	1.303	1.012
ETL-P15	ETL-MH15	3,495.03	ETL-MH16	3,492.61	250.00	0.298	12 inch	28.3	2.265	1.967
ETL-P16	ETL-MH16	3,492.61	ETL-MH17	3,490.81	250.00	0.305	12 inch	28.6	1.954	1.648
ETL-P17	ETL-MH17	3,490.81	ETL-MH18	3,488.52	304.00	0.313	12 inch	32.0	1.998	1.686
ETL-P18	ETL-MH18	3,488.52	ETL-MH19	3,487.24	473.00	0.320	12 inch	35.1	1.198	0.878
ETL-P19	ETL-MH19	3,487.24	ETL-MH20	3,485.93	448.00	0.327	12 inch	32.4	1.245	0.918
ETL-P20	ETL-MH20	3,485.93	ETL-MH21	3,485.75	30.00	0.334	12 inch	33.2	1.784	1.450
ETL-P21	ETL-MH21	3,485.75	ETL-MH22	3,484.40	501.00	0.341	12 inch	36.3	1.195	0.854
ETL-P22	ETL-MH22	3,484.40	ETL-MH23	3,482.95	496.00	0.348	12 inch	33.5	1.245	0.897
ETL-P23	ETL-MH23	3,482.95	ETL-MH24	3,478.64	255.00	0.355	12 inch	30.9	2.994	2.639
ETL-P24	ETL-MH24	3,478.64	ETL-MH25	3,472.21	383.00	0.362	12 inch	31.2	2.983	2.622
ETL-P25	ETL-MH25	3,472.21	ETL-MH26	3,467.03	385.00	0.368	12 inch	32.0	2.671	2.303
ETL-P26	ETL-MH26	3,467.03	ETL-MH27	3,465.04	398.00	0.375	12 inch	32.5	1.628	1.253
ETL-P27	ETL-MH27	3,465.04	ETL-MH28	3,462.90	402.00	0.382	12 inch	33.5	1.680	1.298
ETL-P28	ETL-MH28	3,462.90	ETL-MH29	3,461.16	402.00	0.388	12 inch	34.7	1.515	1.126
ETL-P29	ETL-MH29	3,461.16	ETL-MH30	3,459.42	402.00	0.395	12 inch	35.0	1.515	1.120
ETL-P30	ETL-MH30	3,459.42	ETL-MH31	3,457.68	402.00	0.402	12 inch	35.3	1.515	1.113
ETL-P31	ETL-MH31	3,457.68	ETL-MH32	3,455.94	402.00	0.408	12 inch	35.5	1.515	1.107
ETL-P32	ETL-MH32	3,455.94	ETL-MH33	3,454.13	402.00	0.415	12 inch	34.5	1.545	1.130
ETL-P33	ETL-MH33	3,454.13	ETL-MH34	3,451.50	402.00	0.421	12 inch	33.8	1.862	1.441
ETL-P34	ETL-MH34	3,451.50	ETL-MH35	3,449.22	404.00	0.428	12 inch	34.0	1.730	1.302
ETL-P35	ETL-MH35	3,449.22	ETL-MH36 (M	3,444.25	404.00	0.434	12 inch	31.0	2.554	2.120
ETL-P36	ETL-MH36 (MMH	3,444.25	ETL-MH37	3,437.82	404.00	0.434	12 inch	30.1	2.905	2.471
ETL-P37	ETL-MH37	3,437.82	ETL-MH38	3,435.05	177.00	0.434	12 inch	30.2	2.880	2.446
ETL-P38	ETL-MH38	3,435.05	ETL-MH39	3,432.32	219.00	0.434	14 inch	25.3	3.878	3.444
ETL-P39	ETL-MH39	3,432.32	ETL-MH40	3,430.33	357.00	0.434	15 inch	26.5	3.117	2.683
ETL-P40	ETL-MH40	3,430.33	ETL-MH41	3,427.71	369.09	0.434	12 inch	32.5	2.102	1.668
ETL-P41	ETL-MH41	3,427.71	ETL-MH42	3,425.08	216.54	0.434	12 inch	30.5	2.749	2.315
ETL-P42	ETL-MH42	3,425.08	ETL-MH43	3,423.53	234.58	0.434	12 inch	32.8	2.028	1.594

Scenario: Present Day- Peak Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
ETL-P43	ETL-MH43	3,423.53	ETL-MH44	3,421.85	273.95	0.434	12 inch	33.1	1.953	1.519
ETL-P44	ETL-MH44	3,421.85	ETU-MH1	3,419.83	249.34	0.434	15 inch	24.3	3.758	3.324
ETL-WST-P1	WS-MH1	3,465.30	ETL-MH28	3,462.90	131.92	0.000	12 inch	17.3	3.106	3.106
ETL Overflow	ETL-Overflow	3,507.30	ETL-HTL MH	3,504.06	321.52	0.000	8 inch	0.0	0.784	0.784
ETLL1-P1	ETLL1-MH1	3,517.77	ETLL1-MH2	3,517.08	14.00	0.014	12 inch	7.3	5.112	5.098
ETLL1-P2	ETLL1-MH2	3,517.08	ETLL1-MH3	3,515.56	238.00	0.028	12 inch	9.5	1.840	1.812
ETLL1-P3	ETLL1-MH3	3,515.56	ETLL1-MH4	3,513.42	267.00	0.042	12 inch	11.2	2.061	2.019
ETLL1-P4	ETLL1-MH4	3,513.42	ETLL1-MH5	3,511.38	243.00	0.056	12 inch	13.0	2.110	2.054
ETLL1-P5	ETLL1-MH5	3,511.38	ETLL1-MH6	3,510.00	260.00	0.070	12 inch	14.3	1.678	1.608
ETLL1-P6	ETLL1-MH6	3,510.00	ETLL1-MH7	3,506.79	391.00	0.084	12 inch	15.3	2.086	2.002
ETLL1-P7	ETLL1-MH7	3,506.79	ETL-MH2	3,506.53	41.01	0.098	12 inch	17.7	1.833	1.735
ETLL2-P1	ETLL2-MH1	3,505.97	ETLL2-MH2	3,504.74	230.00	0.018	8 inch	15.0	0.571	0.553
ETLL2-P2	ETLL2-MH2	3,504.74	ETLL2-MH3	3,503.70	219.00	0.037	8 inch	20.4	0.538	0.502
ETLL2-P3	ETLL2-MH3	3,503.70	ETLL2-MH4	3,502.39	372.00	0.055	8 inch	25.2	0.463	0.409
ETLL2-P4	ETLL2-MH4	3,502.39	ETLL2-MH5	3,501.26	335.43	0.073	8 inch	28.7	0.453	0.380
ETLL2-P5	ETLL2-MH5	3,501.26	ETLL2-MH6	3,500.94	92.21	0.091	8 inch	30.2	0.460	0.369
ETLL2-P6	ETLL2-MH6	3,500.94	HTL-MH1	3,499.25	336.29	0.110	8 inch	29.3	0.554	0.444
ETU-P1	ETU-MH1	3,419.83	ETU-MH2	3,414.67	375.00	0.434	15 inch	22.9	4.897	4.463
ETU-P2	ETU-MH2	3,414.67	ETU-MH3	3,408.79	400.00	0.434	15 inch	22.7	5.062	4.628
ETU-P3	ETU-MH3	3,408.79	ETU-MH4	3,402.61	417.00	0.434	15 inch	22.7	5.082	4.648
ETU-P4	ETU-MH4	3,402.61	ETU-MH5	3,396.41	500.00	0.434	15 inch	23.1	4.649	4.215
ETU-P5	ETU-MH5	3,396.41	ETU-MH6	3,391.31	500.00	0.434	15 inch	23.6	4.216	3.782
ETU-P6	ETU-MH6	3,391.31	ETU-MH7	3,387.65	469.00	0.434	15 inch	24.4	3.688	3.254
ETU-P7	ETU-MH7	3,387.65	ETU-MH8	3,384.12	453.00	0.434	15 inch	24.4	3.685	3.251
ETU-P8	ETU-MH8	3,384.12	ETU-MH9	3,380.61	450.00	0.434	15 inch	24.4	3.687	3.253
ETU-P9	ETU-MH9	3,380.61	ETU-MH10	3,377.67	376.00	0.434	15 inch	24.4	3.692	3.258
ETU-P10	ETU-MH10	3,377.67	ETU-MH11	3,375.51	278.00	0.434	15 inch	24.4	3.680	3.246
ETU-P11	ETU-MH11	3,375.51	ETU-MH12	3,373.58	234.00	0.434	15 inch	24.2	3.792	3.357
ETU-P12	ETU-MH12	3,373.58	ETU-MH13	3,369.59	468.00	0.434	15 inch	24.1	3.855	3.421
ETU-P13	ETU-MH13	3,369.59	ETU-MH14	3,365.63	460.00	0.434	15 inch	24.1	3.874	3.440
ETU-P14	ETU-MH14	3,365.63	ETU-MH15	3,362.33	384.00	0.434	15 inch	24.1	3.870	3.436
ETU-P15	ETU-MH15	3,362.33	ETU-MH16	3,358.03	500.00	0.434	15 inch	24.1	3.872	3.438
ETU-P16	ETU-MH16	3,358.03	AT-MH10	3,353.17	507.00	0.434	15 inch	38.7	4.087	3.653
FT-P1	FT-MH1	3,528.89	FT-MH2	3,515.96	685.70	0.029	6 inch	25.0	0.498	0.469
FT-P2	FT-MH2	3,515.96	FT-MH3	3,513.60	103.35	0.057	6 inch	32.8	0.548	0.491
FT-P3	FT-MH3	3,513.60	FT-MH4	3,505.16	400.26	0.086	6 inch	39.1	0.527	0.441
FT-P4	FT-MH4	3,505.16	FT-MH5	3,501.77	198.49	0.115	6 inch	44.0	0.474	0.359
FT-P5	FT-MH5	3,501.77	FT-MH6	3,493.29	431.43	0.135	6 inch	40.5	0.508	0.373
FT-P6	FT-MH6	3,493.29	FT-MH7	3,491.78	123.03	0.155	8 inch	34.8	0.865	0.711
FT-P7	FT-MH7	3,491.78	FT-MH8	3,488.49	324.80	0.173	8 inch	36.8	0.786	0.613
FT-P8	FT-MH8	3,488.49	FT-MH9	3,486.90	187.01	0.191	8 inch	38.6	0.720	0.529
FT-P9	FT-MH9	3,486.90	FT-MH10	3,485.73	95.14	0.208	8 inch	40.3	0.866	0.658
FT-P10	FT-MH10	3,485.73	FT-MH11	3,483.51	159.12	0.225	8 inch	41.9	0.922	0.697
FT-P11	FT-MH11	3,483.51	FT-MH12	3,479.88	287.07	0.241	8 inch	43.4	0.878	0.637
FT-P12	FT-MH12	3,479.88	FT-MH13	3,477.96	234.58	0.257	8 inch	44.8	0.707	0.449
FT-P13	FT-MH13	3,477.96	FT-MH14	3,476.96	121.39	0.273	8 inch	46.1	0.709	0.436
FT-P14	FT-MH14	3,476.96	FT-MH15	3,475.46	147.64	0.288	8 inch	47.4	0.787	0.499
FT-P15	FT-MH15	3,475.46	FT-MH16	3,473.49	223.10	0.303	8 inch	51.3	0.734	0.431
FT-P16	FT-MH16	3,473.49	FT-MH17	3,473.36	26.25	0.318	8 inch	52.5	0.550	0.232
FT-P17	FT-MH17	3,473.36	FT-MH18	3,471.87	132.87	0.332	8 inch	51.0	0.827	0.495
FT-P18	FT-MH18	3,471.87	FT-MH19	3,470.34	159.12	0.347	8 inch	52.1	0.766	0.419

Scenario: Present Day- Peak Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
FT-P19	FT-MH19	3,470.34	FT-MH20	3,468.58	146.00	0.361	8 inch	53.1	0.857	0.497
FT-P20	FT-MH20	3,468.58	FT-MH21	3,467.28	132.87	0.375	8 inch	54.2	0.772	0.398
FT-P21	FT-MH21	3,467.28	FT-MH22	3,466.75	22.97	0.388	8 inch	55.2	1.186	0.798
FT-P22	FT-MH22	3,466.75	FT-MH23	3,465.00	229.66	0.402	8 inch	56.1	0.682	0.280
FT-P23	FT-MH23	3,465.00	FT-MH24	3,463.00	254.27	0.415	8 inch	59.5	0.693	0.278
FT-P24	FT-MH24	3,463.00	FT-MH25	3,461.56	242.78	0.428	8 inch	60.4	0.601	0.173
FT-P25	FT-MH25	3,461.56	FT-MH26	3,460.27	137.80	0.441	8 inch	58.9	0.756	0.314
FT-P26	FT-MH26	3,460.27	FT-MH27	3,457.57	300.20	0.454	8 inch	61.2	0.741	0.286
FT-P27	FT-MH27	3,457.57	FT-MH28	3,456.70	127.95	0.467	8 inch	62.1	0.644	0.177
FT-P28	FT-MH28	3,456.70	FT-MH29	3,455.27	131.23	0.480	8 inch	61.5	0.815	0.335
FT-P29	FT-MH29	3,455.27	FT-MH30	3,453.99	132.87	0.492	8 inch	62.3	0.767	0.274
FT-P30	FT-MH30	3,453.99	FT-MH31	3,452.98	113.19	0.505	8 inch	63.3	0.738	0.233
FT-P31	FT-MH31	3,452.98	FT-MH32	3,451.91	132.87	0.517	8 inch	64.1	0.701	0.184
FT-P32	FT-MH32	3,451.91	FT-MH33	3,450.48	118.11	0.529	8 inch	64.6	0.859	0.330
FT-P33	FT-MH33	3,450.48	FT-MH34	3,447.71	260.83	0.541	8 inch	65.4	0.805	0.263
FT-P34	FT-MH34	3,447.71	FT-MH35	3,445.71	175.52	0.553	8 inch	66.1	0.834	0.280
FT-P35	FT-MH35	3,445.71	FT-MH36	3,439.68	590.55	0.565	8 inch	69.2	0.789	0.224
FT-P36	FT-MH36	3,439.68	FT-MH37	3,438.55	155.84	0.577	8 inch	88.8	0.665	0.088
FT-P37	FT-MH37	3,438.55	FT-MH38	3,437.31	198.49	0.589	8 inch	114.0	0.617	0.028
FT-P38	FT-MH38	3,437.31	FT-MH39	3,435.34	398.62	0.601	8 inch	99.6	0.549	-0.052
FT-P39	FT-MH39	3,435.34	FT-MH40	3,435.03	44.29	0.612	8 inch	75.8	0.653	0.041
FT-P40	FT-MH40	3,435.03	FT-MH41	3,432.22	363.50	0.624	8 inch	72.6	0.687	0.063
FT-P41	FT-MH41	3,432.22	FT-MH42	3,425.00	533.14	0.635	8 inch	70.9	0.909	0.274
FT-P42	FT-MH42	3,425.00	FT-MH43	3,420.68	310.00	0.646	8 inch	71.5	0.922	0.275
FT-P43	FT-MH43	3,420.68	MT-MH30	3,416.50	300.00	0.658	8 inch	82.3	0.922	0.264
HT-P1	HT-MH1	3,486.66	HT-MH2	3,485.76	180.85	0.018	8 inch	14.3	0.551	0.533
HT-P2	HT-MH2	3,485.76	HT-MH3	3,483.95	220.05	0.037	8 inch	29.6	0.708	0.672
HT-P3	HT-MH3	3,483.95	HT-MH4	3,482.74	300.51	0.228	10 inch	34.8	0.899	0.670
HT-P4	HT-MH4	3,482.74	HT-MH5	3,481.04	427.38	0.239	10 inch	35.7	0.893	0.654
HT-P5	HT-MH5	3,481.04	HT-MH6	3,479.44	400.00	0.249	10 inch	36.4	0.896	0.647
HT-P6	HT-MH6	3,479.44	HT-MH7	3,478.18	314.75	0.259	10 inch	37.2	0.896	0.637
HT-P7	HT-MH7	3,478.18	HT-MH8	3,477.19	248.25	0.269	10 inch	37.9	0.894	0.625
HT-P8	HT-MH8	3,477.19	HT-MH9	3,476.21	243.00	0.279	10 inch	38.7	0.899	0.620
HT-P9	HT-MH9	3,476.21	HT-MH10	3,475.04	294.00	0.289	10 inch	37.3	0.893	0.605
HT-P10	HT-MH10	3,475.04	HT-MH11	3,469.72	484.00	0.298	10 inch	35.9	1.485	1.186
HT-P11	HT-MH11	3,469.72	HT-MH12	3,466.57	286.00	0.308	10 inch	36.5	1.486	1.178
HT-P12	HT-MH12	3,466.57	HT-MH13	3,462.94	330.00	0.317	10 inch	37.0	1.485	1.168
HT-P13	HT-MH13	3,462.94	HT-MH14	3,458.54	400.00	0.326	10 inch	37.6	1.485	1.159
HT-P14	HT-MH14	3,458.54	HT-MH15	3,455.06	317.00	0.336	10 inch	35.1	1.484	1.148
HT-P15	HT-MH15	3,455.06	HT-MH16	3,450.84	383.00	0.345	12 inch	30.5	2.417	2.072
HT-P16	HT-MH16	3,450.84	HT-MH17	3,446.65	381.00	0.354	12 inch	30.9	2.415	2.061
HT-P17	HT-MH17	3,446.65	HT-MH18	3,443.76	263.00	0.363	12 inch	31.3	2.414	2.051
HT-P18	HT-MH18	3,443.76	HT-MH19	3,441.01	250.00	0.371	12 inch	33.6	2.415	2.044
HT-P19	HT-MH19	3,441.01	HT-MH20	3,436.95	406.00	0.472	12 inch	35.8	2.303	1.830
HT-P20	HT-MH20	3,436.95	HT-MH21	3,432.95	400.00	0.481	12 inch	36.2	2.303	1.822
HT-P21	HT-MH21	3,432.95	HT-MH22	3,429.35	400.00	0.489	12 inch	36.5	2.184	1.696
HT-P22	HT-MH22	3,429.35	HT-MH23	3,428.00	149.55	0.496	12 inch	36.8	2.188	1.691
HT-P23	HT-MH23	3,428.00	HT-MH24	3,424.15	350.45	0.504	12 inch	37.1	2.413	1.909
HT-P24	HT-MH24	3,424.15	HT-MH25	3,420.85	300.00	0.512	12 inch	37.4	2.415	1.903
HT-P25	HT-MH25	3,420.85	HT-MH26	3,416.45	400.00	0.520	12 inch	37.7	2.415	1.895
HT-P26	HT-MH26	3,416.45	HT-MH27	3,412.05	400.00	0.528	12 inch	37.9	2.415	1.887

Scenario: Present Day- Peak Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
HT-P27	HT-MH27	3,412.05	HT-MH28	3,407.65	400.00	0.536	12 inch	38.2	2.415	1.879
HT-P28	HT-MH28	3,407.65	HT-MH29 (MM	3,403.25	399.41	0.543	12 inch	35.3	2.417	1.873
HT-P29	HT-MH29 (MMH	3,403.25	WT-MH1	3,397.50	400.59	0.543	12 inch	34.2	2.759	2.215
HTL-P1	HTL-MH1	3,499.25	ETL-HTL MH	3,497.40	34.45	0.124	10 inch	18.0	3.281	3.157
HTL-P2	HTL-MH2	3,495.17	HTL-MH3	3,494.83	359.25	0.137	10 inch	31.7	0.436	0.298
HTL-P3	HTL-MH3	3,494.83	HTL-MH4	3,494.51	39.37	0.150	10 inch	25.4	1.277	1.127
HTL-P4	HTL-MH4	3,494.51	HTL-MH5	3,492.76	175.30	0.162	10 inch	26.4	1.533	1.371
HTL-P5	HTL-MH5	3,492.76	HTL-MH6	3,490.59	167.10	0.173	10 inch	27.3	1.748	1.575
HTL-P6	HTL-MH6	3,490.59	HTL-MH7	3,486.92	282.60	0.185	10 inch	28.2	1.614	1.429
HTL-P7	HTL-MH7	3,486.92	HT-MH3	3,483.95	221.43	0.196	10 inch	31.5	1.640	1.444
HTL-PETL	ETL-HTL MH	3,497.40	HTL-MH2	3,495.17	58.75	0.124	10 inch	30.6	2.759	2.634
KT-P1	KT-MH1	3,424.42	KT-MH2	3,422.85	393.70	0.100	10 inch	24.7	0.894	0.794
KT-P2	KT-MH2	3,422.85	KT-MH3	3,415.85	350.00	0.173	10 inch	29.1	2.003	1.830
KT-P3	KT-MH3	3,415.85	KT-MH4	3,409.85	300.00	0.233	10 inch	33.1	2.003	1.770
KT-P4	KT-MH4	3,409.85	KT-MH5	3,404.45	300.00	0.288	10 inch	36.5	1.900	1.612
KT-P5	KT-MH5	3,404.45	KT-MH6	3,398.05	400.00	0.339	10 inch	42.0	1.791	1.452
KT-P6	KT-MH6	3,398.05	KT-MH7	3,397.25	200.00	0.387	10 inch	44.6	0.896	0.508
KT-P7	KT-MH7	3,397.25	KT-MH8	3,389.25	400.00	0.434	10 inch	44.4	2.003	1.569
KT-P8	KT-MH8	3,389.25	KT-MH9	3,386.05	400.00	0.479	10 inch	46.6	1.267	0.788
KT-P9	KT-MH9	3,386.05	KT-MH10	3,381.85	300.00	0.522	10 inch	48.7	1.675	1.153
KT-P10	KT-MH10	3,381.85	KT-MH11	3,376.25	400.00	0.564	10 inch	55.0	1.675	1.111
KT-P11	KT-MH11	3,376.25	KT-MH12 (MM	3,374.65	400.00	0.605	10 inch	55.9	0.896	0.290
KT-P12	KT-MH12 (MMH	3,374.65	AT-MH1	3,371.75	383.00	0.605	12 inch	48.8	2.004	1.398
MT-P4	MT-MH4	3,496.54	MT-MH5	3,491.45	268.00	0.029	12 inch	10.3	3.173	3.145
MT-P5	MT-MH5	3,491.45	MT-MH6	3,486.05	288.00	0.057	12 inch	13.5	3.153	3.096
MT-P6	MT-MH6	3,486.05	MT-MH7	3,481.28	247.00	0.086	12 inch	16.1	3.200	3.114
MT-P7	MT-MH7	3,481.28	MT-MH8	3,476.52	250.50	0.115	12 inch	18.0	3.174	3.059
MT-P8	MT-MH8	3,476.52	MT-MH9	3,471.69	256.50	0.135	12 inch	19.4	3.160	3.025
MT-P9	MT-MH9	3,471.69	MT-MH10	3,468.06	279.00	0.155	12 inch	20.7	2.626	2.472
MT-P10	MT-MH10	3,468.06	MT-MH11	3,464.34	286.00	0.173	12 inch	21.8	2.626	2.453
MT-P11	MT-MH11	3,464.34	MT-MH12	3,461.32	233.00	0.191	12 inch	22.9	2.621	2.431
MT-P12	MT-MH12	3,461.32	MT-MH13	3,457.85	266.50	0.208	12 inch	23.9	2.627	2.419
MT-P13	MT-MH13	3,457.85	MT-MH14	3,454.59	251.00	0.225	12 inch	24.8	2.624	2.399
MT-P14	MT-MH14	3,454.59	MT-MH15	3,450.87	286.00	0.241	12 inch	25.6	2.626	2.385
MT-P15	MT-MH15	3,450.87	MT-MH16	3,447.15	286.50	0.257	12 inch	26.5	2.624	2.366
MT-P16	MT-MH16	3,447.15	MT-MH17	3,445.15	250.00	0.273	12 inch	27.3	2.059	1.787
MT-P17	MT-MH17	3,445.15	MT-MH18	3,443.15	251.00	0.288	12 inch	28.0	2.055	1.767
MT-P18	MT-MH18	3,443.15	MT-MH19	3,441.15	249.50	0.303	12 inch	28.7	2.062	1.758
MT-P19	MT-MH19	3,441.15	MT-MH20	3,440.11	142.72	0.318	12 inch	29.4	1.966	1.648
MT-P20	MT-MH20	3,440.11	MT-MH21	3,435.97	298.56	0.332	12 inch	30.1	2.711	2.379
MT-P21	MT-MH21	3,435.97	MT-MH22	3,433.75	152.56	0.347	12 inch	30.7	2.778	2.431
MT-P22	MT-MH22	3,433.75	MT-MH23	3,432.28	106.63	0.361	12 inch	31.3	2.704	2.343
MT-P23	MT-MH23	3,432.28	MT-MH24	3,431.09	96.78	0.375	12 inch	31.9	2.549	2.174
MT-P24	MT-MH24	3,431.09	MT-MH25	3,429.39	152.56	0.388	12 inch	32.5	2.433	2.045
MT-P25	MT-MH25	3,429.39	MT-MH26	3,426.93	250.00	0.402	12 inch	33.1	2.284	1.882
MT-P26	MT-MH26	3,426.93	MT-MH27	3,424.35	260.00	0.415	12 inch	36.9	2.294	1.879
MT-P27	MT-MH27	3,424.35	MT-MH28	3,421.70	376.00	0.601	12 inch	40.6	1.933	1.332
MT-P28	MT-MH28	3,421.70	MT-MH29	3,419.68	288.00	0.612	12 inch	41.0	1.928	1.316
MT-P29	MT-MH29	3,419.68	MT-MH30	3,416.50	288.00	0.624	12 inch	51.5	2.420	1.796
MT-P30	MT-MH30	3,416.50	MT-MH31	3,414.52	449.00	1.076	12 inch	58.5	1.529	0.453
MT-P31	MT-MH31	3,414.52	MT-MH32	3,411.72	400.00	1.086	12 inch	55.2	1.926	0.841

Scenario: Present Day- Peak Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
MT-P32	MT-MH32	3,411.72	MT-MH33	3,408.92	399.40	1.095	12 inch	55.5	1.928	0.833
MT-P33	MT-MH33	3,408.92	MT-MH34	3,407.39	148.90	1.104	12 inch	55.7	2.334	1.230
MT-P34	MT-MH34	3,407.39	MT-MH35	3,402.29	581.00	1.114	12 inch	55.9	2.157	1.043
MT-P35	MT-MH35	3,402.29	MT-MH36 (MM	3,396.98	590.00	1.123	12 inch	53.5	2.184	1.061
MT-P36	MT-MH36 (MMH	3,396.98	AWTU-MH8	3,393.83	593.83	1.123	15 inch	43.5	3.041	1.918
OI-P1	OI-MH1	3,369.79	OT-MH2	3,366.65	585.00	0.000	15 inch	0.0	3.059	3.059
OI-P2	OT-MH2	3,366.65	OT-MH3	3,364.82	575.00	0.000	15 inch	0.0	2.355	2.355
OI-P3	OT-MH3	3,364.82	OT-MH-4	3,362.87	560.00	0.000	15 inch	0.0	2.464	2.464
OI-P4	OT-MH-4	3,362.87	OT-MH5	3,360.92	595.00	0.000	15 inch	0.0	2.390	2.390
OI-P5	OT-MH5	3,360.92	OT-MH-6	3,359.20	560.00	0.000	15 inch	0.0	2.314	2.314
OI-P6	OT-MH-6	3,359.20	OT-MH7	3,357.19	565.00	0.000	15 inch	0.0	2.490	2.490
OI-P7	OT-MH7	3,357.19	OT-MH8	3,355.37	610.00	0.000	15 inch	0.0	2.280	2.280
OI-P8	OT-MH8	3,355.37	OT-MH9	3,352.33	510.00	0.000	15 inch	0.0	3.223	3.223
OI-P9	OT-MH9	3,352.33	OT-MH10	3,351.49	510.00	0.000	15 inch	0.0	1.694	1.694
OI-P10	OT-MH10	3,351.49	O-1	3,345.77	425.00	0.000	15 inch	0.0	4.843	4.843
WM-P1	WTL-MH6	3,442.41	WM-MH1	3,439.24	272.00	0.173	10 inch	27.6	1.529	1.356
WM-P2	WM-MH1	3,439.24	WM-MH2	3,434.80	398.00	0.191	10 inch	29.1	1.496	1.305
WM-P3	WM-MH2	3,434.80	WM-MH3	3,432.84	340.00	0.208	10 inch	30.3	1.075	0.867
WM-P4	WM-MH3	3,432.84	WM-MH4	3,430.80	345.00	0.225	10 inch	31.8	1.089	0.864
WM-P5	WM-MH4	3,430.80	WM-MH5	3,429.88	170.00	0.241	10 inch	33.0	1.042	0.800
WM-P6	WM-MH5	3,429.88	WM-MH6	3,427.92	340.00	0.257	10 inch	33.8	1.075	0.818
WM-P7	WM-MH6	3,427.92	WM-MH7	3,425.96	340.00	0.273	10 inch	36.1	1.075	0.802
WM-P8	WM-MH7	3,425.96	MT-MH27	3,424.35	360.00	0.288	10 inch	43.2	0.947	0.659
WS-P1	WS-MH2	3,467.81	WS-MH1	3,465.30	233.41	0.000	12 inch	0.0	2.388	2.388
WS-P2	WS-MH3	3,470.30	WS-MH2	3,467.81	231.00	0.000	12 inch	0.0	2.391	2.391
WS-P3	WS-MH4	3,472.79	WS-MH3	3,470.30	249.00	0.000	12 inch	0.0	2.303	2.303
WS-P4	WS-MH5	3,475.28	WS-MH4	3,472.79	231.00	0.000	12 inch	0.0	2.391	2.391
WS-P5	WS-MH6	3,479.44	WS-MH5	3,475.38	249.00	0.000	12 inch	0.0	2.940	2.940
WS-P6	WS-MH7	3,482.03	WS-MH6	3,479.44	249.00	0.000	12 inch	0.0	2.348	2.348
WS-P7	WS-MH8	3,484.53	WS-MH7	3,482.03	249.94	0.000	12 inch	0.0	2.303	2.303
WS-P8	WS-MH9	3,487.48	WS-MH8	3,484.63	231.94	0.000	12 inch	0.0	2.552	2.552
WS-P9	WS-MH10	3,490.34	WS-MH9	3,487.48	249.94	0.000	12 inch	0.0	2.463	2.463
WS-P10	WS-MH11	3,492.22	WS-MH10	3,490.44	249.94	0.000	12 inch	0.0	1.943	1.943
WS-P11	WS-MH12	3,494.04	WS-MH11	3,492.22	249.94	0.000	12 inch	0.0	1.965	1.965
WS-P12	WS-MH13	3,495.96	WS-MH12	3,494.04	249.94	0.000	12 inch	0.0	2.018	2.018
WS-P13	WS-MH14	3,497.72	WS-MH13	3,495.96	231.94	0.000	12 inch	0.0	2.006	2.006
WS-P14	WS-MH15	3,499.54	WS-MH14	3,497.72	249.94	0.000	12 inch	0.0	1.965	1.965
WS-P15	WS-MH16	3,501.12	WS-MH15	3,499.54	231.94	0.000	12 inch	0.0	1.900	1.900
WS-P16	WS-MH17	3,502.96	WS-MH16	3,501.12	249.94	0.000	8 inch	0.0	0.670	0.670
WS-P17	WS-MH18	3,514.68	WS-MH17	3,503.66	500.00	0.000	12 inch	0.0	3.418	3.418
WS-P18	WS-MH19	3,525.66	WS-MH18	3,514.68	500.00	0.000	12 inch	0.0	3.412	3.412
WS-P19	WS-MH20	3,533.74	WS-MH19	3,525.76	500.00	0.000	12 inch	0.0	2.909	2.909
WSP20	WS-MH21	3,540.55	WS-MH20	3,533.74	424.40	0.000	12 inch	0.0	2.917	2.917
WT-OI-P	WT-OI-OVERFL	3,369.95	OI-MH1	3,369.79	30.00	0.000	15 inch	0.0	3.049	3.049
WT-P1	WT-MH1	3,397.50	WT-MH2	3,395.92	90.00	0.543	15 inch	25.0	5.532	4.988
WT-P2	WT-MH2	3,395.92	WT-MH3	3,394.02	189.24	0.543	15 inch	26.5	4.183	3.640
WT-P3	WT-MH3	3,394.02	WT-MH4	3,391.08	302.81	0.543	15 inch	26.6	4.114	3.570
WT-P4	WT-MH4	3,391.08	WT-MH5	3,386.23	500.00	0.543	15 inch	26.6	4.112	3.568
WT-P5	WT-MH5	3,386.23	WT-MH6	3,381.45	500.00	0.543	15 inch	26.7	4.082	3.539
WT-P6	WT-MH6	3,381.45	WT-MH7	3,376.63	500.00	0.543	15 inch	26.7	4.099	3.556
WT-P7	WT-MH7	3,376.63	WT-MH8	3,371.85	489.54	0.543	15 inch	26.6	4.125	3.582

Scenario: Present Day- Peak Flow

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
WT-P8	WT-MH8	3,371.85	WT-MH9	3,369.95	194.63	0.543	15 inch	41.7	4.125	3.582
WT-P9	WT-MH9	3,369.95	AT-MH2	3,369.43	30.00	1.870	15 inch	47.9	5.496	3.626
WTL-P1	WTL-MH1	3,454.00	WTL-MH2	3,451.00	160.00	0.029	8 inch	17.3	1.069	1.041
WTL-P2	WTL-MH2	3,451.00	WTL-MH3	3,445.71	500.00	0.057	8 inch	22.6	0.803	0.746
WTL-P3	WTL-MH3	3,445.71	WTL-MH4	3,443.94	167.32	0.086	8 inch	30.5	0.802	0.717
WTL-P4	WTL-MH4	3,443.94	WTL-MH5	3,443.19	270.67	0.115	8 inch	34.1	0.412	0.297
WTL-P5	WTL-MH5	3,443.19	WTL-MH6	3,442.41	129.59	0.135	8 inch	32.8	0.606	0.471
WTL-P6	WTL-MH7	3,443.06	WTL-MH6	3,442.41	121.39	0.029	8 inch	24.4	0.571	0.543

Appendix D:

Model Results: Average Flow for Future Conditions

Scenario: Build-Out- Average Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
A-P1	A-MH1	3,511.25	ETL-MH12	3,497.23	234.00	0.025	8 inch	45.4	1.912	1.886
A-P2	A-MH2	3,514.63	A-MH1	3,511.25	260.00	0.022	8 inch	12.9	0.890	0.868
A-P3	A-MH3	3,517.88	A-MH2	3,514.63	250.00	0.020	8 inch	12.2	0.890	0.871
A-P4	A-MH4	3,521.13	A-MH3	3,517.88	250.00	0.017	8 inch	11.3	0.890	0.874
A-P5	A-MH5	3,524.25	A-MH4	3,521.13	240.00	0.014	8 inch	10.4	0.890	0.876
A-P6	A-MH6	3,527.63	A-MH5	3,524.25	260.00	0.011	8 inch	9.4	0.890	0.879
A-P7	A-MH7	3,530.88	A-MH6	3,527.63	250.00	0.008	8 inch	8.3	0.890	0.882
A-P8	A-MH8	3,534.13	A-MH7	3,530.88	250.00	0.006	8 inch	6.9	0.890	0.885
A-P9	A-MH9	3,537.38	A-MH8	3,534.13	250.00	0.003	8 inch	5.3	0.890	0.888
AET-P1	AET-MH2	3,394.14	AET-MH1	3,389.97	375.66	0.000	12 inch	36.3	2.426	2.426
AET-P2	AET-MH3	3,395.65	AET-MH2	3,394.14	354.33	0.000	12 inch	0.0	1.503	1.503
AET-P3	AET-MH4	3,396.55	AET-MH3	3,395.65	212.38	0.000	12 inch	0.0	1.499	1.499
AET-P4	AET-MH5	3,398.85	AET-MH4	3,396.55	308.40	0.000	12 inch	0.0	1.988	1.988
AET-P5	AET-MH6	3,399.03	WT-MH1	3,398.85	322.62	0.000	10 inch	0.0	0.334	0.334
AET-P6	AET-MH7	3,400.00	AET-MH6	3,399.03	325.00	0.000	10 inch	0.0	0.774	0.774
AET-P7	AET-MH8	3,400.50	AET-MH7	3,400.00	300.00	0.000	10 inch	0.0	0.578	0.578
AET-P8	AET-MH9	3,401.80	AET-MH8	3,400.50	300.00	0.000	10 inch	0.0	0.932	0.932
AET-P9	AET-MH10	3,402.70	AET-MH9	3,401.80	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P10	AET-MH11	3,403.60	AET-MH10	3,402.70	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P11	AET-MH12	3,404.50	AET-MH11	3,403.60	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P12	AET-MH13	3,405.40	AET-MH12	3,404.50	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P13	AET-MH14	3,406.30	AET-MH13	3,405.40	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P14	AET-MH15	3,407.20	AET-MH14	3,406.30	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P15	AET-MH16	3,409.30	AET-MH15	3,407.20	300.00	0.000	8 inch	0.0	0.653	0.653
AET-P16	AET-MH17	3,411.10	AET-MH16	3,409.30	300.20	0.000	8 inch	0.0	0.605	0.605
AET-P17	AET-MH18	3,413.85	AET-MH17	3,411.10	325.82	0.000	8 inch	0.0	0.717	0.717
AET-P18	AET-MH19	3,416.91	AET-MH18	3,413.85	314.18	0.000	8 inch	0.0	0.771	0.771
AET-P19	AET-MH20	3,418.96	AET-MH19	3,416.91	340.82	0.000	8 inch	0.0	0.606	0.606
AET-P20	AET-MH21	3,421.00	AET-MH20	3,418.96	339.18	0.000	8 inch	0.0	0.606	0.606
AET-P21	AET-MH22	3,423.67	AET-MH21	3,421.00	340.00	0.000	8 inch	0.0	0.692	0.692
AET-P23	AET-MH24	3,429.00	AET-MH23	3,426.35	337.49	0.000	8 inch	66.8	0.692	0.692
AET-P24	AET-MH25	3,431.39	AET-MH24	3,429.00	197.85	0.000	8 inch	0.0	0.858	0.858
AET-P25	AET-MH26	3,435.25	AET-MH25	3,431.39	319.12	0.000	8 inch	0.0	0.859	0.859
AETS-P1	AET-MH23	3,426.35	ETU-MH1	3,419.83	457.68	0.000	12 inch	415.1	2.748	2.748
AF-P1	AF-MH1	3,545.65	WS-MH21	3,540.55	500.00	0.307	12 inch	49.1	2.325	2.018
AF-P2	AF-MH2	3,553.04	AF-MH1	3,545.65	500.00	0.307	12 inch	25.5	2.799	2.492
AF-P3	AF-MH3	3,558.23	AF-MH2	3,553.23	500.00	0.307	12 inch	26.6	2.303	1.996
AF-P4	AF-MH4	3,562.35	AF-MH3	3,558.33	500.00	0.307	12 inch	27.3	2.065	1.758
AF-P5	AF-MH5	3,566.60	AF-MH4	3,562.35	500.00	0.307	12 inch	27.1	2.123	1.816
AF-P6	AF-MH6	3,570.39	AF-MH5	3,566.60	500.00	0.307	12 inch	27.5	2.005	1.698
AF-P7	AF-MH7	3,574.43	AF-MH6	3,570.39	500.00	0.307	12 inch	27.3	2.070	1.763
AF-P8	AF-MH8	3,579.87	AF-MH7	3,574.53	500.00	0.307	12 inch	26.4	2.380	2.073
AF-P9	AF-MH9	3,583.53	AF-MH8	3,579.97	500.00	0.307	12 inch	27.7	1.943	1.636
AF-P10	AF-MH10	3,587.09	AF-MH9	3,583.53	500.00	0.307	12 inch	27.7	1.943	1.636
AF-P11	AF-MH11	3,590.52	AF-MH10	3,587.09	483.57	0.307	12 inch	27.7	1.939	1.632
ALE-P1	ALE-MH1	3,436.22	ETL-MH38	3,435.05	132.00	0.987	8 inch	1,622.9	0.735	-0.252
ALE-P2	ALE-MH2	3,436.88	ALE-MH1	3,436.22	69.00	0.987	8 inch	1,575.2	0.764	-0.223
ALE-P3	ALE-MH3	3,439.18	ALE-MH2	3,436.88	250.00	0.987	8 inch	1,465.0	0.749	-0.238
ALE-P4	ALE-MH4	3,440.86	ALE-MH3	3,439.18	250.00	0.987	8 inch	1,121.5	0.640	-0.347
ALE-P5	ALE-MH5	3,442.43	ALE-MH4	3,440.86	250.00	0.987	8 inch	1,042.7	0.619	-0.368
ALE-P6	ALE-MH6	3,444.26	ALE-MH5	3,442.43	250.00	0.987	8 inch	1,042.7	0.668	-0.319

Scenario: Build-Out- Average Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
ALE-P7	ALE-MH7	3,445.58	ALE-MH6	3,444.26	250.00	0.987	8 inch	1,046.5	0.567	-0.420
ALE-P8	ALE-MH8	3,447.50	ALE-MH7	3,445.58	250.00	0.987	8 inch	1,073.5	0.684	-0.303
ALE-P9	ALE-MH9	3,448.09	ALE-MH8	3,447.50	148.00	0.987	8 inch	1,153.1	0.493	-0.494
AT-P1	AT-MH1	3,371.75	WT-MH9	3,369.95	352.00	2.823	21 inch	48.6	7.323	4.500
AT-P2	AT-MH2	3,369.43	AT-MH3	3,367.19	576.17	3.447	21 inch	52.3	6.385	2.938
AT-P3	AT-MH3	3,367.19	AT-MH4	3,364.86	597.00	3.447	21 inch	52.5	6.397	2.951
AT-P4	AT-MH4	3,364.86	AT-MH5	3,362.55	593.00	3.496	21 inch	52.8	6.391	2.896
AT-P5	AT-MH5	3,362.55	AT-MH6	3,361.39	297.00	3.496	21 inch	52.7	6.400	2.904
AT-P6	AT-MH6	3,361.39	AT-MH7	3,359.36	520.00	3.496	21 inch	52.7	6.398	2.903
AT-P7	AT-MH7	3,359.36	AT-MH8	3,357.36	514.00	3.496	21 inch	52.8	6.388	2.892
AT-P8	AT-MH8	3,357.36	AT-MH9	3,355.35	516.00	3.496	21 inch	52.3	6.391	2.896
AT-P9	AT-MH9	3,355.35	AT-MH10	3,353.17	517.16	3.534	21 inch	70.4	6.649	3.115
AT-P10	AT-MH10	3,353.17	AT-MH11	3,349.90	504.44	8.744	21 inch	84.0	8.245	-0.499
AT-P11	AT-MH11	3,349.90	AT-MH12	3,349.35	70.15	8.744	21 inch	78.6	9.067	0.323
AT-P12	AT-MH12	3,349.35	O-1	3,345.77	425.00	8.744	21 inch	77.3	9.399	0.655
AWTL-P7	AWTL-MH7	3,443.06	AWTL-MH8	3,441.16	520.00	0.000	8 inch	3.0	0.472	0.472
AWTL-P8	AWTL-MH8	3,441.16	AWTL-MH9	3,439.67	248.00	0.004	8 inch	7.2	0.605	0.601
AWTL-P9	AWTL-MH9	3,439.67	AWTL-MH10	3,438.17	250.00	0.009	8 inch	9.3	0.605	0.596
AWTL-P10	AWTL-MH10	3,438.17	AWTL-MH11	3,436.67	250.00	0.013	8 inch	14.1	0.605	0.592
AWTL-P11	AWTL-MH11	3,436.67	AWTL-MH12	3,435.17	250.00	0.043	8 inch	18.5	0.605	0.562
AWTL-P12	AWTL-MH12	3,435.17	AWTL-MH13	3,433.28	315.00	0.047	8 inch	19.3	0.605	0.558
AWTL-P13	AWTL-MH13	3,433.28	AWTL-MH14	3,431.68	267.00	0.052	8 inch	32.8	0.605	0.553
AWTL-P14	AWTL-MH14	3,431.68	AWTL-MH15	3,429.85	262.00	0.276	8 inch	45.9	0.653	0.377
AWTL-P15	AWTL-MH15	3,429.85	AWTL-MH16	3,428.02	262.00	0.281	8 inch	46.3	0.653	0.372
AWTL-P16	AWTL-MH16	3,428.02	AWTL-MH17	3,426.19	262.00	0.285	8 inch	46.7	0.653	0.368
AWTL-P17	AWTL-MH17	3,426.19	AWTL-MH18	3,424.20	267.00	0.289	8 inch	59.6	0.674	0.385
AWTL-P18	AWTL-MH18	3,424.20	AWTL-MH19	3,420.14	338.00	0.665	8 inch	72.4	0.856	0.191
AWTL-P19	AWTL-MH19	3,420.14	AWTL-MH20	3,417.64	208.00	0.670	8 inch	72.6	0.856	0.187
AWTL-P20	AWTL-MH20	3,417.64	AWTL-MH21	3,412.48	430.00	0.674	8 inch	72.8	0.856	0.182
AWTL-P21	AWTL-MH21	3,412.48	AWTL-MH22	3,408.97	255.00	0.678	8 inch	77.3	0.916	0.238
AWTL-P22	AWTL-MH22	3,408.97	AWTL-MH23	3,407.77	299.11	0.683	10 inch	65.5	0.897	0.214
AWTL-P23	AWTL-MH23	3,407.77	AWTL-MH24	3,406.37	350.00	0.687	10 inch	64.8	0.896	0.209
AWTL-P24	AWTL-MH24	3,406.37	AWTU-MH4	3,404.94	326.45	0.691	10 inch	63.1	0.937	0.246
AWTU-P1	AWTU-MH1	3,409.61	AWTU-MH2	3,407.39	240.00	0.167	12 inch	21.1	2.215	2.047
AWTU-P2	AWTU-MH2	3,407.39	AWTU-MH3	3,406.44	101.59	0.172	12 inch	21.3	2.227	2.055
AWTU-P3	AWTU-MH3	3,406.44	AWTU-MH4	3,404.94	84.04	0.176	12 inch	36.7	3.076	2.900
AWTU-P4	AWTU-MH4	3,404.94	AWTU-MH5	3,402.70	223.55	0.872	10 inch	62.4	1.417	0.546
AWTU-P5	AWTU-MH5	3,402.70	AWTU-MH6	3,398.70	400.00	0.876	10 inch	72.5	1.416	0.540
AWTU-P6	AWTU-MH6	3,398.70	AWTU-MH7 (M	3,397.10	400.00	0.901	10 inch	76.8	0.896	-0.005
AWTU-P7	AWTU-MH7 (MM	3,397.10	AWTU-MH8	3,393.83	400.00	1.095	10 inch	79.1	1.280	0.185
AWTU-P8	AWTU-MH8	3,393.83	AWTU-MH9	3,391.87	265.75	2.094	15 inch	62.8	3.585	1.492
AWTU-P9	AWTU-MH9	3,391.87	AWTU-MH10	3,390.23	415.03	2.094	15 inch	62.8	2.624	0.531
AWTU-P10	AWTU-MH10	3,390.23	AET-MH1	3,389.97	14.76	2.094	15 inch	51.8	5.540	3.447
BUR-P1	AET-MH1	3,389.97	BUR-MH1	3,387.70	356.06	2.094	15 inch	59.6	3.333	1.240
BUR-P2	BUR-MH1	3,387.70	BUR-MH2	3,384.94	524.00	2.094	15 inch	59.6	3.030	0.936
BUR-P3	BUR-MH2	3,384.94	BUR-MH3	3,381.40	525.00	2.094	15 inch	57.2	3.428	1.335
BUR-P4	BUR-MH3	3,381.40	BUR-MH4	3,377.85	535.00	2.094	15 inch	73.4	3.401	1.307
BUR-P5	BUR-MH4	3,377.85	BUR-MH5	3,376.23	592.00	2.094	15 inch	68.2	2.184	0.090
BUR-P6	BUR-MH5	3,376.23	BUR-MH6	3,373.16	295.28	2.094	15 inch	53.8	4.257	2.163
BUR-P7	BUR-MH6	3,373.16	AT-MH1	3,371.75	220.40	2.094	15 inch	59.6	3.339	1.246
DT-P1	DT-MH1	3,473.50	DT-MH2	3,470.00	130.00	0.004	12 inch	4.2	3.778	3.774

Scenario: Build-Out- Average Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
DT-P2	DT-MH2	3,470.00	DT-MH3	3,468.93	357.70	0.007	12 inch	5.4	1.259	1.252
DT-P3	DT-MH3	3,468.93	DT-MH4	3,467.29	198.06	0.011	12 inch	6.9	2.095	2.084
DT-P4	DT-MH4	3,467.29	DT-MH5	3,466.50	96.22	0.028	12 inch	9.0	2.086	2.058
DT-P5	DT-MH5	3,466.50	DT-MH6	3,464.45	400.00	0.032	12 inch	9.6	1.648	1.617
DT-P6	DT-MH6	3,464.45	DT-MH7	3,461.40	405.00	0.035	12 inch	9.7	1.998	1.963
DT-P7	DT-MH7	3,461.40	DT-MH8	3,458.35	400.00	0.039	12 inch	10.2	2.011	1.972
DT-P8	DT-MH8	3,458.35	DT-MH9	3,452.93	400.00	0.043	12 inch	10.7	2.680	2.638
DT-P9	DT-MH9	3,452.93	DT-MH10	3,447.50	410.00	0.046	12 inch	11.5	2.650	2.603
DT-P10	DT-MH10	3,447.50	DT-MH11	3,445.60	400.00	0.050	12 inch	12.0	1.587	1.537
DT-P11	DT-MH11	3,445.60	HT-MH19	3,441.01	272.00	0.054	12 inch	25.2	2.991	2.937
ETL-P2	ETL-MH2	3,506.53	ETL-MH3	3,505.43	324.00	0.567	12 inch	47.1	1.342	0.775
ETL-P3	ETL-MH3	3,505.43	ETL-MH4	3,504.56	325.00	0.570	12 inch	49.3	1.191	0.621
ETL-P4	ETL-MH4	3,504.56	ETL-MH5	3,503.70	329.00	0.585	12 inch	49.4	1.177	0.592
ETL-P5	ETL-MH5	3,503.70	ETL-MH6	3,502.73	346.00	0.588	12 inch	49.6	1.219	0.631
ETL-P6	ETL-MH6	3,502.73	ETL-MH7	3,501.90	308.00	0.601	12 inch	50.2	1.195	0.595
ETL-P7	ETL-MH7	3,501.90	ETL-MH8	3,501.01	330.00	0.603	12 inch	50.4	1.196	0.592
ETL-P8	ETL-MH8	3,501.01	ETL-MH9	3,500.12	331.00	0.606	12 inch	49.6	1.194	0.588
ETL-P9	ETL-MH9	3,500.12	ETL-MH10	3,499.23	292.00	0.609	12 inch	49.9	1.271	0.662
ETL-P10	ETL-MH10	3,499.23	ETL-MH11	3,498.24	374.00	0.612	12 inch	50.1	1.185	0.573
ETL-P11	ETL-MH11	3,498.24	ETL-MH12	3,497.23	337.00	0.615	12 inch	50.5	1.261	0.646
ETL-P12	ETL-MH12	3,497.23	ETL-MH13	3,496.53	250.00	0.643	12 inch	51.7	1.218	0.576
ETL-P13	ETL-MH13	3,496.53	ETL-MH14	3,495.83	250.00	0.645	12 inch	50.8	1.218	0.573
ETL-P14	ETL-MH14	3,495.83	ETL-MH15	3,495.03	250.00	0.648	12 inch	46.0	1.303	0.654
ETL-P15	ETL-MH15	3,495.03	ETL-MH16	3,492.61	250.00	0.651	12 inch	39.4	2.265	1.614
ETL-P16	ETL-MH16	3,492.61	ETL-MH17	3,490.81	250.00	0.654	12 inch	41.0	1.954	1.300
ETL-P17	ETL-MH17	3,490.81	ETL-MH18	3,488.52	304.00	0.657	12 inch	52.9	1.998	1.342
ETL-P18	ETL-MH18	3,488.52	ETL-MH19	3,487.24	473.00	0.875	12 inch	62.7	1.198	0.323
ETL-P19	ETL-MH19	3,487.24	ETL-MH20	3,485.93	448.00	0.878	12 inch	55.8	1.245	0.367
ETL-P20	ETL-MH20	3,485.93	ETL-MH21	3,485.75	30.00	0.881	12 inch	56.8	1.784	0.903
ETL-P21	ETL-MH21	3,485.75	ETL-MH22	3,484.40	501.00	0.884	12 inch	63.2	1.195	0.312
ETL-P22	ETL-MH22	3,484.40	ETL-MH23	3,482.95	496.00	0.886	12 inch	57.4	1.245	0.359
ETL-P23	ETL-MH23	3,482.95	ETL-MH24	3,478.64	255.00	0.990	12 inch	46.1	2.994	2.003
ETL-P24	ETL-MH24	3,478.64	ETL-MH25	3,472.21	383.00	0.993	12 inch	55.2	2.983	1.990
ETL-P25	ETL-MH25	3,472.21	ETL-MH26	3,467.03	385.00	1.187	12 inch	224.5	2.671	1.483
ETL-P26	ETL-MH26	3,467.03	ETL-MH27	3,465.04	398.00	1.190	12 inch	437.6	1.628	0.438
ETL-P27	ETL-MH27	3,465.04	ETL-MH28	3,462.90	402.00	1.193	12 inch	537.0	1.680	0.487
ETL-P28	ETL-MH28	3,462.90	ETL-MH29	3,461.16	402.00	3.192	12 inch	1,003.3	1.515	-1.677
ETL-P29	ETL-MH29	3,461.16	ETL-MH30	3,459.42	402.00	3.195	12 inch	1,078.0	1.515	-1.680
ETL-P30	ETL-MH30	3,459.42	ETL-MH31	3,457.68	402.00	3.198	12 inch	1,252.7	1.515	-1.683
ETL-P31	ETL-MH31	3,457.68	ETL-MH32	3,455.94	402.00	3.200	12 inch	1,157.3	1.515	-1.686
ETL-P32	ETL-MH32	3,455.94	ETL-MH33	3,454.13	402.00	3.203	12 inch	1,125.5	1.545	-1.658
ETL-P33	ETL-MH33	3,454.13	ETL-MH34	3,451.50	402.00	3.206	12 inch	888.2	1.862	-1.344
ETL-P34	ETL-MH34	3,451.50	ETL-MH35	3,449.22	404.00	4.083	12 inch	1,359.2	1.730	-2.353
ETL-P35	ETL-MH35	3,449.22	ETL-MH36 (M	3,444.25	404.00	4.086	12 inch	1,102.6	2.554	-1.532
ETL-P36	ETL-MH36 (MMH	3,444.25	ETL-MH37	3,437.82	404.00	4.223	12 inch	1,176.0	2.905	-1.318
ETL-P37	ETL-MH37	3,437.82	ETL-MH38	3,435.05	177.00	4.223	12 inch	1,194.2	2.880	-1.343
ETL-P38	ETL-MH38	3,435.05	ETL-MH39	3,432.32	219.00	5.210	14 inch	975.3	3.878	-1.332
ETL-P39	ETL-MH39	3,432.32	ETL-MH40	3,430.33	357.00	5.210	15 inch	1,023.6	3.117	-2.093
ETL-P40	ETL-MH40	3,430.33	ETL-MH41	3,427.71	369.09	5.210	12 inch	1,837.1	2.102	-3.109
ETL-P41	ETL-MH41	3,427.71	ETL-MH42	3,425.08	216.54	5.210	12 inch	1,446.8	2.749	-2.461
ETL-P42	ETL-MH42	3,425.08	ETL-MH43	3,423.53	234.58	5.210	12 inch	1,376.2	2.028	-3.182

Scenario: Build-Out- Average Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
ETL-P43	ETL-MH43	3,423.53	ETL-MH44	3,421.85	273.95	5.210	12 inch	1,327.6	1.953	-3.257
ETL-P44	ETL-MH44	3,421.85	ETU-MH1	3,419.83	249.34	5.210	15 inch	667.4	3.758	-1.453
ETL-WST-P1	WS-MH1	3,465.30	ETL-MH28	3,462.90	131.92	1.996	12 inch	519.6	3.106	1.109
ETL Overflow	ETL-Overflow	3,507.30	ETL-HTL MH	3,504.06	321.52	0.000	8 inch	0.0	0.784	0.784
ETLL1-P1	ETLL1-MH1	3,517.77	ETLL1-MH2	3,517.08	14.00	0.547	12 inch	38.6	5.112	4.564
ETLL1-P2	ETLL1-MH2	3,517.08	ETLL1-MH3	3,515.56	238.00	0.550	12 inch	38.7	1.840	1.290
ETLL1-P3	ETLL1-MH3	3,515.56	ETLL1-MH4	3,513.42	267.00	0.553	12 inch	38.8	2.061	1.508
ETLL1-P4	ETLL1-MH4	3,513.42	ETLL1-MH5	3,511.38	243.00	0.556	12 inch	39.3	2.110	1.554
ETLL1-P5	ETLL1-MH5	3,511.38	ETLL1-MH6	3,510.00	260.00	0.559	12 inch	39.4	1.678	1.119
ETLL1-P6	ETLL1-MH6	3,510.00	ETLL1-MH7	3,506.79	391.00	0.561	12 inch	39.1	2.086	1.525
ETLL1-P7	ETLL1-MH7	3,506.79	ETL-MH2	3,506.53	41.01	0.564	12 inch	42.3	1.833	1.269
ETLL2-P1	ETLL2-MH1	3,505.97	ETLL2-MH2	3,504.74	230.00	0.306	8 inch	53.2	0.571	0.265
ETLL2-P2	ETLL2-MH2	3,504.74	ETLL2-MH3	3,503.70	219.00	0.310	8 inch	58.2	0.538	0.229
ETLL2-P3	ETLL2-MH3	3,503.70	ETLL2-MH4	3,502.39	372.00	0.326	8 inch	62.6	0.463	0.137
ETLL2-P4	ETLL2-MH4	3,502.39	ETLL2-MH5	3,501.26	335.43	0.330	8 inch	63.2	0.453	0.123
ETLL2-P5	ETLL2-MH5	3,501.26	ETLL2-MH6	3,500.94	92.21	0.334	8 inch	61.2	0.460	0.126
ETLL2-P6	ETLL2-MH6	3,500.94	HTL-MH1	3,499.25	336.29	0.365	8 inch	56.1	0.554	0.188
ETU-P1	ETU-MH1	3,419.83	ETU-MH2	3,414.67	375.00	5.210	15 inch	565.6	4.897	-0.313
ETU-P2	ETU-MH2	3,414.67	ETU-MH3	3,408.79	400.00	5.210	15 inch	534.8	5.062	-0.148
ETU-P3	ETU-MH3	3,408.79	ETU-MH4	3,402.61	417.00	5.210	15 inch	812.6	5.082	-0.128
ETU-P4	ETU-MH4	3,402.61	ETU-MH5	3,396.41	500.00	5.210	15 inch	863.5	4.649	-0.561
ETU-P5	ETU-MH5	3,396.41	ETU-MH6	3,391.31	500.00	5.210	15 inch	907.5	4.216	-0.994
ETU-P6	ETU-MH6	3,391.31	ETU-MH7	3,387.65	469.00	5.210	15 inch	733.8	3.688	-1.522
ETU-P7	ETU-MH7	3,387.65	ETU-MH8	3,384.12	453.00	5.210	15 inch	899.4	3.685	-1.525
ETU-P8	ETU-MH8	3,384.12	ETU-MH9	3,380.61	450.00	5.210	15 inch	963.1	3.687	-1.523
ETU-P9	ETU-MH9	3,380.61	ETU-MH10	3,377.67	376.00	5.210	15 inch	967.0	3.692	-1.519
ETU-P10	ETU-MH10	3,377.67	ETU-MH11	3,375.51	278.00	5.210	15 inch	1,014.0	3.680	-1.530
ETU-P11	ETU-MH11	3,375.51	ETU-MH12	3,373.58	234.00	5.210	15 inch	1,126.2	3.792	-1.419
ETU-P12	ETU-MH12	3,373.58	ETU-MH13	3,369.59	468.00	5.210	15 inch	1,076.8	3.855	-1.355
ETU-P13	ETU-MH13	3,369.59	ETU-MH14	3,365.63	460.00	5.210	15 inch	989.1	3.874	-1.337
ETU-P14	ETU-MH14	3,365.63	ETU-MH15	3,362.33	384.00	5.210	15 inch	753.7	3.870	-1.340
ETU-P15	ETU-MH15	3,362.33	ETU-MH16	3,358.03	500.00	5.210	15 inch	507.0	3.872	-1.339
ETU-P16	ETU-MH16	3,358.03	AT-MH10	3,353.17	507.00	5.210	15 inch	246.1	4.087	-1.123
FT-P1	FT-MH1	3,528.89	FT-MH2	3,515.96	685.70	0.043	6 inch	27.0	0.498	0.455
FT-P2	FT-MH2	3,515.96	FT-MH3	3,513.60	103.35	0.055	6 inch	29.4	0.548	0.493
FT-P3	FT-MH3	3,513.60	FT-MH4	3,505.16	400.26	0.060	6 inch	40.2	0.527	0.466
FT-P4	FT-MH4	3,505.16	FT-MH5	3,501.77	198.49	0.162	6 inch	51.3	0.474	0.312
FT-P5	FT-MH5	3,501.77	FT-MH6	3,493.29	431.43	0.174	6 inch	46.4	0.508	0.334
FT-P6	FT-MH6	3,493.29	FT-MH7	3,491.78	123.03	0.180	8 inch	36.9	0.865	0.685
FT-P7	FT-MH7	3,491.78	FT-MH8	3,488.49	324.80	0.186	8 inch	37.5	0.786	0.600
FT-P8	FT-MH8	3,488.49	FT-MH9	3,486.90	187.01	0.191	8 inch	38.1	0.720	0.529
FT-P9	FT-MH9	3,486.90	FT-MH10	3,485.73	95.14	0.197	8 inch	38.6	0.866	0.669
FT-P10	FT-MH10	3,485.73	FT-MH11	3,483.51	159.12	0.203	8 inch	39.2	0.922	0.720
FT-P11	FT-MH11	3,483.51	FT-MH12	3,479.88	287.07	0.208	8 inch	39.8	0.878	0.670
FT-P12	FT-MH12	3,479.88	FT-MH13	3,477.96	234.58	0.214	8 inch	40.3	0.707	0.492
FT-P13	FT-MH13	3,477.96	FT-MH14	3,476.96	121.39	0.220	8 inch	40.9	0.709	0.489
FT-P14	FT-MH14	3,476.96	FT-MH15	3,475.46	147.64	0.226	8 inch	41.5	0.787	0.562
FT-P15	FT-MH15	3,475.46	FT-MH16	3,473.49	223.10	0.231	8 inch	43.8	0.734	0.502
FT-P16	FT-MH16	3,473.49	FT-MH17	3,473.36	26.25	0.237	8 inch	44.4	0.550	0.312
FT-P17	FT-MH17	3,473.36	FT-MH18	3,471.87	132.87	0.243	8 inch	43.1	0.827	0.584
FT-P18	FT-MH18	3,471.87	FT-MH19	3,470.34	159.12	0.249	8 inch	44.0	0.766	0.517

Scenario: Build-Out- Average Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
FT-P19	FT-MH19	3,470.34	FT-MH20	3,468.58	146.00	0.264	8 inch	44.9	0.857	0.594
FT-P20	FT-MH20	3,468.58	FT-MH21	3,467.28	132.87	0.270	8 inch	45.4	0.772	0.503
FT-P21	FT-MH21	3,467.28	FT-MH22	3,466.75	22.97	0.275	8 inch	45.9	1.186	0.911
FT-P22	FT-MH22	3,466.75	FT-MH23	3,465.00	229.66	0.281	8 inch	46.4	0.682	0.401
FT-P23	FT-MH23	3,465.00	FT-MH24	3,463.00	254.27	0.287	8 inch	47.9	0.693	0.406
FT-P24	FT-MH24	3,463.00	FT-MH25	3,461.56	242.78	0.293	8 inch	48.4	0.601	0.309
FT-P25	FT-MH25	3,461.56	FT-MH26	3,460.27	137.80	0.299	8 inch	47.9	0.756	0.457
FT-P26	FT-MH26	3,460.27	FT-MH27	3,457.57	300.20	0.304	8 inch	48.5	0.741	0.436
FT-P27	FT-MH27	3,457.57	FT-MH28	3,456.70	127.95	0.310	8 inch	48.9	0.644	0.334
FT-P28	FT-MH28	3,456.70	FT-MH29	3,455.27	131.23	0.316	8 inch	49.3	0.815	0.499
FT-P29	FT-MH29	3,455.27	FT-MH30	3,453.99	132.87	0.322	8 inch	49.7	0.767	0.445
FT-P30	FT-MH30	3,453.99	FT-MH31	3,452.98	113.19	0.327	8 inch	50.2	0.738	0.410
FT-P31	FT-MH31	3,452.98	FT-MH32	3,451.91	132.87	0.333	8 inch	50.7	0.701	0.368
FT-P32	FT-MH32	3,451.91	FT-MH33	3,450.48	118.11	0.339	8 inch	51.1	0.859	0.521
FT-P33	FT-MH33	3,450.48	FT-MH34	3,447.71	260.83	0.345	8 inch	51.6	0.805	0.460
FT-P34	FT-MH34	3,447.71	FT-MH35	3,445.71	175.52	0.350	8 inch	52.0	0.834	0.483
FT-P35	FT-MH35	3,445.71	FT-MH36	3,439.68	590.55	0.356	8 inch	52.5	0.789	0.433
FT-P36	FT-MH36	3,439.68	FT-MH37	3,438.55	155.84	0.362	8 inch	54.1	0.665	0.303
FT-P37	FT-MH37	3,438.55	FT-MH38	3,437.31	198.49	0.367	8 inch	58.0	0.617	0.250
FT-P38	FT-MH38	3,437.31	FT-MH39	3,435.34	398.62	0.373	8 inch	57.6	0.549	0.176
FT-P39	FT-MH39	3,435.34	FT-MH40	3,435.03	44.29	0.379	8 inch	54.5	0.653	0.274
FT-P40	FT-MH40	3,435.03	FT-MH41	3,432.22	363.50	0.385	8 inch	54.6	0.687	0.302
FT-P41	FT-MH41	3,432.22	FT-MH42	3,425.00	533.14	0.390	8 inch	55.0	0.909	0.518
FT-P42	FT-MH42	3,425.00	FT-MH43	3,420.68	310.00	0.396	8 inch	55.4	0.922	0.526
FT-P43	FT-MH43	3,420.68	MT-MH30	3,416.50	300.00	0.402	8 inch	70.6	0.922	0.520
HT-P1	HT-MH1	3,486.66	HT-MH2	3,485.76	180.85	0.004	8 inch	6.5	0.551	0.547
HT-P2	HT-MH2	3,485.76	HT-MH3	3,483.95	220.05	0.007	8 inch	33.1	0.708	0.701
HT-P3	HT-MH3	3,483.95	HT-MH4	3,482.74	300.51	0.406	10 inch	47.4	0.899	0.492
HT-P4	HT-MH4	3,482.74	HT-MH5	3,481.04	427.38	0.410	10 inch	47.7	0.893	0.483
HT-P5	HT-MH5	3,481.04	HT-MH6	3,479.44	400.00	0.414	10 inch	47.9	0.896	0.482
HT-P6	HT-MH6	3,479.44	HT-MH7	3,478.18	314.75	0.417	10 inch	48.3	0.896	0.478
HT-P7	HT-MH7	3,478.18	HT-MH8	3,477.19	248.25	0.427	10 inch	48.7	0.894	0.467
HT-P8	HT-MH8	3,477.19	HT-MH9	3,476.21	243.00	0.430	10 inch	49.0	0.899	0.469
HT-P9	HT-MH9	3,476.21	HT-MH10	3,475.04	294.00	0.434	10 inch	46.3	0.893	0.459
HT-P10	HT-MH10	3,475.04	HT-MH11	3,469.72	484.00	0.438	10 inch	43.6	1.485	1.047
HT-P11	HT-MH11	3,469.72	HT-MH12	3,466.57	286.00	0.441	10 inch	43.8	1.486	1.045
HT-P12	HT-MH12	3,466.57	HT-MH13	3,462.94	330.00	0.445	10 inch	44.0	1.485	1.040
HT-P13	HT-MH13	3,462.94	HT-MH14	3,458.54	400.00	0.449	10 inch	44.2	1.485	1.036
HT-P14	HT-MH14	3,458.54	HT-MH15	3,455.06	317.00	0.452	10 inch	41.1	1.484	1.031
HT-P15	HT-MH15	3,455.06	HT-MH16	3,450.84	383.00	0.481	12 inch	36.1	2.417	1.936
HT-P16	HT-MH16	3,450.84	HT-MH17	3,446.65	381.00	0.484	12 inch	36.2	2.415	1.930
HT-P17	HT-MH17	3,446.65	HT-MH18	3,443.76	263.00	0.488	12 inch	36.4	2.414	1.926
HT-P18	HT-MH18	3,443.76	HT-MH19	3,441.01	250.00	0.492	12 inch	37.5	2.415	1.923
HT-P19	HT-MH19	3,441.01	HT-MH20	3,436.95	406.00	0.549	12 inch	38.6	2.303	1.754
HT-P20	HT-MH20	3,436.95	HT-MH21	3,432.95	400.00	0.553	12 inch	39.4	2.303	1.750
HT-P21	HT-MH21	3,432.95	HT-MH22	3,429.35	400.00	0.592	12 inch	40.2	2.184	1.592
HT-P22	HT-MH22	3,429.35	HT-MH23	3,428.00	149.55	0.596	12 inch	40.3	2.188	1.592
HT-P23	HT-MH23	3,428.00	HT-MH24	3,424.15	350.45	0.600	12 inch	40.4	2.413	1.814
HT-P24	HT-MH24	3,424.15	HT-MH25	3,420.85	300.00	0.603	12 inch	40.6	2.415	1.812
HT-P25	HT-MH25	3,420.85	HT-MH26	3,416.45	400.00	0.607	12 inch	40.7	2.415	1.808
HT-P26	HT-MH26	3,416.45	HT-MH27	3,412.05	400.00	0.611	12 inch	40.9	2.415	1.804

Scenario: Build-Out- Average Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
HT-P27	HT-MH27	3,412.05	HT-MH28	3,407.65	400.00	0.620	12 inch	41.1	2.415	1.795
HT-P28	HT-MH28	3,407.65	HT-MH29 (MM	3,403.25	399.41	0.624	12 inch	37.9	2.417	1.793
HT-P29	HT-MH29 (MMH	3,403.25	WT-MH1	3,397.50	400.59	0.624	12 inch	36.8	2.759	2.135
HTL-P1	HTL-MH1	3,499.25	ETL-HTL MH	3,497.40	34.45	0.369	10 inch	31.2	3.281	2.912
HTL-P2	HTL-MH2	3,495.17	HTL-MH3	3,494.83	359.25	0.373	10 inch	55.0	0.436	0.063
HTL-P3	HTL-MH3	3,494.83	HTL-MH4	3,494.51	39.37	0.376	10 inch	40.3	1.277	0.900
HTL-P4	HTL-MH4	3,494.51	HTL-MH5	3,492.76	175.30	0.380	10 inch	40.5	1.533	1.153
HTL-P5	HTL-MH5	3,492.76	HTL-MH6	3,490.59	167.10	0.384	10 inch	40.7	1.748	1.364
HTL-P6	HTL-MH6	3,490.59	HTL-MH7	3,486.92	282.60	0.387	10 inch	40.9	1.614	1.226
HTL-P7	HTL-MH7	3,486.92	HT-MH3	3,483.95	221.43	0.391	10 inch	44.1	1.640	1.249
HTL-PETL	ETL-HTL MH	3,497.40	HTL-MH2	3,495.17	58.75	0.369	10 inch	54.8	2.759	2.390
KT-P1	KT-MH1	3,424.42	KT-MH2	3,422.85	393.70	0.308	10 inch	38.9	0.894	0.586
KT-P2	KT-MH2	3,422.85	KT-MH3	3,415.85	350.00	0.328	10 inch	38.0	2.003	1.675
KT-P3	KT-MH3	3,415.85	KT-MH4	3,409.85	300.00	0.348	10 inch	39.5	2.003	1.655
KT-P4	KT-MH4	3,409.85	KT-MH5	3,404.45	300.00	0.383	10 inch	41.1	1.900	1.517
KT-P5	KT-MH5	3,404.45	KT-MH6	3,398.05	400.00	0.403	10 inch	45.0	1.791	1.388
KT-P6	KT-MH6	3,398.05	KT-MH7	3,397.25	200.00	0.423	10 inch	46.1	0.896	0.473
KT-P7	KT-MH7	3,397.25	KT-MH8	3,389.25	400.00	0.443	10 inch	44.3	2.003	1.560
KT-P8	KT-MH8	3,389.25	KT-MH9	3,386.05	400.00	0.463	10 inch	45.8	1.267	0.804
KT-P9	KT-MH9	3,386.05	KT-MH10	3,381.85	300.00	0.505	10 inch	47.3	1.675	1.170
KT-P10	KT-MH10	3,381.85	KT-MH11	3,376.25	400.00	0.525	10 inch	58.2	1.675	1.150
KT-P11	KT-MH11	3,376.25	KT-MH12 (MM	3,374.65	400.00	0.729	10 inch	62.7	0.896	0.166
KT-P12	KT-MH12 (MMH	3,374.65	AT-MH1	3,371.75	383.00	0.729	12 inch	60.6	2.004	1.274
MT-P4	MT-MH4	3,496.54	MT-MH5	3,491.45	268.00	0.017	12 inch	9.9	3.173	3.157
MT-P5	MT-MH5	3,491.45	MT-MH6	3,486.05	288.00	0.070	12 inch	13.7	3.153	3.083
MT-P6	MT-MH6	3,486.05	MT-MH7	3,481.28	247.00	0.076	12 inch	14.2	3.200	3.124
MT-P7	MT-MH7	3,481.28	MT-MH8	3,476.52	250.50	0.081	12 inch	14.7	3.174	3.093
MT-P8	MT-MH8	3,476.52	MT-MH9	3,471.69	256.50	0.087	12 inch	15.2	3.160	3.073
MT-P9	MT-MH9	3,471.69	MT-MH10	3,468.06	279.00	0.093	12 inch	16.2	2.626	2.534
MT-P10	MT-MH10	3,468.06	MT-MH11	3,464.34	286.00	0.110	12 inch	17.2	2.626	2.516
MT-P11	MT-MH11	3,464.34	MT-MH12	3,461.32	233.00	0.116	12 inch	17.6	2.621	2.505
MT-P12	MT-MH12	3,461.32	MT-MH13	3,457.85	266.50	0.122	12 inch	18.0	2.627	2.506
MT-P13	MT-MH13	3,457.85	MT-MH14	3,454.59	251.00	0.128	12 inch	18.5	2.624	2.496
MT-P14	MT-MH14	3,454.59	MT-MH15	3,450.87	286.00	0.136	12 inch	19.0	2.626	2.490
MT-P15	MT-MH15	3,450.87	MT-MH16	3,447.15	286.50	0.142	12 inch	19.4	2.624	2.482
MT-P16	MT-MH16	3,447.15	MT-MH17	3,445.15	250.00	0.148	12 inch	19.8	2.059	1.912
MT-P17	MT-MH17	3,445.15	MT-MH18	3,443.15	251.00	0.154	12 inch	20.2	2.055	1.902
MT-P18	MT-MH18	3,443.15	MT-MH19	3,441.15	249.50	0.159	12 inch	20.6	2.062	1.902
MT-P19	MT-MH19	3,441.15	MT-MH20	3,440.11	142.72	0.165	12 inch	20.9	1.966	1.801
MT-P20	MT-MH20	3,440.11	MT-MH21	3,435.97	298.56	0.171	12 inch	21.3	2.711	2.541
MT-P21	MT-MH21	3,435.97	MT-MH22	3,433.75	152.56	0.176	12 inch	21.7	2.778	2.601
MT-P22	MT-MH22	3,433.75	MT-MH23	3,432.28	106.63	0.182	12 inch	22.0	2.704	2.521
MT-P23	MT-MH23	3,432.28	MT-MH24	3,431.09	96.78	0.188	12 inch	22.4	2.549	2.361
MT-P24	MT-MH24	3,431.09	MT-MH25	3,429.39	152.56	0.194	12 inch	22.8	2.433	2.240
MT-P25	MT-MH25	3,429.39	MT-MH26	3,426.93	250.00	0.201	12 inch	23.2	2.284	2.083
MT-P26	MT-MH26	3,426.93	MT-MH27	3,424.35	260.00	0.207	12 inch	30.6	2.294	2.087
MT-P27	MT-MH27	3,424.35	MT-MH28	3,421.70	376.00	0.530	12 inch	38.0	1.933	1.403
MT-P28	MT-MH28	3,421.70	MT-MH29	3,419.68	288.00	0.536	12 inch	38.2	1.928	1.392
MT-P29	MT-MH29	3,419.68	MT-MH30	3,416.50	288.00	0.542	12 inch	47.7	2.420	1.878
MT-P30	MT-MH30	3,416.50	MT-MH31	3,414.52	449.00	0.949	12 inch	54.3	1.529	0.580
MT-P31	MT-MH31	3,414.52	MT-MH32	3,411.72	400.00	0.955	12 inch	51.6	1.926	0.972

Scenario: Build-Out- Average Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
MT-P32	MT-MH32	3,411.72	MT-MH33	3,408.92	399.40	0.961	12 inch	51.8	1.928	0.967
MT-P33	MT-MH33	3,408.92	MT-MH34	3,407.39	148.90	0.966	12 inch	51.9	2.334	1.368
MT-P34	MT-MH34	3,407.39	MT-MH35	3,402.29	581.00	0.972	12 inch	52.1	2.157	1.185
MT-P35	MT-MH35	3,402.29	MT-MH36 (MM	3,396.98	590.00	0.978	12 inch	49.5	2.184	1.207
MT-P36	MT-MH36 (MMH	3,396.98	AWTU-MH8	3,393.83	593.83	0.998	15 inch	48.7	3.041	2.042
OI-P1	OI-MH1	3,369.79	OT-MH2	3,366.65	585.00	0.000	15 inch	0.0	3.059	3.059
OI-P2	OT-MH2	3,366.65	OT-MH3	3,364.82	575.00	0.000	15 inch	0.0	2.355	2.355
OI-P3	OT-MH3	3,364.82	OT-MH-4	3,362.87	560.00	0.000	15 inch	0.0	2.464	2.464
OI-P4	OT-MH-4	3,362.87	OT-MH5	3,360.92	595.00	0.000	15 inch	0.0	2.390	2.390
OI-P5	OT-MH5	3,360.92	OT-MH-6	3,359.20	560.00	0.000	15 inch	0.0	2.314	2.314
OI-P6	OT-MH-6	3,359.20	OT-MH7	3,357.19	565.00	0.000	15 inch	0.0	2.490	2.490
OI-P7	OT-MH7	3,357.19	OT-MH8	3,355.37	610.00	0.000	15 inch	0.0	2.280	2.280
OI-P8	OT-MH8	3,355.37	OT-MH9	3,352.33	510.00	0.000	15 inch	0.0	3.223	3.223
OI-P9	OT-MH9	3,352.33	OT-MH10	3,351.49	510.00	0.000	15 inch	0.0	1.694	1.694
OI-P10	OT-MH10	3,351.49	O-1	3,345.77	425.00	0.000	15 inch	0.0	4.843	4.843
WM-P1	WTL-MH6	3,442.41	WM-MH1	3,439.24	272.00	0.236	10 inch	31.7	1.529	1.293
WM-P2	WM-MH1	3,439.24	WM-MH2	3,434.80	398.00	0.241	10 inch	32.3	1.496	1.254
WM-P3	WM-MH2	3,434.80	WM-MH3	3,432.84	340.00	0.247	10 inch	32.7	1.075	0.828
WM-P4	WM-MH3	3,432.84	WM-MH4	3,430.80	345.00	0.253	10 inch	33.4	1.089	0.836
WM-P5	WM-MH4	3,430.80	WM-MH5	3,429.88	170.00	0.259	10 inch	33.9	1.042	0.783
WM-P6	WM-MH5	3,429.88	WM-MH6	3,427.92	340.00	0.264	10 inch	34.0	1.075	0.811
WM-P7	WM-MH6	3,427.92	WM-MH7	3,425.96	340.00	0.270	10 inch	35.6	1.075	0.805
WM-P8	WM-MH7	3,425.96	MT-MH27	3,424.35	360.00	0.276	10 inch	41.2	0.947	0.671
WS-P1	WS-MH2	3,467.81	WS-MH1	3,465.30	233.41	1.996	12 inch	411.4	2.388	0.391
WS-P2	WS-MH3	3,470.30	WS-MH2	3,467.81	231.00	1.996	12 inch	335.9	2.391	0.394
WS-P3	WS-MH4	3,472.79	WS-MH3	3,470.30	249.00	1.996	12 inch	267.3	2.303	0.306
WS-P4	WS-MH5	3,475.28	WS-MH4	3,472.79	231.00	1.996	12 inch	198.7	2.391	0.394
WS-P5	WS-MH6	3,479.44	WS-MH5	3,475.38	249.00	1.996	12 inch	113.2	2.940	0.944
WS-P6	WS-MH7	3,482.03	WS-MH6	3,479.44	249.00	1.996	12 inch	73.1	2.348	0.352
WS-P7	WS-MH8	3,484.53	WS-MH7	3,482.03	249.94	1.706	12 inch	72.5	2.303	0.597
WS-P8	WS-MH9	3,487.48	WS-MH8	3,484.63	231.94	1.706	12 inch	64.7	2.552	0.847
WS-P9	WS-MH10	3,490.34	WS-MH9	3,487.48	249.94	1.706	12 inch	65.4	2.463	0.758
WS-P10	WS-MH11	3,492.22	WS-MH10	3,490.44	249.94	1.706	12 inch	71.1	1.943	0.238
WS-P11	WS-MH12	3,494.04	WS-MH11	3,492.22	249.94	1.706	12 inch	72.3	1.965	0.259
WS-P12	WS-MH13	3,495.96	WS-MH12	3,494.04	249.94	1.706	12 inch	71.3	2.018	0.313
WS-P13	WS-MH14	3,497.72	WS-MH13	3,495.96	231.94	1.706	12 inch	70.7	2.006	0.300
WS-P14	WS-MH15	3,499.54	WS-MH14	3,497.72	249.94	1.706	12 inch	71.4	1.965	0.259
WS-P15	WS-MH16	3,501.12	WS-MH15	3,499.54	231.94	1.706	12 inch	73.0	1.900	0.195
WS-P16	WS-MH17	3,502.96	WS-MH16	3,501.12	249.94	1.706	8 inch	867.0	0.670	-1.035
WS-P17	WS-MH18	3,514.68	WS-MH17	3,503.66	500.00	1.706	12 inch	378.3	3.418	1.713
WS-P18	WS-MH19	3,525.66	WS-MH18	3,514.68	500.00	1.706	12 inch	59.8	3.412	1.707
WS-P19	WS-MH20	3,533.74	WS-MH19	3,525.76	500.00	1.706	12 inch	62.3	2.909	1.203
WSP20	WS-MH21	3,540.55	WS-MH20	3,533.74	424.40	1.706	12 inch	62.3	2.917	1.211
WT-OI-P	WT-OI-OVERFL	3,369.95	OI-MH1	3,369.79	30.00	0.000	15 inch	0.0	3.049	3.049
WT-P1	WT-MH1	3,397.50	WT-MH2	3,395.92	90.00	0.624	15 inch	26.8	5.532	4.908
WT-P2	WT-MH2	3,395.92	WT-MH3	3,394.02	189.24	0.624	15 inch	28.5	4.183	3.560
WT-P3	WT-MH3	3,394.02	WT-MH4	3,391.08	302.81	0.624	15 inch	28.6	4.114	3.490
WT-P4	WT-MH4	3,391.08	WT-MH5	3,386.23	500.00	0.624	15 inch	28.6	4.112	3.488
WT-P5	WT-MH5	3,386.23	WT-MH6	3,381.45	500.00	0.624	15 inch	28.6	4.082	3.458
WT-P6	WT-MH6	3,381.45	WT-MH7	3,376.63	500.00	0.624	15 inch	28.6	4.099	3.475
WT-P7	WT-MH7	3,376.63	WT-MH8	3,371.85	489.54	0.624	15 inch	28.6	4.125	3.502

Scenario: Build-Out- Average Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
WT-P8	WT-MH8	3,371.85	WT-MH9	3,369.95	194.63	0.624	15 inch	52.9	4.125	3.501
WT-P9	WT-MH9	3,369.95	AT-MH2	3,369.43	30.00	3.447	15 inch	67.1	5.496	2.050
WTL-P1	WTL-MH1	3,454.00	WTL-MH2	3,451.00	160.00	0.201	8 inch	39.0	1.069	0.868
WTL-P2	WTL-MH2	3,451.00	WTL-MH3	3,445.71	500.00	0.207	8 inch	39.6	0.803	0.596
WTL-P3	WTL-MH3	3,445.71	WTL-MH4	3,443.94	167.32	0.213	8 inch	45.8	0.802	0.590
WTL-P4	WTL-MH4	3,443.94	WTL-MH5	3,443.19	270.67	0.218	8 inch	46.9	0.412	0.194
WTL-P5	WTL-MH5	3,443.19	WTL-MH6	3,442.41	129.59	0.224	8 inch	41.6	0.606	0.382
WTL-P6	WTL-MH7	3,443.06	WTL-MH6	3,442.41	121.39	0.006	8 inch	23.2	0.571	0.566

Scenario: Future - Average Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
A-P1	A-MH1	3,319.42	A-MH2	3,318.89	136.27	2.0214	15 inch	413.7	2.6036	0.5822
A-P2	A-MH2	3,318.89	A-MH3	3,317.70	499.17	2.0263	15 inch	422.7	2.0384	0.0121
A-P3	A-MH3	3,317.70	A-MH4	3,316.13	426.90	2.0312	15 inch	445.6	2.5318	0.5006
A-P4	A-MH4	3,316.13	A-MH5	3,314.93	345.66	2.0361	15 inch	505.7	2.4598	0.4237
A-P5	A-MH5	3,314.93	A-MH6	3,313.80	401.57	2.0410	15 inch	527.6	2.2146	0.1736
A-P6	A-MH6	3,313.80	A-MH7	3,312.78	299.57	2.0459	15 inch	575.2	2.4361	0.3901
A-P7	A-MH7	3,312.78	A-MH8	3,313.11	34.83	2.5437	15 inch	600.6	-4.0637	-6.6074
A-P8	A-MH8	3,313.11	A-MH9	3,311.65	365.61	2.5485	15 inch	586.2	2.6382	0.0897
A-P9	A-MH9	3,311.65	A-MH10	3,310.53	399.84	2.5534	15 inch	575.0	2.2096	-0.3438
A-P10	A-MH10	3,310.53	A-MH11	3,309.60	299.71	2.5582	15 inch	578.8	2.3256	-0.2326
A-P11	A-MH11	3,309.60	A-MH12	3,307.86	629.50	2.9658	15 inch	513.5	2.1949	-0.7709
A-P12	A-MH12	3,307.86	A-MH13	3,305.99	626.95	2.9705	15 inch	417.8	2.2801	-0.6905
A-P13	A-MH13	3,305.99	A-MH14	3,304.25	628.05	2.9753	15 inch	394.0	2.1974	-0.7779
A-P14	A-MH14	3,304.25	A-MH15	3,302.47	630.87	2.9801	15 inch	341.4	2.2176	-0.7625
A-P15	A-MH15	3,302.47	A-MH16	3,301.79	242.94	2.9848	15 inch	380.1	2.2087	-0.7761
A-P16	A-MH16	3,301.79	A-MH17	3,300.75	383.11	2.9896	15 inch	384.8	2.1752	-0.8144
A-P17	A-MH17	3,300.75	A-MH18	3,299.00	627.66	2.9943	15 inch	288.6	2.2044	-0.7899
A-P18	A-MH18	3,299.00	A-MH19	3,297.23	630.84	2.9991	15 inch	170.1	2.2114	-0.7877
A-P19	A-MH19	3,297.23	A-MH20	3,295.53	234.33	3.0038	15 inch	130.1	3.5559	0.5521
A-P20	A-MH20	3,295.53	A-MH21	3,294.00	421.16	3.0086	15 inch	123.3	2.5163	-0.4923
A-P21	A-MH21	3,294.00	A-MH22	3,293.20	52.00	3.0134	16 inch	114.8	6.1507	3.1374
A-P22	A-MH22	3,293.20	A-MH23	3,292.92	198.25	3.0181	16 inch	121.7	1.8636	-1.1545
A-P23	A-MH23	3,292.92	A-MH24	3,291.77	389.75	3.0229	16 inch	93.5	2.6936	-0.3292
A-P24	A-MH24	3,291.77	A-MH25	3,289.47	200.00	3.0276	16 inch	57.4	5.3178	2.2902
A-P25	A-MH25	3,289.47	A-MH26	3,286.67	350.25	3.0324	16 inch	60.7	4.4338	1.4014
A-P26	A-MH26	3,286.67	A-MH27 (MMH	3,284.22	306.00	3.0371	16 inch	63.9	4.4372	1.4001
A-P27	A-MH27 (MMH6)	3,284.22	A-MH28	3,281.61	434.00	3.0419	16 inch	67.6	3.8456	0.8037
A-P28	A-MH28	3,281.61	A-MH29	3,279.43	376.00	3.0419	16 inch	68.0	3.7759	0.7340
A-P29	A-MH29	3,279.43	A-MH30	3,273.98	240.00	3.0419	12 inch	109.4	3.4698	0.4279
A-P30	A-MH30	3,273.98	A-MH31	3,271.60	280.00	3.0419	15 inch	152.7	3.8490	0.8071
A-P31	A-MH31	3,271.60	A-MH32	3,264.28	500.00	3.0419	12 inch	165.3	2.7860	-0.2558
A-P32	A-MH32	3,264.28	A-MH33	3,260.51	475.00	3.0419	15 inch	70.9	3.7193	0.6775
A-P33	A-MH33	3,260.51	A-MH34	3,257.15	495.00	3.0419	15 inch	73.1	3.4396	0.3977
A-P34	A-MH34	3,257.15	A-MH35	3,253.84	460.00	3.0419	15 inch	76.3	3.5414	0.4995
A-P35	A-MH35	3,253.84	A-MH36	3,251.41	450.00	3.0419	15 inch	81.2	3.0679	0.0260
A-P36	A-MH36	3,251.41	A-MH37	3,248.62	450.00	3.0419	15 inch	91.9	3.2873	0.2454
A-P37	A-MH37	3,248.62	A-MH38	3,240.61	450.00	3.0419	12 inch	142.6	3.0720	0.0301
A-P38	A-MH38	3,240.61	A-MH39	3,240.10	422.00	3.0419	18 inch	89.0	2.3600	-0.6818
A-P39	A-MH39	3,240.10	O-1	3,238.61	572.00	3.0419	18 inch	72.7	3.4649	0.4230

Appendix E:

Model Results: Peak Flow for Future Conditions

Scenario: Build-Out- Peak Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
A-P1	A-MH1	3,511.25	ETL-MH12	3,497.23	234.00	0.123	8 inch	178.0	1.912	1.789
A-P2	A-MH2	3,514.63	A-MH1	3,511.25	260.00	0.112	8 inch	29.3	0.890	0.778
A-P3	A-MH3	3,517.88	A-MH2	3,514.63	250.00	0.098	8 inch	27.7	0.890	0.792
A-P4	A-MH4	3,521.13	A-MH3	3,517.88	250.00	0.084	8 inch	25.7	0.890	0.806
A-P5	A-MH5	3,524.25	A-MH4	3,521.13	240.00	0.070	8 inch	23.6	0.890	0.820
A-P6	A-MH6	3,527.63	A-MH5	3,524.25	260.00	0.056	8 inch	21.3	0.890	0.834
A-P7	A-MH7	3,530.88	A-MH6	3,527.63	250.00	0.042	8 inch	18.7	0.890	0.848
A-P8	A-MH8	3,534.13	A-MH7	3,530.88	250.00	0.028	8 inch	15.7	0.890	0.862
A-P9	A-MH9	3,537.38	A-MH8	3,534.13	250.00	0.014	8 inch	12.0	0.890	0.876
AET-P1	AET-MH2	3,394.14	AET-MH1	3,389.97	375.66	0.000	12 inch	103.4	2.426	2.426
AET-P2	AET-MH3	3,395.65	AET-MH2	3,394.14	354.33	0.000	12 inch	0.0	1.503	1.503
AET-P3	AET-MH4	3,396.55	AET-MH3	3,395.65	212.38	0.000	12 inch	0.0	1.499	1.499
AET-P4	AET-MH5	3,398.85	AET-MH4	3,396.55	308.40	0.000	12 inch	0.0	1.988	1.988
AET-P5	AET-MH6	3,399.03	WT-MH1	3,398.85	322.62	0.000	10 inch	0.0	0.334	0.334
AET-P6	AET-MH7	3,400.00	AET-MH6	3,399.03	325.00	0.000	10 inch	0.0	0.774	0.774
AET-P7	AET-MH8	3,400.50	AET-MH7	3,400.00	300.00	0.000	10 inch	0.0	0.578	0.578
AET-P8	AET-MH9	3,401.80	AET-MH8	3,400.50	300.00	0.000	10 inch	0.0	0.932	0.932
AET-P9	AET-MH10	3,402.70	AET-MH9	3,401.80	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P10	AET-MH11	3,403.60	AET-MH10	3,402.70	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P11	AET-MH12	3,404.50	AET-MH11	3,403.60	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P12	AET-MH13	3,405.40	AET-MH12	3,404.50	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P13	AET-MH14	3,406.30	AET-MH13	3,405.40	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P14	AET-MH15	3,407.20	AET-MH14	3,406.30	300.00	0.000	10 inch	0.0	0.776	0.776
AET-P15	AET-MH16	3,409.30	AET-MH15	3,407.20	300.00	0.000	8 inch	0.0	0.653	0.653
AET-P16	AET-MH17	3,411.10	AET-MH16	3,409.30	300.20	0.000	8 inch	0.0	0.605	0.605
AET-P17	AET-MH18	3,413.85	AET-MH17	3,411.10	325.82	0.000	8 inch	0.0	0.717	0.717
AET-P18	AET-MH19	3,416.91	AET-MH18	3,413.85	314.18	0.000	8 inch	0.0	0.771	0.771
AET-P19	AET-MH20	3,418.96	AET-MH19	3,416.91	340.82	0.000	8 inch	0.0	0.606	0.606
AET-P20	AET-MH21	3,421.00	AET-MH20	3,418.96	339.18	0.000	8 inch	0.0	0.606	0.606
AET-P21	AET-MH22	3,423.67	AET-MH21	3,421.00	340.00	0.000	8 inch	0.0	0.692	0.692
AET-P23	AET-MH24	3,429.00	AET-MH23	3,426.35	337.49	0.000	8 inch	301.5	0.692	0.692
AET-P24	AET-MH25	3,431.39	AET-MH24	3,429.00	197.85	0.000	8 inch	51.4	0.858	0.858
AET-P25	AET-MH26	3,435.25	AET-MH25	3,431.39	319.12	0.000	8 inch	0.0	0.859	0.859
AETS-P1	AET-MH23	3,426.35	ETU-MH1	3,419.83	457.68	0.000	12 inch	659.5	2.748	2.748
AF-P1	AF-MH1	3,545.65	WS-MH21	3,540.55	500.00	0.773	12 inch	66.4	2.325	1.552
AF-P2	AF-MH2	3,553.04	AF-MH1	3,545.65	500.00	0.773	12 inch	41.0	2.799	2.026
AF-P3	AF-MH3	3,558.23	AF-MH2	3,553.23	500.00	0.773	12 inch	43.0	2.303	1.529
AF-P4	AF-MH4	3,562.35	AF-MH3	3,558.33	500.00	0.773	12 inch	44.3	2.065	1.291
AF-P5	AF-MH5	3,566.60	AF-MH4	3,562.35	500.00	0.773	12 inch	43.9	2.123	1.350
AF-P6	AF-MH6	3,570.39	AF-MH5	3,566.60	500.00	0.773	12 inch	44.6	2.005	1.231
AF-P7	AF-MH7	3,574.43	AF-MH6	3,570.39	500.00	0.773	12 inch	44.2	2.070	1.296
AF-P8	AF-MH8	3,579.87	AF-MH7	3,574.53	500.00	0.773	12 inch	42.7	2.380	1.606
AF-P9	AF-MH9	3,583.53	AF-MH8	3,579.97	500.00	0.773	12 inch	45.0	1.943	1.170
AF-P10	AF-MH10	3,587.09	AF-MH9	3,583.53	500.00	0.773	12 inch	45.0	1.943	1.170
AF-P11	AF-MH11	3,590.52	AF-MH10	3,587.09	483.57	0.773	12 inch	45.0	1.939	1.166
ALE-P1	ALE-MH1	3,436.22	ETL-MH38	3,435.05	132.00	1.825	8 inch	2,005.6	0.735	-1.090
ALE-P2	ALE-MH2	3,436.88	ALE-MH1	3,436.22	69.00	1.825	8 inch	1,775.2	0.764	-1.062
ALE-P3	ALE-MH3	3,439.18	ALE-MH2	3,436.88	250.00	1.825	8 inch	2,189.8	0.749	-1.076
ALE-P4	ALE-MH4	3,440.86	ALE-MH3	3,439.18	250.00	1.825	8 inch	1,846.3	0.640	-1.185
ALE-P5	ALE-MH5	3,442.43	ALE-MH4	3,440.86	250.00	1.825	8 inch	1,767.6	0.619	-1.206
ALE-P6	ALE-MH6	3,444.26	ALE-MH5	3,442.43	250.00	1.825	8 inch	1,767.6	0.668	-1.157

Scenario: Build-Out- Peak Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
ALE-P7	ALE-MH7	3,445.58	ALE-MH6	3,444.26	250.00	1.825	8 inch	1,771.3	0.567	-1.258
ALE-P8	ALE-MH8	3,447.50	ALE-MH7	3,445.58	250.00	1.825	8 inch	1,798.3	0.684	-1.141
ALE-P9	ALE-MH9	3,448.09	ALE-MH8	3,447.50	148.00	1.825	8 inch	1,582.1	0.493	-1.332
AT-P1	AT-MH1	3,371.75	WT-MH9	3,369.95	352.00	3.954	21 inch	56.6	7.323	3.369
AT-P2	AT-MH2	3,369.43	AT-MH3	3,367.19	576.17	4.579	21 inch	62.6	6.385	1.806
AT-P3	AT-MH3	3,367.19	AT-MH4	3,364.86	597.00	4.579	21 inch	62.8	6.397	1.818
AT-P4	AT-MH4	3,364.86	AT-MH5	3,362.55	593.00	4.627	21 inch	63.1	6.391	1.765
AT-P5	AT-MH5	3,362.55	AT-MH6	3,361.39	297.00	4.627	21 inch	63.0	6.400	1.773
AT-P6	AT-MH6	3,361.39	AT-MH7	3,359.36	520.00	4.627	21 inch	63.0	6.398	1.771
AT-P7	AT-MH7	3,359.36	AT-MH8	3,357.36	514.00	4.627	21 inch	63.1	6.388	1.761
AT-P8	AT-MH8	3,357.36	AT-MH9	3,355.35	516.00	4.627	21 inch	62.4	6.391	1.765
AT-P9	AT-MH9	3,355.35	AT-MH10	3,353.17	517.16	4.664	21 inch	89.4	6.649	1.985
AT-P10	AT-MH10	3,353.17	AT-MH11	3,349.90	504.44	9.081	21 inch	99.6	8.245	-0.836
AT-P11	AT-MH11	3,349.90	AT-MH12	3,349.35	70.15	9.081	21 inch	80.9	9.067	-0.014
AT-P12	AT-MH12	3,349.35	O-1	3,345.77	425.00	9.081	21 inch	79.3	9.399	0.317
AWTL-P7	AWTL-MH7	3,443.06	AWTL-MH8	3,441.16	520.00	0.000	8 inch	6.5	0.472	0.472
AWTL-P8	AWTL-MH8	3,441.16	AWTL-MH9	3,439.67	248.00	0.022	8 inch	15.8	0.605	0.584
AWTL-P9	AWTL-MH9	3,439.67	AWTL-MH10	3,438.17	250.00	0.043	8 inch	127.1	0.605	0.561
AWTL-P10	AWTL-MH10	3,438.17	AWTL-MH11	3,436.67	250.00	0.065	8 inch	346.7	0.605	0.540
AWTL-P11	AWTL-MH11	3,436.67	AWTL-MH12	3,435.17	250.00	0.182	8 inch	560.2	0.605	0.423
AWTL-P12	AWTL-MH12	3,435.17	AWTL-MH13	3,433.28	315.00	0.196	8 inch	789.4	0.605	0.409
AWTL-P13	AWTL-MH13	3,433.28	AWTL-MH14	3,431.68	267.00	0.209	8 inch	1,022.0	0.605	0.396
AWTL-P14	AWTL-MH14	3,431.68	AWTL-MH15	3,429.85	262.00	0.715	8 inch	1,100.1	0.653	-0.063
AWTL-P15	AWTL-MH15	3,429.85	AWTL-MH16	3,428.02	262.00	0.724	8 inch	1,048.5	0.653	-0.071
AWTL-P16	AWTL-MH16	3,428.02	AWTL-MH17	3,426.19	262.00	0.732	8 inch	1,176.8	0.653	-0.079
AWTL-P17	AWTL-MH17	3,426.19	AWTL-MH18	3,424.20	267.00	0.740	8 inch	1,170.6	0.674	-0.066
AWTL-P18	AWTL-MH18	3,424.20	AWTL-MH19	3,420.14	338.00	1.366	8 inch	1,304.7	0.856	-0.510
AWTL-P19	AWTL-MH19	3,420.14	AWTL-MH20	3,417.64	208.00	1.372	8 inch	1,210.6	0.856	-0.516
AWTL-P20	AWTL-MH20	3,417.64	AWTL-MH21	3,412.48	430.00	1.379	8 inch	1,708.7	0.856	-0.523
AWTL-P21	AWTL-MH21	3,412.48	AWTL-MH22	3,408.97	255.00	1.385	8 inch	1,213.0	0.916	-0.469
AWTL-P22	AWTL-MH22	3,408.97	AWTL-MH23	3,407.77	299.11	1.392	10 inch	945.0	0.897	-0.495
AWTL-P23	AWTL-MH23	3,407.77	AWTL-MH24	3,406.37	350.00	1.398	10 inch	784.4	0.896	-0.503
AWTL-P24	AWTL-MH24	3,406.37	AWTU-MH4	3,404.94	326.45	1.405	10 inch	798.2	0.937	-0.468
AWTU-P1	AWTU-MH1	3,409.61	AWTU-MH2	3,407.39	240.00	0.495	12 inch	234.6	2.215	1.720
AWTU-P2	AWTU-MH2	3,407.39	AWTU-MH3	3,406.44	101.59	0.504	12 inch	385.1	2.227	1.723
AWTU-P3	AWTU-MH3	3,406.44	AWTU-MH4	3,404.94	84.04	0.513	12 inch	503.1	3.076	2.563
AWTU-P4	AWTU-MH4	3,404.94	AWTU-MH5	3,402.70	223.55	1.666	10 inch	771.3	1.417	-0.249
AWTU-P5	AWTU-MH5	3,402.70	AWTU-MH6	3,398.70	400.00	1.672	10 inch	730.6	1.416	-0.256
AWTU-P6	AWTU-MH6	3,398.70	AWTU-MH7 (M	3,397.10	400.00	1.707	10 inch	1,057.2	0.896	-0.811
AWTU-P7	AWTU-MH7 (MM	3,397.10	AWTU-MH8	3,393.83	400.00	1.971	10 inch	535.9	1.280	-0.690
AWTU-P8	AWTU-MH8	3,393.83	AWTU-MH9	3,391.87	265.75	3.174	15 inch	195.1	3.585	0.412
AWTU-P9	AWTU-MH9	3,391.87	AWTU-MH10	3,390.23	415.03	3.174	15 inch	181.8	2.624	-0.549
AWTU-P10	AWTU-MH10	3,390.23	AET-MH1	3,389.97	14.76	3.174	15 inch	158.4	5.540	2.367
BUR-P1	AET-MH1	3,389.97	BUR-MH1	3,387.70	356.06	3.174	15 inch	173.9	3.333	0.160
BUR-P2	BUR-MH1	3,387.70	BUR-MH2	3,384.94	524.00	3.174	15 inch	171.7	3.030	-0.144
BUR-P3	BUR-MH2	3,384.94	BUR-MH3	3,381.40	525.00	3.174	15 inch	181.2	3.428	0.255
BUR-P4	BUR-MH3	3,381.40	BUR-MH4	3,377.85	535.00	3.174	15 inch	219.8	3.401	0.227
BUR-P5	BUR-MH4	3,377.85	BUR-MH5	3,376.23	592.00	3.174	15 inch	149.8	2.184	-0.990
BUR-P6	BUR-MH5	3,376.23	BUR-MH6	3,373.16	295.28	3.174	15 inch	74.9	4.257	1.083
BUR-P7	BUR-MH6	3,373.16	AT-MH1	3,371.75	220.40	3.174	15 inch	75.6	3.339	0.166
DT-P1	DT-MH1	3,473.50	DT-MH2	3,470.00	130.00	0.018	12 inch	9.3	3.778	3.760

Scenario: Build-Out- Peak Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
DT-P2	DT-MH2	3,470.00	DT-MH3	3,468.93	357.70	0.037	12 inch	11.8	1.259	1.223
DT-P3	DT-MH3	3,468.93	DT-MH4	3,467.29	198.06	0.055	12 inch	15.2	2.095	2.040
DT-P4	DT-MH4	3,467.29	DT-MH5	3,466.50	96.22	0.133	12 inch	19.4	2.086	1.953
DT-P5	DT-MH5	3,466.50	DT-MH6	3,464.45	400.00	0.146	12 inch	20.2	1.648	1.503
DT-P6	DT-MH6	3,464.45	DT-MH7	3,461.40	405.00	0.158	12 inch	20.7	1.998	1.840
DT-P7	DT-MH7	3,461.40	DT-MH8	3,458.35	400.00	0.170	12 inch	21.4	2.011	1.841
DT-P8	DT-MH8	3,458.35	DT-MH9	3,452.93	400.00	0.181	12 inch	22.1	2.680	2.499
DT-P9	DT-MH9	3,452.93	DT-MH10	3,447.50	410.00	0.193	12 inch	23.3	2.650	2.457
DT-P10	DT-MH10	3,447.50	DT-MH11	3,445.60	400.00	0.204	12 inch	24.0	1.587	1.383
DT-P11	DT-MH11	3,445.60	HT-MH19	3,441.01	272.00	0.214	12 inch	40.7	2.991	2.777
ETL-P2	ETL-MH2	3,506.53	ETL-MH3	3,505.43	324.00	1.214	12 inch	283.0	1.342	0.127
ETL-P3	ETL-MH3	3,505.43	ETL-MH4	3,504.56	325.00	1.219	12 inch	290.9	1.191	-0.027
ETL-P4	ETL-MH4	3,504.56	ETL-MH5	3,503.70	329.00	1.243	12 inch	284.0	1.177	-0.065
ETL-P5	ETL-MH5	3,503.70	ETL-MH6	3,502.73	346.00	1.247	12 inch	276.8	1.219	-0.028
ETL-P6	ETL-MH6	3,502.73	ETL-MH7	3,501.90	308.00	1.267	12 inch	269.4	1.195	-0.071
ETL-P7	ETL-MH7	3,501.90	ETL-MH8	3,501.01	330.00	1.271	12 inch	258.6	1.196	-0.075
ETL-P8	ETL-MH8	3,501.01	ETL-MH9	3,500.12	331.00	1.275	12 inch	246.5	1.194	-0.081
ETL-P9	ETL-MH9	3,500.12	ETL-MH10	3,499.23	292.00	1.280	12 inch	239.7	1.271	-0.008
ETL-P10	ETL-MH10	3,499.23	ETL-MH11	3,498.24	374.00	1.284	12 inch	230.4	1.185	-0.099
ETL-P11	ETL-MH11	3,498.24	ETL-MH12	3,497.23	337.00	1.288	12 inch	219.5	1.261	-0.028
ETL-P12	ETL-MH12	3,497.23	ETL-MH13	3,496.53	250.00	1.331	12 inch	210.5	1.218	-0.113
ETL-P13	ETL-MH13	3,496.53	ETL-MH14	3,495.83	250.00	1.335	12 inch	196.7	1.218	-0.117
ETL-P14	ETL-MH14	3,495.83	ETL-MH15	3,495.03	250.00	1.340	12 inch	187.3	1.303	-0.037
ETL-P15	ETL-MH15	3,495.03	ETL-MH16	3,492.61	250.00	1.344	12 inch	263.4	2.265	0.921
ETL-P16	ETL-MH16	3,492.61	ETL-MH17	3,490.81	250.00	1.348	12 inch	388.9	1.954	0.606
ETL-P17	ETL-MH17	3,490.81	ETL-MH18	3,488.52	304.00	1.352	12 inch	498.1	1.998	0.646
ETL-P18	ETL-MH18	3,488.52	ETL-MH19	3,487.24	473.00	1.671	12 inch	499.7	1.198	-0.473
ETL-P19	ETL-MH19	3,487.24	ETL-MH20	3,485.93	448.00	1.675	12 inch	386.1	1.245	-0.430
ETL-P20	ETL-MH20	3,485.93	ETL-MH21	3,485.75	30.00	1.679	12 inch	334.1	1.784	0.105
ETL-P21	ETL-MH21	3,485.75	ETL-MH22	3,484.40	501.00	1.683	12 inch	268.9	1.195	-0.487
ETL-P22	ETL-MH22	3,484.40	ETL-MH23	3,482.95	496.00	1.687	12 inch	137.4	1.245	-0.442
ETL-P23	ETL-MH23	3,482.95	ETL-MH24	3,478.64	255.00	1.830	12 inch	64.3	2.994	1.164
ETL-P24	ETL-MH24	3,478.64	ETL-MH25	3,472.21	383.00	1.834	12 inch	194.4	2.983	1.150
ETL-P25	ETL-MH25	3,472.21	ETL-MH26	3,467.03	385.00	2.091	12 inch	416.8	2.671	0.580
ETL-P26	ETL-MH26	3,467.03	ETL-MH27	3,465.04	398.00	2.095	12 inch	661.2	1.628	-0.467
ETL-P27	ETL-MH27	3,465.04	ETL-MH28	3,462.90	402.00	2.098	12 inch	649.9	1.680	-0.418
ETL-P28	ETL-MH28	3,462.90	ETL-MH29	3,461.16	402.00	4.328	12 inch	1,327.1	1.515	-2.813
ETL-P29	ETL-MH29	3,461.16	ETL-MH30	3,459.42	402.00	4.331	12 inch	1,402.0	1.515	-2.816
ETL-P30	ETL-MH30	3,459.42	ETL-MH31	3,457.68	402.00	4.333	12 inch	1,576.9	1.515	-2.819
ETL-P31	ETL-MH31	3,457.68	ETL-MH32	3,455.94	402.00	4.336	12 inch	1,481.8	1.515	-2.821
ETL-P32	ETL-MH32	3,455.94	ETL-MH33	3,454.13	402.00	4.339	12 inch	1,450.2	1.545	-2.794
ETL-P33	ETL-MH33	3,454.13	ETL-MH34	3,451.50	402.00	4.342	12 inch	1,213.2	1.862	-2.479
ETL-P34	ETL-MH34	3,451.50	ETL-MH35	3,449.22	404.00	5.187	12 inch	1,749.1	1.730	-3.457
ETL-P35	ETL-MH35	3,449.22	ETL-MH36 (M	3,444.25	404.00	5.190	12 inch	1,492.6	2.554	-2.636
ETL-P36	ETL-MH36 (MMH	3,444.25	ETL-MH37	3,437.82	404.00	5.317	12 inch	1,573.6	2.905	-2.412
ETL-P37	ETL-MH37	3,437.82	ETL-MH38	3,435.05	177.00	5.317	12 inch	1,368.4	2.880	-2.437
ETL-P38	ETL-MH38	3,435.05	ETL-MH39	3,432.32	219.00	6.205	14 inch	1,063.7	3.878	-2.327
ETL-P39	ETL-MH39	3,432.32	ETL-MH40	3,430.33	357.00	6.205	15 inch	1,116.7	3.117	-3.088
ETL-P40	ETL-MH40	3,430.33	ETL-MH41	3,427.71	369.09	6.205	12 inch	2,174.0	2.102	-4.104
ETL-P41	ETL-MH41	3,427.71	ETL-MH42	3,425.08	216.54	6.205	12 inch	1,644.5	2.749	-3.456
ETL-P42	ETL-MH42	3,425.08	ETL-MH43	3,423.53	234.58	6.205	12 inch	1,590.3	2.028	-4.178

Scenario: Build-Out- Peak Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
ETL-P43	ETL-MH43	3,423.53	ETL-MH44	3,421.85	273.95	6.205	12 inch	1,577.7	1.953	-4.252
ETL-P44	ETL-MH44	3,421.85	ETU-MH1	3,419.83	249.34	6.205	15 inch	927.9	3.758	-2.448
ETL-WST-P1	WS-MH1	3,465.30	ETL-MH28	3,462.90	131.92	3.064	12 inch	586.8	3.106	0.041
ETL Overflow	ETL-Overflow	3,507.30	ETL-HTL MH	3,504.06	321.52	0.000	8 inch	0.0	0.784	0.784
ETLL1-P1	ETLL1-MH1	3,517.77	ETLL1-MH2	3,517.08	14.00	1.183	12 inch	58.0	5.112	3.929
ETLL1-P2	ETLL1-MH2	3,517.08	ETLL1-MH3	3,515.56	238.00	1.188	12 inch	58.2	1.840	0.652
ETLL1-P3	ETLL1-MH3	3,515.56	ETLL1-MH4	3,513.42	267.00	1.192	12 inch	57.9	2.061	0.869
ETLL1-P4	ETLL1-MH4	3,513.42	ETLL1-MH5	3,511.38	243.00	1.197	12 inch	60.3	2.110	0.913
ETLL1-P5	ETLL1-MH5	3,511.38	ETLL1-MH6	3,510.00	260.00	1.201	12 inch	60.4	1.678	0.476
ETLL1-P6	ETLL1-MH6	3,510.00	ETLL1-MH7	3,506.79	391.00	1.205	12 inch	158.3	2.086	0.881
ETLL1-P7	ETLL1-MH7	3,506.79	ETL-MH2	3,506.53	41.01	1.210	12 inch	265.7	1.833	0.624
ETLL2-P1	ETLL2-MH1	3,505.97	ETLL2-MH2	3,504.74	230.00	0.771	8 inch	1,075.0	0.571	-0.200
ETLL2-P2	ETLL2-MH2	3,504.74	ETLL2-MH3	3,503.70	219.00	0.778	8 inch	1,180.1	0.538	-0.240
ETLL2-P3	ETLL2-MH3	3,503.70	ETLL2-MH4	3,502.39	372.00	0.809	8 inch	1,161.6	0.463	-0.345
ETLL2-P4	ETLL2-MH4	3,502.39	ETLL2-MH5	3,501.26	335.43	0.815	8 inch	771.3	0.453	-0.362
ETLL2-P5	ETLL2-MH5	3,501.26	ETLL2-MH6	3,500.94	92.21	0.822	8 inch	529.3	0.460	-0.362
ETLL2-P6	ETLL2-MH6	3,500.94	HTL-MH1	3,499.25	336.29	0.879	8 inch	279.6	0.554	-0.325
ETU-P1	ETU-MH1	3,419.83	ETU-MH2	3,414.67	375.00	6.205	15 inch	663.4	4.897	-1.308
ETU-P2	ETU-MH2	3,414.67	ETU-MH3	3,408.79	400.00	6.205	15 inch	639.1	5.062	-1.144
ETU-P3	ETU-MH3	3,408.79	ETU-MH4	3,402.61	417.00	6.205	15 inch	921.3	5.082	-1.123
ETU-P4	ETU-MH4	3,402.61	ETU-MH5	3,396.41	500.00	6.205	15 inch	993.9	4.649	-1.556
ETU-P5	ETU-MH5	3,396.41	ETU-MH6	3,391.31	500.00	6.205	15 inch	1,037.9	4.216	-1.989
ETU-P6	ETU-MH6	3,391.31	ETU-MH7	3,387.65	469.00	6.205	15 inch	856.1	3.688	-2.517
ETU-P7	ETU-MH7	3,387.65	ETU-MH8	3,384.12	453.00	6.205	15 inch	1,017.5	3.685	-2.520
ETU-P8	ETU-MH8	3,384.12	ETU-MH9	3,380.61	450.00	6.205	15 inch	1,080.5	3.687	-2.518
ETU-P9	ETU-MH9	3,380.61	ETU-MH10	3,377.67	376.00	6.205	15 inch	1,065.1	3.692	-2.514
ETU-P10	ETU-MH10	3,377.67	ETU-MH11	3,375.51	278.00	6.205	15 inch	1,086.5	3.680	-2.525
ETU-P11	ETU-MH11	3,375.51	ETU-MH12	3,373.58	234.00	6.205	15 inch	1,187.2	3.792	-2.414
ETU-P12	ETU-MH12	3,373.58	ETU-MH13	3,369.59	468.00	6.205	15 inch	1,198.8	3.855	-2.351
ETU-P13	ETU-MH13	3,369.59	ETU-MH14	3,365.63	460.00	6.205	15 inch	1,157.7	3.874	-2.332
ETU-P14	ETU-MH14	3,365.63	ETU-MH15	3,362.33	384.00	6.205	15 inch	1,060.9	3.870	-2.335
ETU-P15	ETU-MH15	3,362.33	ETU-MH16	3,358.03	500.00	6.205	15 inch	941.0	3.872	-2.334
ETU-P16	ETU-MH16	3,358.03	AT-MH10	3,353.17	507.00	6.205	15 inch	417.5	4.087	-2.118
FT-P1	FT-MH1	3,528.89	FT-MH2	3,515.96	685.70	0.182	6 inch	56.2	0.498	0.316
FT-P2	FT-MH2	3,515.96	FT-MH3	3,513.60	103.35	0.217	6 inch	59.9	0.548	0.331
FT-P3	FT-MH3	3,513.60	FT-MH4	3,505.16	400.26	0.234	6 inch	73.8	0.527	0.293
FT-P4	FT-MH4	3,505.16	FT-MH5	3,501.77	198.49	0.482	6 inch	87.5	0.474	-0.008
FT-P5	FT-MH5	3,501.77	FT-MH6	3,493.29	431.43	0.510	6 inch	85.3	0.508	-0.001
FT-P6	FT-MH6	3,493.29	FT-MH7	3,491.78	123.03	0.522	8 inch	64.2	0.865	0.343
FT-P7	FT-MH7	3,491.78	FT-MH8	3,488.49	324.80	0.534	8 inch	64.9	0.786	0.252
FT-P8	FT-MH8	3,488.49	FT-MH9	3,486.90	187.01	0.546	8 inch	65.7	0.720	0.174
FT-P9	FT-MH9	3,486.90	FT-MH10	3,485.73	95.14	0.558	8 inch	66.4	0.866	0.308
FT-P10	FT-MH10	3,485.73	FT-MH11	3,483.51	159.12	0.570	8 inch	67.1	0.922	0.353
FT-P11	FT-MH11	3,483.51	FT-MH12	3,479.88	287.07	0.582	8 inch	114.9	0.878	0.296
FT-P12	FT-MH12	3,479.88	FT-MH13	3,477.96	234.58	0.593	8 inch	204.8	0.707	0.113
FT-P13	FT-MH13	3,477.96	FT-MH14	3,476.96	121.39	0.605	8 inch	267.6	0.709	0.104
FT-P14	FT-MH14	3,476.96	FT-MH15	3,475.46	147.64	0.617	8 inch	331.4	0.787	0.171
FT-P15	FT-MH15	3,475.46	FT-MH16	3,473.49	223.10	0.628	8 inch	414.4	0.734	0.106
FT-P16	FT-MH16	3,473.49	FT-MH17	3,473.36	26.25	0.640	8 inch	450.4	0.550	-0.090
FT-P17	FT-MH17	3,473.36	FT-MH18	3,471.87	132.87	0.651	8 inch	489.5	0.827	0.176
FT-P18	FT-MH18	3,471.87	FT-MH19	3,470.34	159.12	0.662	8 inch	561.1	0.766	0.104

Scenario: Build-Out- Peak Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
FT-P19	FT-MH19	3,470.34	FT-MH20	3,468.58	146.00	0.692	8 inch	636.1	0.857	0.166
FT-P20	FT-MH20	3,468.58	FT-MH21	3,467.28	132.87	0.703	8 inch	699.0	0.772	0.070
FT-P21	FT-MH21	3,467.28	FT-MH22	3,466.75	22.97	0.714	8 inch	741.1	1.186	0.473
FT-P22	FT-MH22	3,466.75	FT-MH23	3,465.00	229.66	0.725	8 inch	770.1	0.682	-0.043
FT-P23	FT-MH23	3,465.00	FT-MH24	3,463.00	254.27	0.736	8 inch	800.6	0.693	-0.043
FT-P24	FT-MH24	3,463.00	FT-MH25	3,461.56	242.78	0.746	8 inch	857.8	0.601	-0.145
FT-P25	FT-MH25	3,461.56	FT-MH26	3,460.27	137.80	0.758	8 inch	841.5	0.756	-0.002
FT-P26	FT-MH26	3,460.27	FT-MH27	3,457.57	300.20	0.768	8 inch	825.5	0.741	-0.028
FT-P27	FT-MH27	3,457.57	FT-MH28	3,456.70	127.95	0.779	8 inch	779.7	0.644	-0.135
FT-P28	FT-MH28	3,456.70	FT-MH29	3,455.27	131.23	0.790	8 inch	756.1	0.815	0.026
FT-P29	FT-MH29	3,455.27	FT-MH30	3,453.99	132.87	0.800	8 inch	754.1	0.767	-0.034
FT-P30	FT-MH30	3,453.99	FT-MH31	3,452.98	113.19	0.811	8 inch	738.7	0.738	-0.073
FT-P31	FT-MH31	3,452.98	FT-MH32	3,451.91	132.87	0.821	8 inch	728.9	0.701	-0.120
FT-P32	FT-MH32	3,451.91	FT-MH33	3,450.48	118.11	0.831	8 inch	716.1	0.859	0.028
FT-P33	FT-MH33	3,450.48	FT-MH34	3,447.71	260.83	0.842	8 inch	703.5	0.805	-0.037
FT-P34	FT-MH34	3,447.71	FT-MH35	3,445.71	175.52	0.852	8 inch	761.2	0.834	-0.018
FT-P35	FT-MH35	3,445.71	FT-MH36	3,439.68	590.55	0.862	8 inch	1,224.6	0.789	-0.073
FT-P36	FT-MH36	3,439.68	FT-MH37	3,438.55	155.84	0.872	8 inch	1,201.1	0.665	-0.207
FT-P37	FT-MH37	3,438.55	FT-MH38	3,437.31	198.49	0.883	8 inch	1,078.1	0.617	-0.265
FT-P38	FT-MH38	3,437.31	FT-MH39	3,435.34	398.62	0.893	8 inch	906.6	0.549	-0.344
FT-P39	FT-MH39	3,435.34	FT-MH40	3,435.03	44.29	0.903	8 inch	642.6	0.653	-0.249
FT-P40	FT-MH40	3,435.03	FT-MH41	3,432.22	363.50	0.913	8 inch	459.9	0.687	-0.226
FT-P41	FT-MH41	3,432.22	FT-MH42	3,425.00	533.14	0.923	8 inch	281.6	0.909	-0.014
FT-P42	FT-MH42	3,425.00	FT-MH43	3,420.68	310.00	0.933	8 inch	257.4	0.922	-0.011
FT-P43	FT-MH43	3,420.68	MT-MH30	3,416.50	300.00	0.943	8 inch	235.6	0.922	-0.021
HT-P1	HT-MH1	3,486.66	HT-MH2	3,485.76	180.85	0.018	8 inch	35.1	0.551	0.533
HT-P2	HT-MH2	3,485.76	HT-MH3	3,483.95	220.05	0.037	8 inch	193.2	0.708	0.672
HT-P3	HT-MH3	3,483.95	HT-MH4	3,482.74	300.51	0.951	10 inch	254.2	0.899	-0.052
HT-P4	HT-MH4	3,482.74	HT-MH5	3,481.04	427.38	0.957	10 inch	230.5	0.893	-0.064
HT-P5	HT-MH5	3,481.04	HT-MH6	3,479.44	400.00	0.963	10 inch	200.4	0.896	-0.068
HT-P6	HT-MH6	3,479.44	HT-MH7	3,478.18	314.75	0.969	10 inch	172.4	0.896	-0.073
HT-P7	HT-MH7	3,478.18	HT-MH8	3,477.19	248.25	0.985	10 inch	146.8	0.894	-0.091
HT-P8	HT-MH8	3,477.19	HT-MH9	3,476.21	243.00	0.992	10 inch	121.4	0.899	-0.092
HT-P9	HT-MH9	3,476.21	HT-MH10	3,475.04	294.00	0.998	10 inch	87.9	0.893	-0.104
HT-P10	HT-MH10	3,475.04	HT-MH11	3,469.72	484.00	1.004	10 inch	67.1	1.485	0.481
HT-P11	HT-MH11	3,469.72	HT-MH12	3,466.57	286.00	1.010	10 inch	67.3	1.486	0.476
HT-P12	HT-MH12	3,466.57	HT-MH13	3,462.94	330.00	1.016	10 inch	67.6	1.485	0.469
HT-P13	HT-MH13	3,462.94	HT-MH14	3,458.54	400.00	1.022	10 inch	67.8	1.485	0.463
HT-P14	HT-MH14	3,458.54	HT-MH15	3,455.06	317.00	1.028	10 inch	64.6	1.484	0.455
HT-P15	HT-MH15	3,455.06	HT-MH16	3,450.84	383.00	1.075	12 inch	54.9	2.417	1.342
HT-P16	HT-MH16	3,450.84	HT-MH17	3,446.65	381.00	1.081	12 inch	55.1	2.415	1.333
HT-P17	HT-MH17	3,446.65	HT-MH18	3,443.76	263.00	1.087	12 inch	55.2	2.414	1.326
HT-P18	HT-MH18	3,443.76	HT-MH19	3,441.01	250.00	1.093	12 inch	56.5	2.415	1.322
HT-P19	HT-MH19	3,441.01	HT-MH20	3,436.95	406.00	1.186	12 inch	57.8	2.303	1.117
HT-P20	HT-MH20	3,436.95	HT-MH21	3,432.95	400.00	1.192	12 inch	58.6	2.303	1.111
HT-P21	HT-MH21	3,432.95	HT-MH22	3,429.35	400.00	1.254	12 inch	59.5	2.184	0.930
HT-P22	HT-MH22	3,429.35	HT-MH23	3,428.00	149.55	1.260	12 inch	59.6	2.188	0.928
HT-P23	HT-MH23	3,428.00	HT-MH24	3,424.15	350.45	1.265	12 inch	59.7	2.413	1.148
HT-P24	HT-MH24	3,424.15	HT-MH25	3,420.85	300.00	1.271	12 inch	59.9	2.415	1.144
HT-P25	HT-MH25	3,420.85	HT-MH26	3,416.45	400.00	1.277	12 inch	60.0	2.415	1.138
HT-P26	HT-MH26	3,416.45	HT-MH27	3,412.05	400.00	1.282	12 inch	60.3	2.415	1.133

Scenario: Build-Out- Peak Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
HT-P27	HT-MH27	3,412.05	HT-MH28	3,407.65	400.00	1.297	12 inch	60.5	2.415	1.118
HT-P28	HT-MH28	3,407.65	HT-MH29 (MM	3,403.25	399.41	1.302	12 inch	56.4	2.417	1.114
HT-P29	HT-MH29 (MMH:	3,403.25	WT-MH1	3,397.50	400.59	1.302	12 inch	54.5	2.759	1.456
HTL-P1	HTL-MH1	3,499.25	ETL-HTL MH	3,497.40	34.45	0.886	10 inch	49.2	3.281	2.396
HTL-P2	HTL-MH2	3,495.17	HTL-MH3	3,494.83	359.25	0.892	10 inch	135.9	0.436	-0.456
HTL-P3	HTL-MH3	3,494.83	HTL-MH4	3,494.51	39.37	0.898	10 inch	63.4	1.277	0.378
HTL-P4	HTL-MH4	3,494.51	HTL-MH5	3,492.76	175.30	0.905	10 inch	63.6	1.533	0.628
HTL-P5	HTL-MH5	3,492.76	HTL-MH6	3,490.59	167.10	0.911	10 inch	63.9	1.748	0.837
HTL-P6	HTL-MH6	3,490.59	HTL-MH7	3,486.92	282.60	0.918	10 inch	64.1	1.614	0.696
HTL-P7	HTL-MH7	3,486.92	HT-MH3	3,483.95	221.43	0.924	10 inch	163.5	1.640	0.716
HTL-PETL	ETL-HTL MH	3,497.40	HTL-MH2	3,495.17	58.75	0.886	10 inch	135.7	2.759	1.873
KT-P1	KT-MH1	3,424.42	KT-MH2	3,422.85	393.70	0.775	10 inch	66.0	0.894	0.119
KT-P2	KT-MH2	3,422.85	KT-MH3	3,415.85	350.00	0.812	10 inch	60.7	2.003	1.191
KT-P3	KT-MH3	3,415.85	KT-MH4	3,409.85	300.00	0.848	10 inch	62.6	2.003	1.155
KT-P4	KT-MH4	3,409.85	KT-MH5	3,404.45	300.00	0.909	10 inch	64.3	1.900	0.990
KT-P5	KT-MH5	3,404.45	KT-MH6	3,398.05	400.00	0.944	10 inch	78.5	1.791	0.847
KT-P6	KT-MH6	3,398.05	KT-MH7	3,397.25	200.00	0.978	10 inch	79.7	0.896	-0.083
KT-P7	KT-MH7	3,397.25	KT-MH8	3,389.25	400.00	1.012	10 inch	68.3	2.003	0.990
KT-P8	KT-MH8	3,389.25	KT-MH9	3,386.05	400.00	1.046	10 inch	70.0	1.267	0.221
KT-P9	KT-MH9	3,386.05	KT-MH10	3,381.85	300.00	1.115	10 inch	71.2	1.675	0.560
KT-P10	KT-MH10	3,381.85	KT-MH11	3,376.25	400.00	1.148	10 inch	240.4	1.675	0.528
KT-P11	KT-MH11	3,376.25	KT-MH12 (MM	3,374.65	400.00	1.461	10 inch	244.9	0.896	-0.566
KT-P12	KT-MH12 (MMH:	3,374.65	AT-MH1	3,371.75	383.00	1.461	12 inch	78.0	2.004	0.542
MT-P4	MT-MH4	3,496.54	MT-MH5	3,491.45	268.00	0.083	12 inch	20.4	3.173	3.090
MT-P5	MT-MH5	3,491.45	MT-MH6	3,486.05	288.00	0.260	12 inch	26.6	3.153	2.893
MT-P6	MT-MH6	3,486.05	MT-MH7	3,481.28	247.00	0.276	12 inch	27.4	3.200	2.924
MT-P7	MT-MH7	3,481.28	MT-MH8	3,476.52	250.50	0.291	12 inch	28.1	3.174	2.883
MT-P8	MT-MH8	3,476.52	MT-MH9	3,471.69	256.50	0.306	12 inch	28.9	3.160	2.854
MT-P9	MT-MH9	3,471.69	MT-MH10	3,468.06	279.00	0.321	12 inch	30.2	2.626	2.306
MT-P10	MT-MH10	3,468.06	MT-MH11	3,464.34	286.00	0.365	12 inch	31.5	2.626	2.261
MT-P11	MT-MH11	3,464.34	MT-MH12	3,461.32	233.00	0.378	12 inch	32.1	2.621	2.243
MT-P12	MT-MH12	3,461.32	MT-MH13	3,457.85	266.50	0.392	12 inch	32.7	2.627	2.235
MT-P13	MT-MH13	3,457.85	MT-MH14	3,454.59	251.00	0.405	12 inch	33.4	2.624	2.219
MT-P14	MT-MH14	3,454.59	MT-MH15	3,450.87	286.00	0.426	12 inch	34.1	2.626	2.200
MT-P15	MT-MH15	3,450.87	MT-MH16	3,447.15	286.50	0.439	12 inch	34.6	2.624	2.185
MT-P16	MT-MH16	3,447.15	MT-MH17	3,445.15	250.00	0.452	12 inch	35.1	2.059	1.608
MT-P17	MT-MH17	3,445.15	MT-MH18	3,443.15	251.00	0.464	12 inch	35.6	2.055	1.591
MT-P18	MT-MH18	3,443.15	MT-MH19	3,441.15	249.50	0.477	12 inch	36.1	2.062	1.584
MT-P19	MT-MH19	3,441.15	MT-MH20	3,440.11	142.72	0.490	12 inch	36.6	1.966	1.476
MT-P20	MT-MH20	3,440.11	MT-MH21	3,435.97	298.56	0.502	12 inch	37.1	2.711	2.209
MT-P21	MT-MH21	3,435.97	MT-MH22	3,433.75	152.56	0.515	12 inch	37.5	2.778	2.263
MT-P22	MT-MH22	3,433.75	MT-MH23	3,432.28	106.63	0.527	12 inch	38.0	2.704	2.177
MT-P23	MT-MH23	3,432.28	MT-MH24	3,431.09	96.78	0.539	12 inch	38.4	2.549	2.010
MT-P24	MT-MH24	3,431.09	MT-MH25	3,429.39	152.56	0.551	12 inch	38.9	2.433	1.883
MT-P25	MT-MH25	3,429.39	MT-MH26	3,426.93	250.00	0.567	12 inch	39.4	2.284	1.717
MT-P26	MT-MH26	3,426.93	MT-MH27	3,424.35	260.00	0.579	12 inch	48.3	2.294	1.715
MT-P27	MT-MH27	3,424.35	MT-MH28	3,421.70	376.00	1.156	12 inch	57.0	1.933	0.777
MT-P28	MT-MH28	3,421.70	MT-MH29	3,419.68	288.00	1.165	12 inch	57.3	1.928	0.764
MT-P29	MT-MH29	3,419.68	MT-MH30	3,416.50	288.00	1.174	12 inch	102.5	2.420	1.246
MT-P30	MT-MH30	3,416.50	MT-MH31	3,414.52	449.00	1.774	12 inch	111.7	1.529	-0.245
MT-P31	MT-MH31	3,414.52	MT-MH32	3,411.72	400.00	1.782	12 inch	76.0	1.926	0.145

Scenario: Build-Out- Peak Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
MT-P32	MT-MH32	3,411.72	MT-MH33	3,408.92	399.40	1.789	12 inch	73.8	1.928	0.139
MT-P33	MT-MH33	3,408.92	MT-MH34	3,407.39	148.90	1.797	12 inch	71.6	2.334	0.537
MT-P34	MT-MH34	3,407.39	MT-MH35	3,402.29	581.00	1.805	12 inch	71.7	2.157	0.352
MT-P35	MT-MH35	3,402.29	MT-MH36 (MM	3,396.98	590.00	1.813	12 inch	70.7	2.184	0.372
MT-P36	MT-MH36 (MMH	3,396.98	AWTU-MH8	3,393.83	593.83	1.841	15 inch	117.1	3.041	1.200
OI-P1	OI-MH1	3,369.79	OT-MH2	3,366.65	585.00	0.000	15 inch	0.0	3.059	3.059
OI-P2	OT-MH2	3,366.65	OT-MH3	3,364.82	575.00	0.000	15 inch	0.0	2.355	2.355
OI-P3	OT-MH3	3,364.82	OT-MH-4	3,362.87	560.00	0.000	15 inch	0.0	2.464	2.464
OI-P4	OT-MH-4	3,362.87	OT-MH5	3,360.92	595.00	0.000	15 inch	0.0	2.390	2.390
OI-P5	OT-MH5	3,360.92	OT-MH-6	3,359.20	560.00	0.000	15 inch	0.0	2.314	2.314
OI-P6	OT-MH-6	3,359.20	OT-MH7	3,357.19	565.00	0.000	15 inch	0.0	2.490	2.490
OI-P7	OT-MH7	3,357.19	OT-MH8	3,355.37	610.00	0.000	15 inch	0.0	2.280	2.280
OI-P8	OT-MH8	3,355.37	OT-MH9	3,352.33	510.00	0.000	15 inch	0.0	3.223	3.223
OI-P9	OT-MH9	3,352.33	OT-MH10	3,351.49	510.00	0.000	15 inch	0.0	1.694	1.694
OI-P10	OT-MH10	3,351.49	O-1	3,345.77	425.00	0.000	15 inch	0.0	4.843	4.843
WM-P1	WTL-MH6	3,442.41	WM-MH1	3,439.24	272.00	0.637	10 inch	53.1	1.529	0.892
WM-P2	WM-MH1	3,439.24	WM-MH2	3,434.80	398.00	0.648	10 inch	55.0	1.496	0.848
WM-P3	WM-MH2	3,434.80	WM-MH3	3,432.84	340.00	0.659	10 inch	56.7	1.075	0.416
WM-P4	WM-MH3	3,432.84	WM-MH4	3,430.80	345.00	0.670	10 inch	57.9	1.089	0.418
WM-P5	WM-MH4	3,430.80	WM-MH5	3,429.88	170.00	0.682	10 inch	58.7	1.042	0.360
WM-P6	WM-MH5	3,429.88	WM-MH6	3,427.92	340.00	0.693	10 inch	58.7	1.075	0.383
WM-P7	WM-MH6	3,427.92	WM-MH7	3,425.96	340.00	0.704	10 inch	61.9	1.075	0.371
WM-P8	WM-MH7	3,425.96	MT-MH27	3,424.35	360.00	0.715	10 inch	66.6	0.947	0.232
WS-P1	WS-MH2	3,467.81	WS-MH1	3,465.30	233.41	3.064	12 inch	664.8	2.388	-0.677
WS-P2	WS-MH3	3,470.30	WS-MH2	3,467.81	231.00	3.064	12 inch	826.1	2.391	-0.674
WS-P3	WS-MH4	3,472.79	WS-MH3	3,470.30	249.00	3.064	12 inch	934.0	2.303	-0.762
WS-P4	WS-MH5	3,475.28	WS-MH4	3,472.79	231.00	3.064	12 inch	728.1	2.391	-0.674
WS-P5	WS-MH6	3,479.44	WS-MH5	3,475.38	249.00	3.064	12 inch	815.6	2.940	-0.124
WS-P6	WS-MH7	3,482.03	WS-MH6	3,479.44	249.00	3.064	12 inch	924.1	2.348	-0.716
WS-P7	WS-MH8	3,484.53	WS-MH7	3,482.03	249.94	2.729	12 inch	1,010.6	2.303	-0.427
WS-P8	WS-MH9	3,487.48	WS-MH8	3,484.63	231.94	2.729	12 inch	671.4	2.552	-0.177
WS-P9	WS-MH10	3,490.34	WS-MH9	3,487.48	249.94	2.729	12 inch	724.5	2.463	-0.266
WS-P10	WS-MH11	3,492.22	WS-MH10	3,490.44	249.94	2.729	12 inch	833.7	1.943	-0.786
WS-P11	WS-MH12	3,494.04	WS-MH11	3,492.22	249.94	2.729	12 inch	985.6	1.965	-0.764
WS-P12	WS-MH13	3,495.96	WS-MH12	3,494.04	249.94	2.729	12 inch	1,149.8	2.018	-0.711
WS-P13	WS-MH14	3,497.72	WS-MH13	3,495.96	231.94	2.729	12 inch	762.9	2.006	-0.724
WS-P14	WS-MH15	3,499.54	WS-MH14	3,497.72	249.94	2.729	12 inch	922.5	1.965	-0.764
WS-P15	WS-MH16	3,501.12	WS-MH15	3,499.54	231.94	2.729	12 inch	713.9	1.900	-0.829
WS-P16	WS-MH17	3,502.96	WS-MH16	3,501.12	249.94	2.729	8 inch	3,348.3	0.670	-2.059
WS-P17	WS-MH18	3,514.68	WS-MH17	3,503.66	500.00	2.729	12 inch	487.3	3.418	0.689
WS-P18	WS-MH19	3,525.66	WS-MH18	3,514.68	500.00	2.729	12 inch	187.1	3.412	0.683
WS-P19	WS-MH20	3,533.74	WS-MH19	3,525.76	500.00	2.729	12 inch	81.8	2.909	0.180
WSP20	WS-MH21	3,540.55	WS-MH20	3,533.74	424.40	2.729	12 inch	81.7	2.917	0.187
WT-OI-P	WT-OI-OVERFL	3,369.95	OI-MH1	3,369.79	30.00	0.000	15 inch	0.0	3.049	3.049
WT-P1	WT-MH1	3,397.50	WT-MH2	3,395.92	90.00	1.302	15 inch	39.1	5.532	4.229
WT-P2	WT-MH2	3,395.92	WT-MH3	3,394.02	189.24	1.302	15 inch	41.8	4.183	2.881
WT-P3	WT-MH3	3,394.02	WT-MH4	3,391.08	302.81	1.302	15 inch	42.0	4.114	2.811
WT-P4	WT-MH4	3,391.08	WT-MH5	3,386.23	500.00	1.302	15 inch	42.0	4.112	2.809
WT-P5	WT-MH5	3,386.23	WT-MH6	3,381.45	500.00	1.302	15 inch	42.0	4.082	2.780
WT-P6	WT-MH6	3,381.45	WT-MH7	3,376.63	500.00	1.302	15 inch	42.0	4.099	2.797
WT-P7	WT-MH7	3,376.63	WT-MH8	3,371.85	489.54	1.302	15 inch	41.9	4.125	2.823

Scenario: Future - Peak Flows

Gravity Pipe Report

Label	Upstream Node	Upstream Invert Elevation (ft)	Downstream Node	Downstream Invert Elevation (ft)	Length (ft)	Total Flow (mgd)	Section Size	d/D (Depth/Rise) (%)	Design Capacity (mgd)	Excess Full Capacity (mgd)
A-P1	A-MH1	3,319.42	A-MH2	3,318.89	136.27	2.0214	15 inch	413.7	2.6036	0.5822
A-P2	A-MH2	3,318.89	A-MH3	3,317.70	499.17	2.0263	15 inch	422.7	2.0384	0.0121
A-P3	A-MH3	3,317.70	A-MH4	3,316.13	426.90	2.0312	15 inch	445.6	2.5318	0.5006
A-P4	A-MH4	3,316.13	A-MH5	3,314.93	345.66	2.0361	15 inch	505.7	2.4598	0.4237
A-P5	A-MH5	3,314.93	A-MH6	3,313.80	401.57	2.0410	15 inch	527.6	2.2146	0.1736
A-P6	A-MH6	3,313.80	A-MH7	3,312.78	299.57	2.0459	15 inch	575.2	2.4361	0.3901
A-P7	A-MH7	3,312.78	A-MH8	3,313.11	34.83	2.5437	15 inch	600.6	-4.0637	-6.6074
A-P8	A-MH8	3,313.11	A-MH9	3,311.65	365.61	2.5485	15 inch	586.2	2.6382	0.0897
A-P9	A-MH9	3,311.65	A-MH10	3,310.53	399.84	2.5534	15 inch	575.0	2.2096	-0.3438
A-P10	A-MH10	3,310.53	A-MH11	3,309.60	299.71	2.5582	15 inch	578.8	2.3256	-0.2326
A-P11	A-MH11	3,309.60	A-MH12	3,307.86	629.50	2.9658	15 inch	513.5	2.1949	-0.7709
A-P12	A-MH12	3,307.86	A-MH13	3,305.99	626.95	2.9705	15 inch	417.8	2.2801	-0.6905
A-P13	A-MH13	3,305.99	A-MH14	3,304.25	628.05	2.9753	15 inch	394.0	2.1974	-0.7779
A-P14	A-MH14	3,304.25	A-MH15	3,302.47	630.87	2.9801	15 inch	341.4	2.2176	-0.7625
A-P15	A-MH15	3,302.47	A-MH16	3,301.79	242.94	2.9848	15 inch	380.1	2.2087	-0.7761
A-P16	A-MH16	3,301.79	A-MH17	3,300.75	383.11	2.9896	15 inch	384.8	2.1752	-0.8144
A-P17	A-MH17	3,300.75	A-MH18	3,299.00	627.66	2.9943	15 inch	288.6	2.2044	-0.7899
A-P18	A-MH18	3,299.00	A-MH19	3,297.23	630.84	2.9991	15 inch	170.1	2.2114	-0.7877
A-P19	A-MH19	3,297.23	A-MH20	3,295.53	234.33	3.0038	15 inch	130.1	3.5559	0.5521
A-P20	A-MH20	3,295.53	A-MH21	3,294.00	421.16	3.0086	15 inch	123.3	2.5163	-0.4923
A-P21	A-MH21	3,294.00	A-MH22	3,293.20	52.00	3.0134	16 inch	114.8	6.1507	3.1374
A-P22	A-MH22	3,293.20	A-MH23	3,292.92	198.25	3.0181	16 inch	121.7	1.8636	-1.1545
A-P23	A-MH23	3,292.92	A-MH24	3,291.77	389.75	3.0229	16 inch	93.5	2.6936	-0.3292
A-P24	A-MH24	3,291.77	A-MH25	3,289.47	200.00	3.0276	16 inch	57.4	5.3178	2.2902
A-P25	A-MH25	3,289.47	A-MH26	3,286.67	350.25	3.0324	16 inch	60.7	4.4338	1.4014
A-P26	A-MH26	3,286.67	A-MH27 (MMH	3,284.22	306.00	3.0371	16 inch	63.9	4.4372	1.4001
A-P27	A-MH27 (MMH6)	3,284.22	A-MH28	3,281.61	434.00	3.0419	16 inch	67.6	3.8456	0.8037
A-P28	A-MH28	3,281.61	A-MH29	3,279.43	376.00	3.0419	16 inch	68.0	3.7759	0.7340
A-P29	A-MH29	3,279.43	A-MH30	3,273.98	240.00	3.0419	12 inch	109.4	3.4698	0.4279
A-P30	A-MH30	3,273.98	A-MH31	3,271.60	280.00	3.0419	15 inch	152.7	3.8490	0.8071
A-P31	A-MH31	3,271.60	A-MH32	3,264.28	500.00	3.0419	12 inch	165.3	2.7860	-0.2558
A-P32	A-MH32	3,264.28	A-MH33	3,260.51	475.00	3.0419	15 inch	70.9	3.7193	0.6775
A-P33	A-MH33	3,260.51	A-MH34	3,257.15	495.00	3.0419	15 inch	73.1	3.4396	0.3977
A-P34	A-MH34	3,257.15	A-MH35	3,253.84	460.00	3.0419	15 inch	76.3	3.5414	0.4995
A-P35	A-MH35	3,253.84	A-MH36	3,251.41	450.00	3.0419	15 inch	81.2	3.0679	0.0260
A-P36	A-MH36	3,251.41	A-MH37	3,248.62	450.00	3.0419	15 inch	91.9	3.2873	0.2454
A-P37	A-MH37	3,248.62	A-MH38	3,240.61	450.00	3.0419	12 inch	142.6	3.0720	0.0301
A-P38	A-MH38	3,240.61	A-MH39	3,240.10	422.00	3.0419	18 inch	89.0	2.3600	-0.6818
A-P39	A-MH39	3,240.10	O-1	3,238.61	572.00	3.0419	18 inch	72.7	3.4649	0.4230

Appendix F:

Basis of Costs

City of Kingman
Trunk Sewer Master Plan

Parallel Sewer Cost Basis

		Quantity	Units	Unit Price	Total
Airway West Trunk					
	Depth				
8 inch					
	< 6 feet	1,262	LF	$18.65	$23,536
	6-8 feet	1,646	LF	$22.65	$37,282
10 inch					
	< 6 feet	1,026	LF	$22.80	$23,393
	6-8 feet	350	LF	$26.70	$9,345
Manholes					
	< 6 feet	8	EA	$1,750	$14,000
	6-8 feet	7	EA	$2,000	$14,000
Pavement Replacement		1,950	SY	$15.00	$29,250
Estimated Construction Cost					$150,806
Contingencies incl: Administration, Legal and Engineering (25%)					$37,702
Total					**$188,508**

Kino Trunk					
	Depth				
8 inch					
	< 6 feet	200	LF	$18.65	$3,730
10 inch					
	< 6 feet	400	LF	$22.80	$9,120
Manholes					
	< 6 feet	4	EA	$1,750	$7,000
Pavement Replacement		275	SY	$15.00	$4,125
Estimated Costruction Cost					$23,975
Contingencies incl: Administration, Legal and Engineering (25%)					$5,994
Total					**$29,969**

City of Kingman
Trunk Sewer Master Plan

Parallel Sewer Cost Basis

		Quantity	Units	Unit Price	Total
Harrison Street Trunk					
	Depth				
8 inch					
	< 6 feet	727	LF	$18.65	$13,559
	6-8 feet	1,156	LF	$22.65	$26,183
	8-10 feet	828	LF	$29.20	$24,178
	10-12 feet	1,100	LF	$37.25	$40,975
12 inch					
	< 6 feet	359	LF	$26.60	$9,549
Manholes					
	< 6 feet	4	EA	$1,750	$7,000
	8-10 feet	5	EA	$2,250	$11,250
	10-12 feet	3	EA	$2,500	$7,500
	12-14 feet	4	EA	$2,750	$11,000
Pavement Replacement		1,900	SY	$15.00	$28,500
Estimated Construction Cost					$179,694
Contingencies incl: Administration, Legal and Engineering (25%)					$44,923
Total					**$224,617**

Fairgrounds Trunk					
	Depth				
8 inch					
	< 6 feet	6,140	LF	$18.65	$114,511
	6-8 feet	1,336	LF	$22.65	$30,260
	8-10 feet	44	LF	$29.20	$1,285
Manholes					
	< 6 feet	26	EA	$1,750	$45,500
	6-8 feet	5	EA	$2,000	$10,000
	8-10 feet	1	EA	$2,250	$2,250
Pavement Replacement		3,350	SY	$15.00	$50,250
Estimated Construction Cost					$254,056
Contingencies incl: Administration, Legal and Engineering (25%)					$63,514
Total					**$317,570**

City of Kingman
Trunk Sewer Master Plan

Parallel Sewer Cost Basis

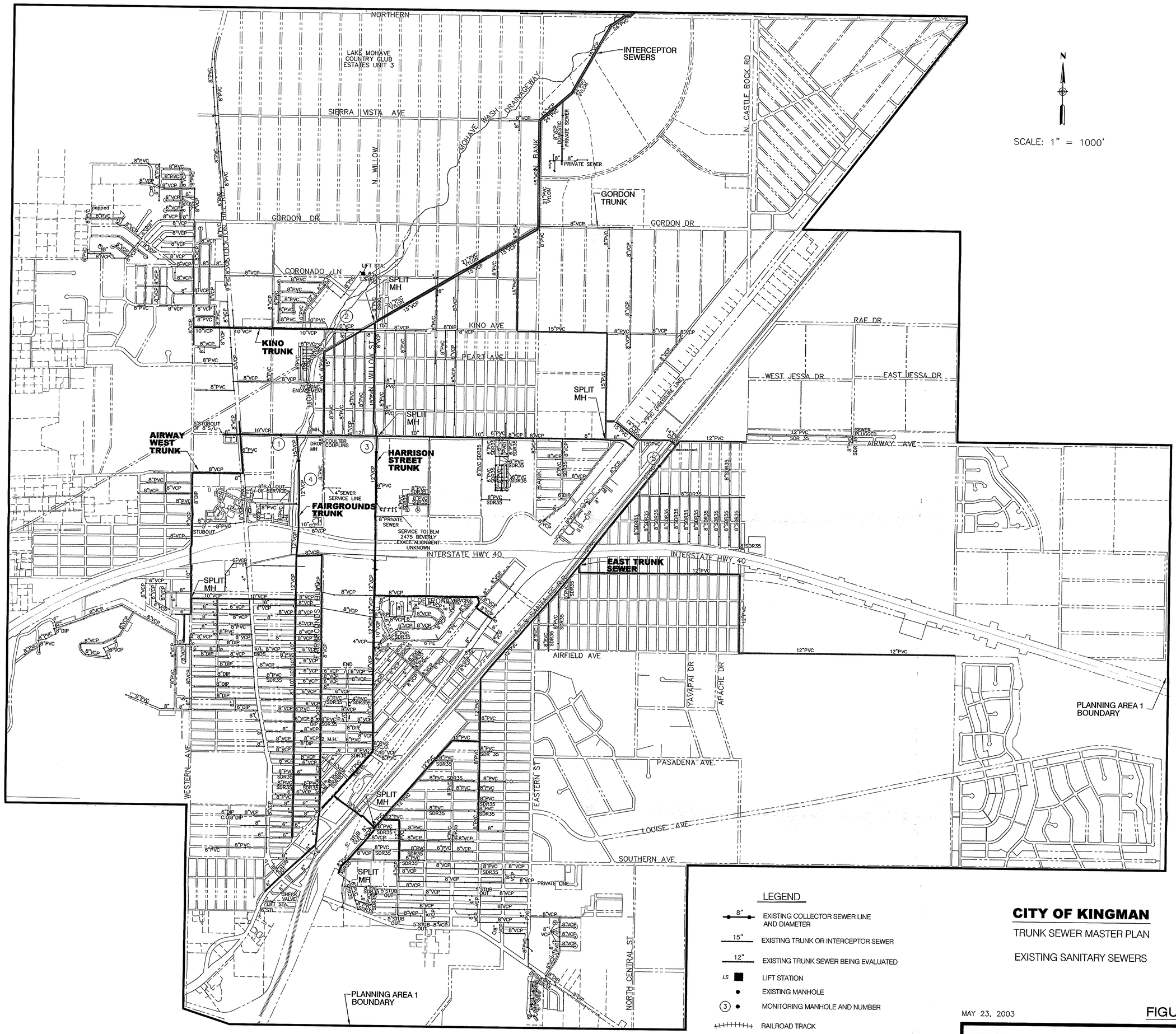
		Quantity	Units	Unit Price	Total
East Trunk					
	Depth				
8 inch					
	< 6 feet	2,217	LF	$18.65	$41,347
	6-8 feet	2,037	LF	$22.65	$46,138
	8-10 feet	1,555	LF	$29.20	$45,406
	10-12 feet	979	LF	$35.20	$34,461
	12-14 feet	1,083	LF	$46.75	$50,630
	14-16 feet	250	LF	$58.75	$14,688
	16-18 feet	250	LF	$74.00	$18,500
10 inch					
	< 6 feet	232	LF	$22.80	$5,290
	6-8 feet	2,039	LF	$26.70	$54,441
	8-10 feet	2,249	LF	$31.50	$70,844
18 inch					
	6-8 feet	806	LF	$46.35	$37,358
	8-10 feet	1,206	LF	$57.15	$68,923
	10-12 feet	1,208	LF	$63.35	$76,527
Manholes					
	< 6 feet	11	EA	$1,750	$19,250
	6-8 feet	9	EA	$2,000	$18,000
	8-10 feet	18	EA	$2,250	$40,500
	10-12 feet	4	EA	$2,500	$10,000
	12-14 feet	4	EA	$2,750	$11,000
	14-16 feet	1	EA	$3,000	$3,000
	16-18 feet	2	EA	$3,250	$6,500
Pavement Replacement		7,583	SY	$15.00	$113,745
Estimated Construction Cost					$786,547
Contingencies incl: Administration, Legal and Engineering (25%)					$196,637
Total					**$983,184**

City of Kingman
Trunk Sewer Master Plan

Parallel Sewer Cost Basis

		Quantity	Units	Unit Price	Total
Airport Trunk					
	Depth				
8 inch					
	6-8 feet	700	LF	$22.65	$15,855
12 inch					
	< 6 feet	630	LF	$26.70	$16,821
	6-8 feet	5,265	LF	$26.70	$140,576
18 inch					
	6-8 feet	35	LF	$50.45	$1,766
Manholes					
	< 6 feet	6	EA	$1,750	$10,500
	6-8 feet	11	EA	$2,000	$22,000
Pavement Replacement		3,500	SY	$15.00	$52,500
Estimated Construction Cost					$207,517
Contingencies incl: Administration, Legal and Engineering (25%)					$51,879
Total					**$259,397**

Figures



CITY OF KINGMAN

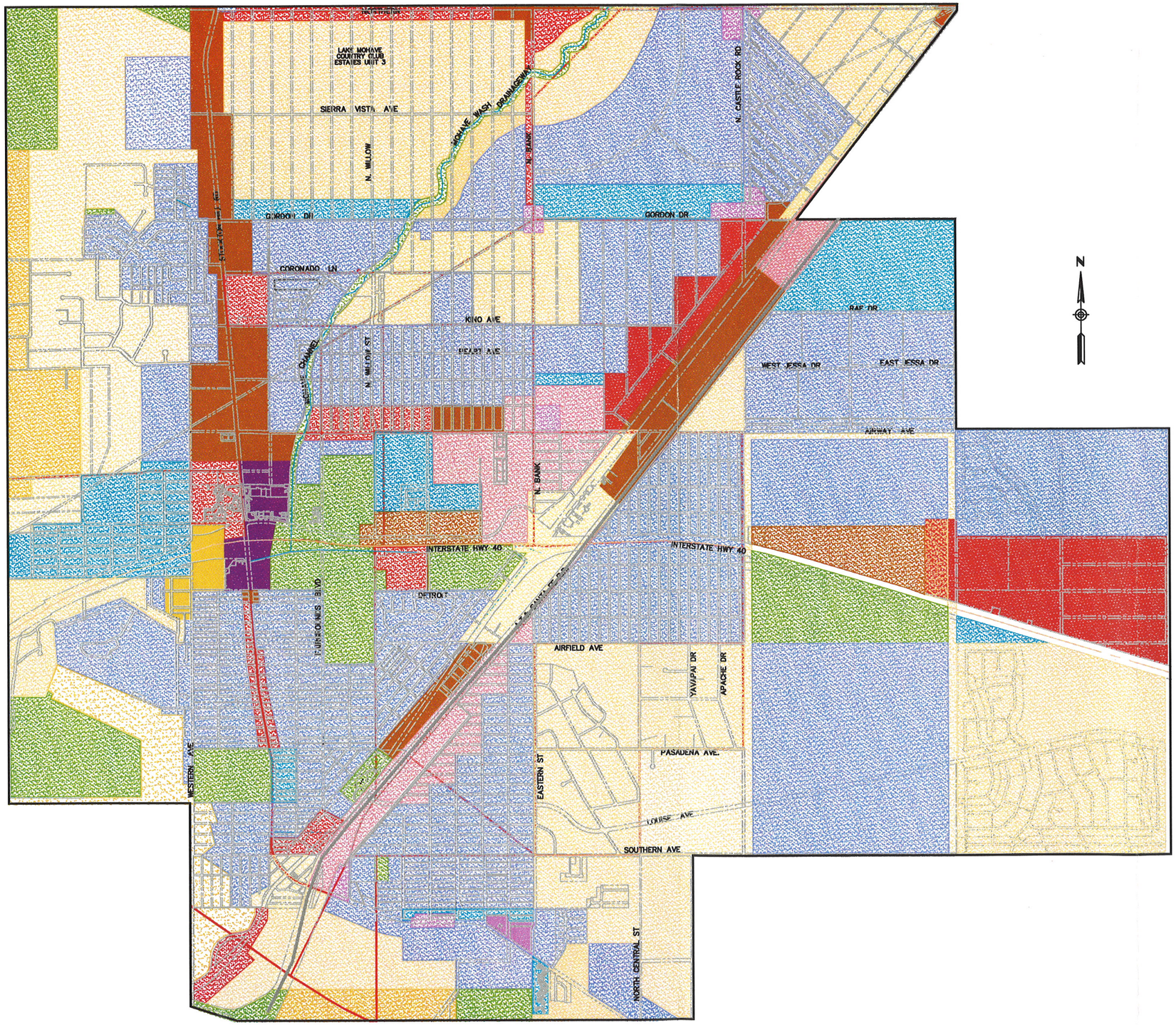
TRUNK SEWER MASTER PLAN

EXISTING SANITARY SEWERS

MAY 23, 2003

FIGURE 1

BURGESS & NIPLE



LAND USE LEGEND

RESIDENTIAL

- RURAL DENSITY
- LOW DENSITY
- MEDIUM DENSITY
- INTERMEDIATE DENSITY
- HIGH DENSITY

COMMERCIAL

- NEIGHBORHOOD
- MIXED-USE
- COMMUNITY
- REGIONAL
- HIGHWAY SERVICE

INDUSTRIAL

- LIGHT

RECREATIONAL

- OPEN SPACE

CITY OF KINGMAN

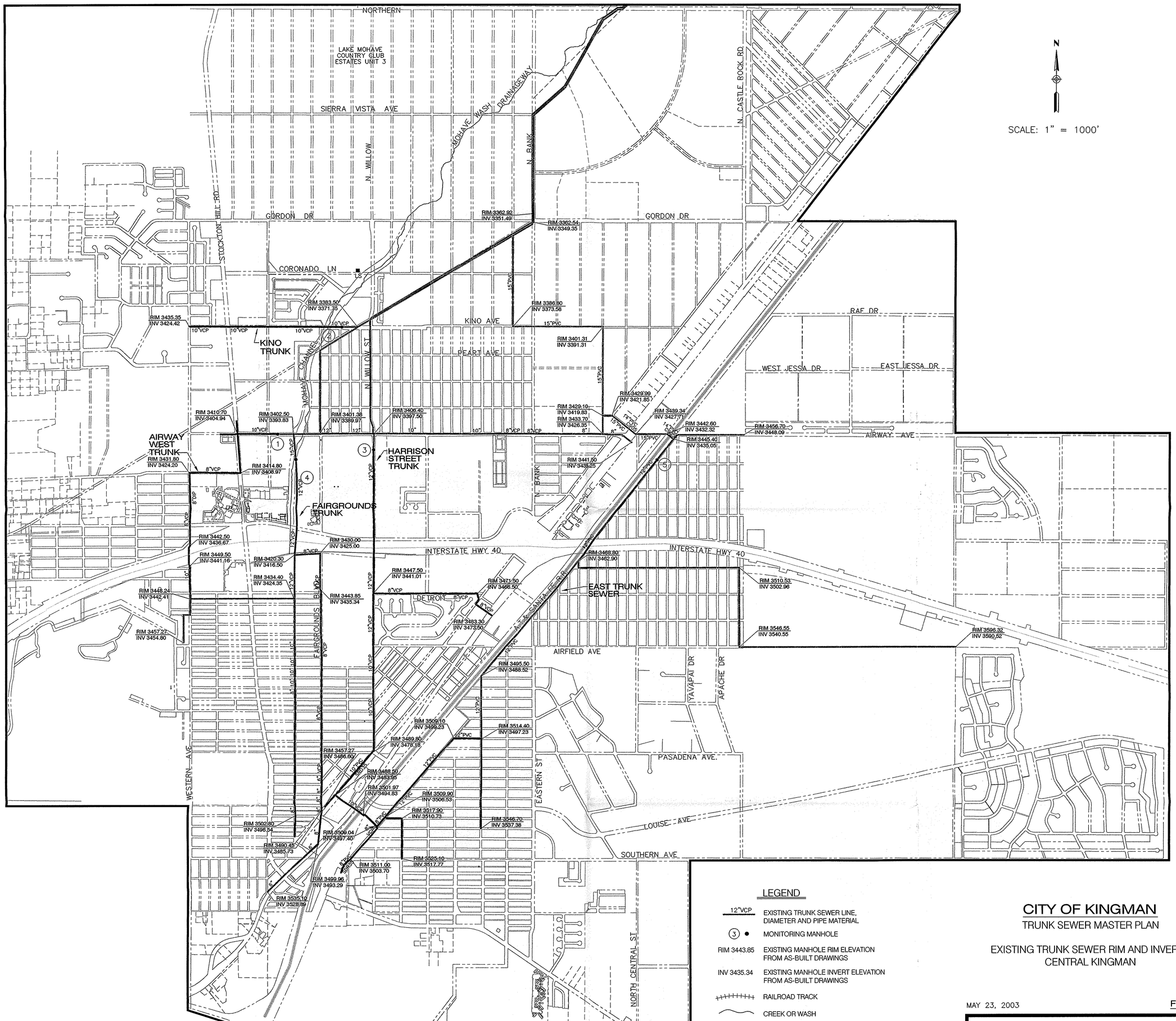
TRUNK SEWER MASTER PLAN

LAND USE PLAN

MAY 23, 2003

FIGURE 2

BURGESS & NIPLE



LEGEND

12"VCP	EXISTING TRUNK SEWER LINE, DIAMETER AND PIPE MATERIAL
(3) ●	MONITORING MANHOLE
RIM 3443.85	EXISTING MANHOLE RIM ELEVATION FROM AS-BUILT DRAWINGS
INV 3435.34	EXISTING MANHOLE INVERT ELEVATION FROM AS-BUILT DRAWINGS
	RAILROAD TRACK
	CREEK OR WASH

CITY OF KINGMAN

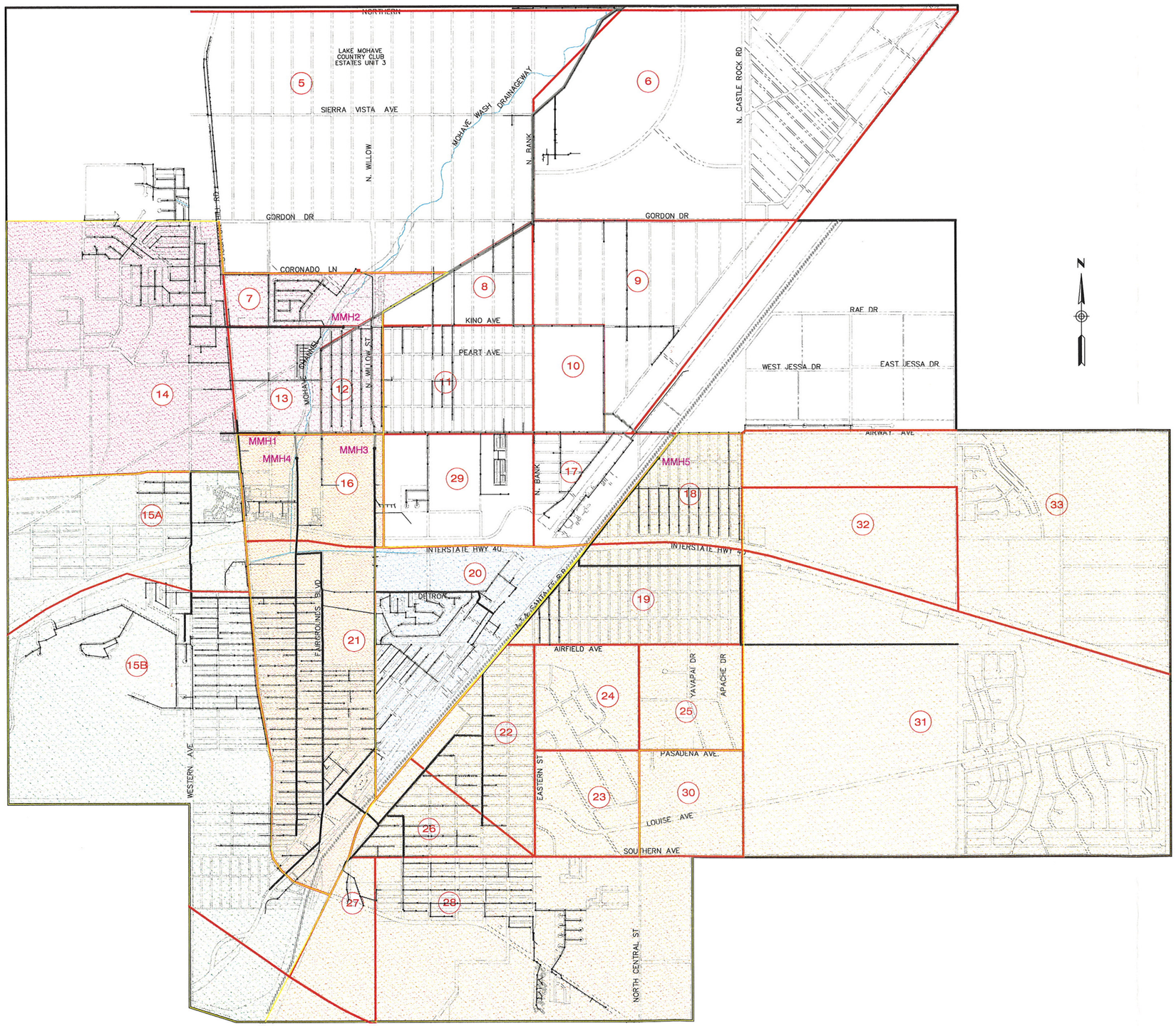
TRUNK SEWER MASTER PLAN

EXISTING TRUNK SEWER RIM AND INVERTS
CENTRAL KINGMAN

MAY 23, 2003

FIGURE 3

BURGESS & NIPLE



LEGEND

- 8 — SUB-BASIN NUMBER
- MMH — MONITORING MANHOLE
- RAILROAD TRACK
- CREEK OR WASH
- AIRWAY WEST TRUNK SEWER DRAINAGE BASIN
- EAST TRUNK SEWER DRAINAGE BASIN
- HARRISON TRUNK SEWER DRAINAGE BASIN
- KINO TRUNK SEWER DRAINAGE BASIN
- FAIRGROUNDS TRUNK SEWER DRAINAGE BASIN

CITY OF KINGMAN

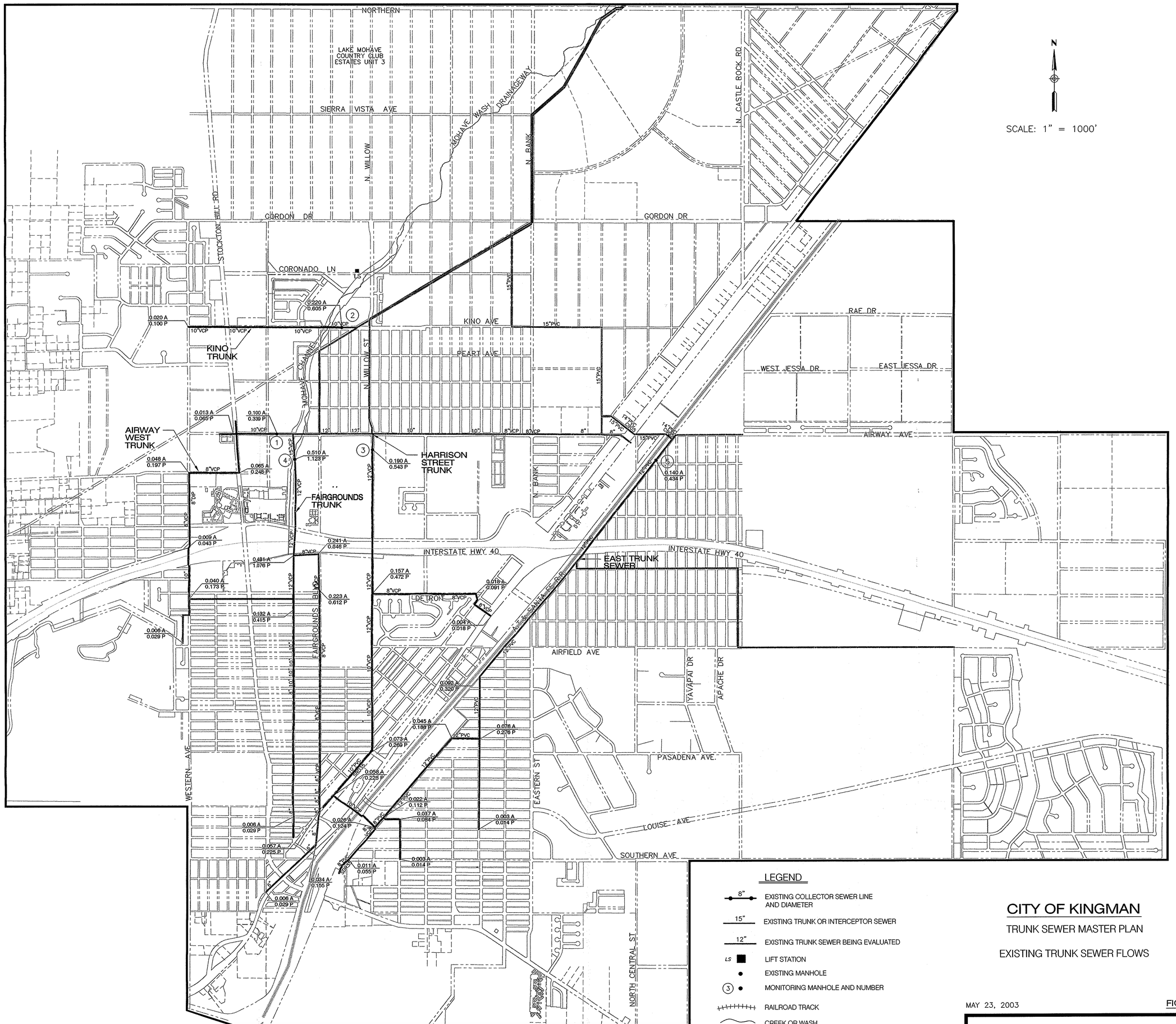
TRUNK SEWER MASTER PLAN

SERVICE AREAS

MAY 23, 2003

FIGURE 4

BURGESS & NIPLE



CITY OF KINGMAN

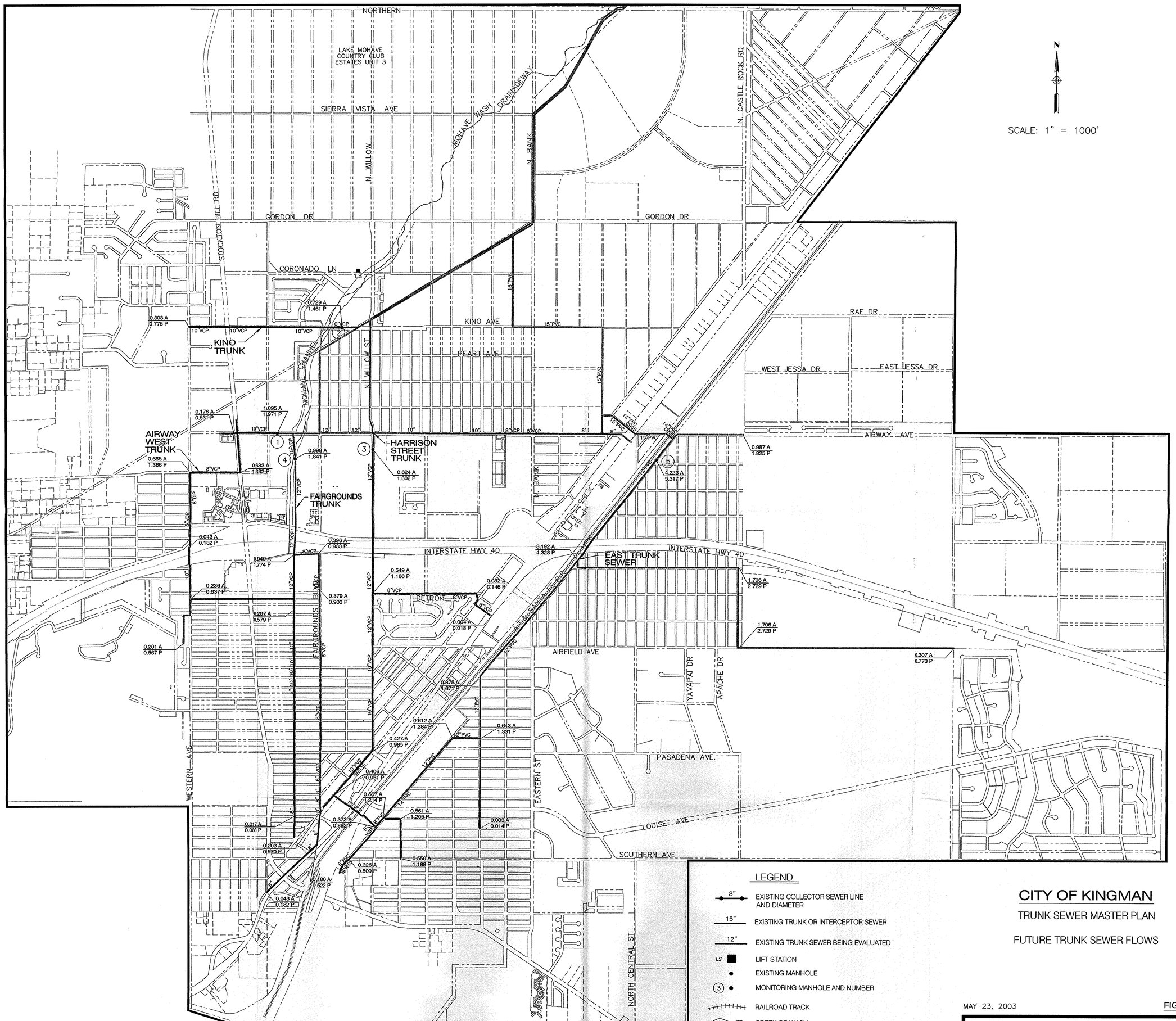
TRUNK SEWER MASTER PLAN

EXISTING TRUNK SEWER FLOWS

MAY 23, 2003

FIGURE 5A

BURGESS & NIPLE



CITY OF KINGMAN

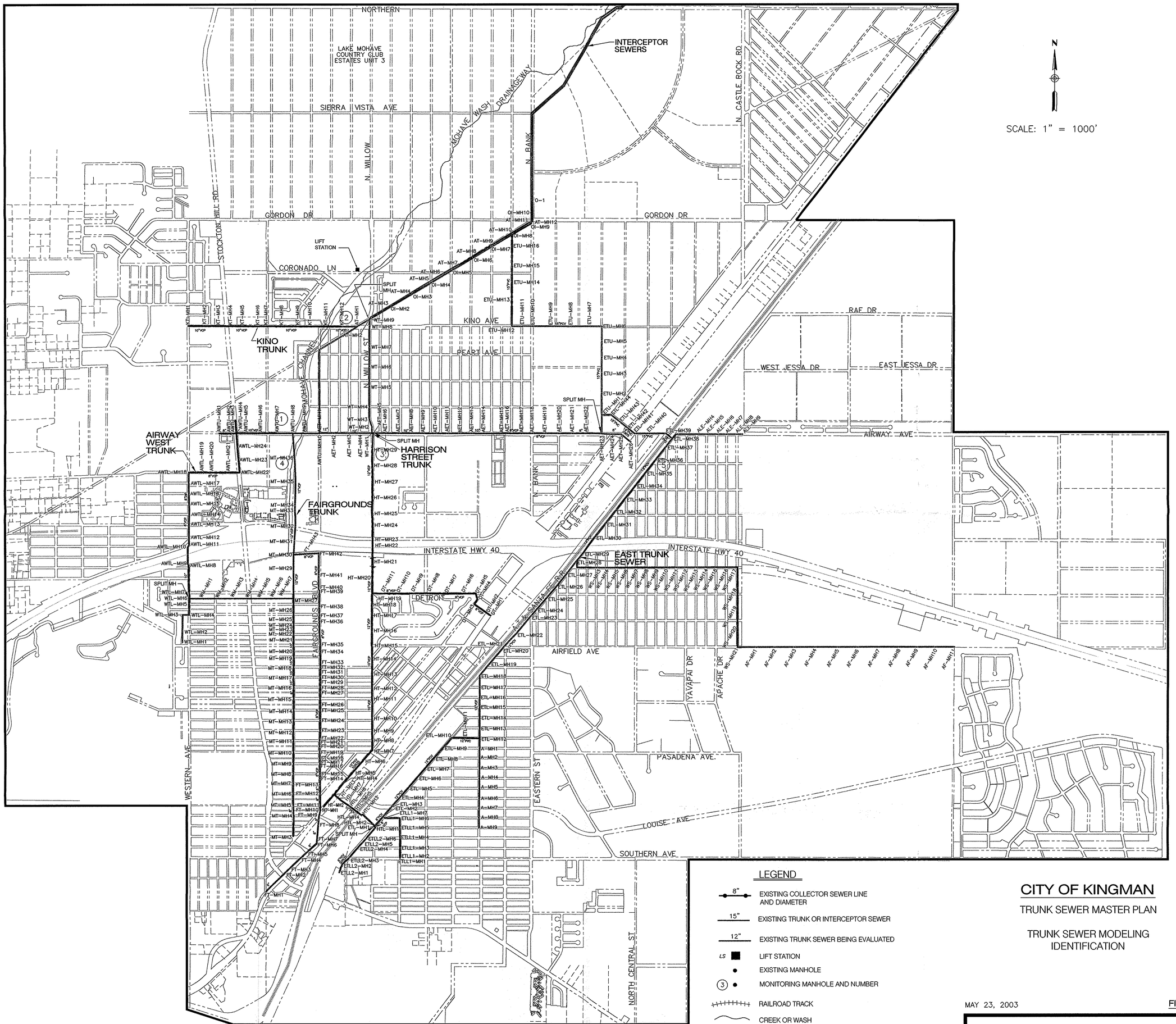
TRUNK SEWER MASTER PLAN

FUTURE TRUNK SEWER FLOWS

MAY 23, 2003

FIGURE 5B

BURGESS & NIPLE



LEGEND

- 8" — EXISTING COLLECTOR SEWER LINE AND DIAMETER
- 15" — EXISTING TRUNK OR INTERCEPTOR SEWER
- 12" — EXISTING TRUNK SEWER BEING EVALUATED
- LS — LIFT STATION
- EXISTING MANHOLE
- (3) — MONITORING MANHOLE AND NUMBER
- RAILROAD TRACK
- CREEK OR WASH

CITY OF KINGMAN

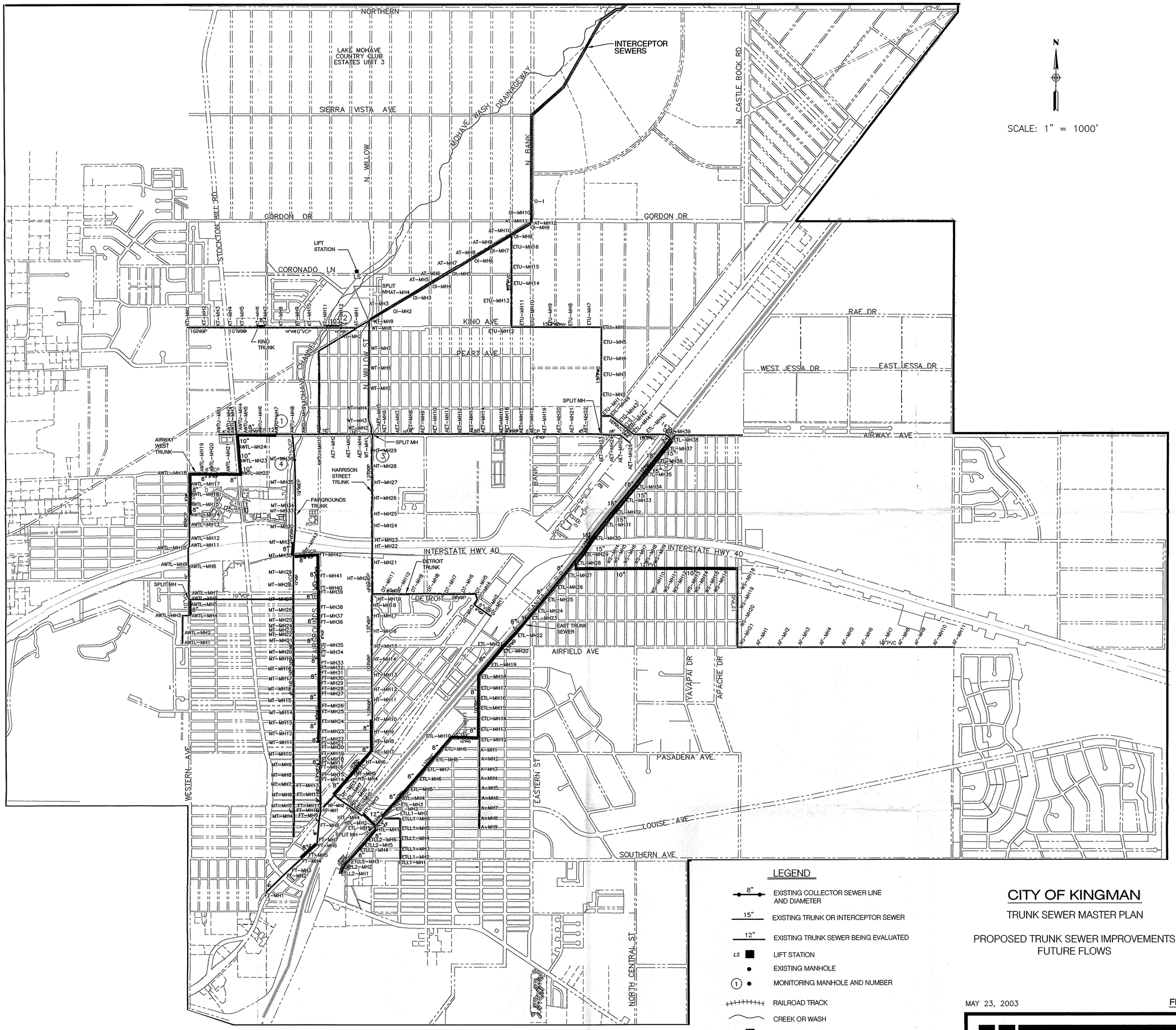
TRUNK SEWER MASTER PLAN

TRUNK SEWER MODELING IDENTIFICATION

MAY 23, 2003

FIGURE 6

BURGESS & NIPLE



LEGEND

- 8" — EXISTING COLLECTOR SEWER LINE AND DIAMETER
- 15" — EXISTING TRUNK OR INTERCEPTOR SEWER
- 12" — EXISTING TRUNK SEWER BEING EVALUATED
- LS — LIFT STATION
- EXISTING MANHOLE
- (1) — MONITORING MANHOLE AND NUMBER
- RAILROAD TRACK
- CREEK OR WASH
- AVERAGE FLOWS
- PEAK FLOWS

CITY OF KINGMAN

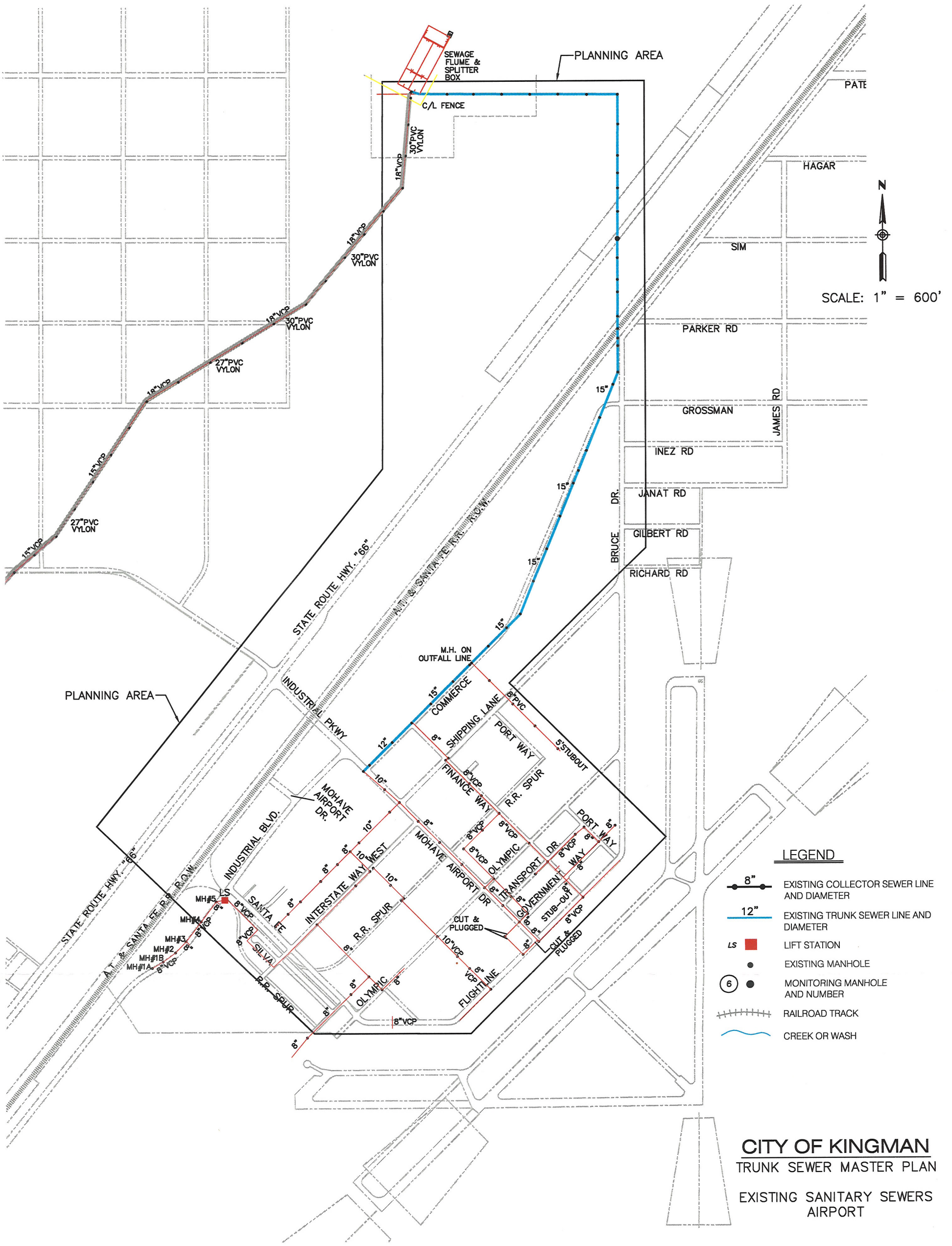
TRUNK SEWER MASTER PLAN

PROPOSED TRUNK SEWER IMPROVEMENTS
FUTURE FLOWS

MAY 23, 2003

FIGURE 7

BURGESS & NIPLE



CITY OF KINGMAN

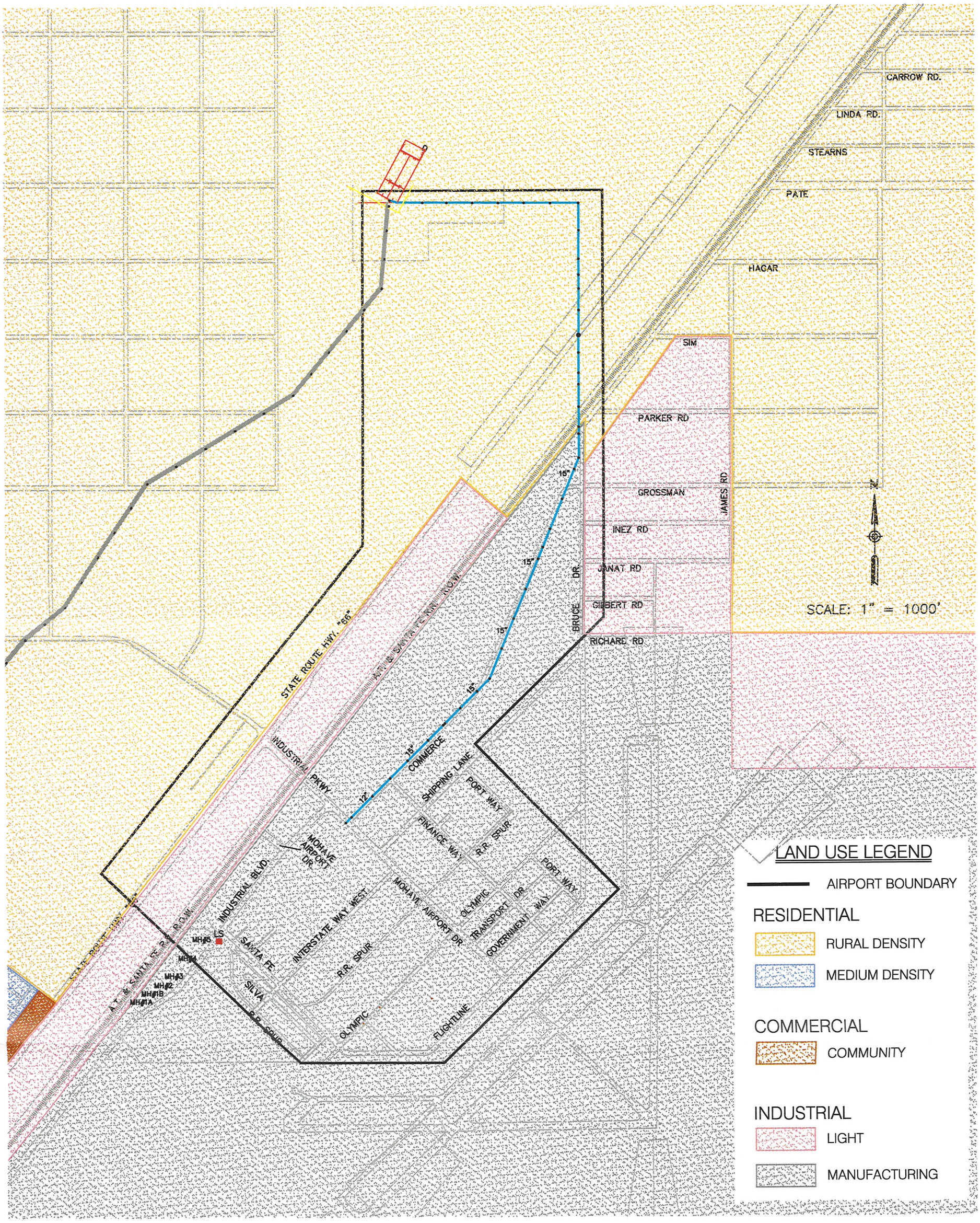
TRUNK SEWER MASTER PLAN

EXISTING SANITARY SEWERS AIRPORT

MAY 23, 2003

FIGURE 8

BURGESS & NIPLE



CITY OF KINGMAN

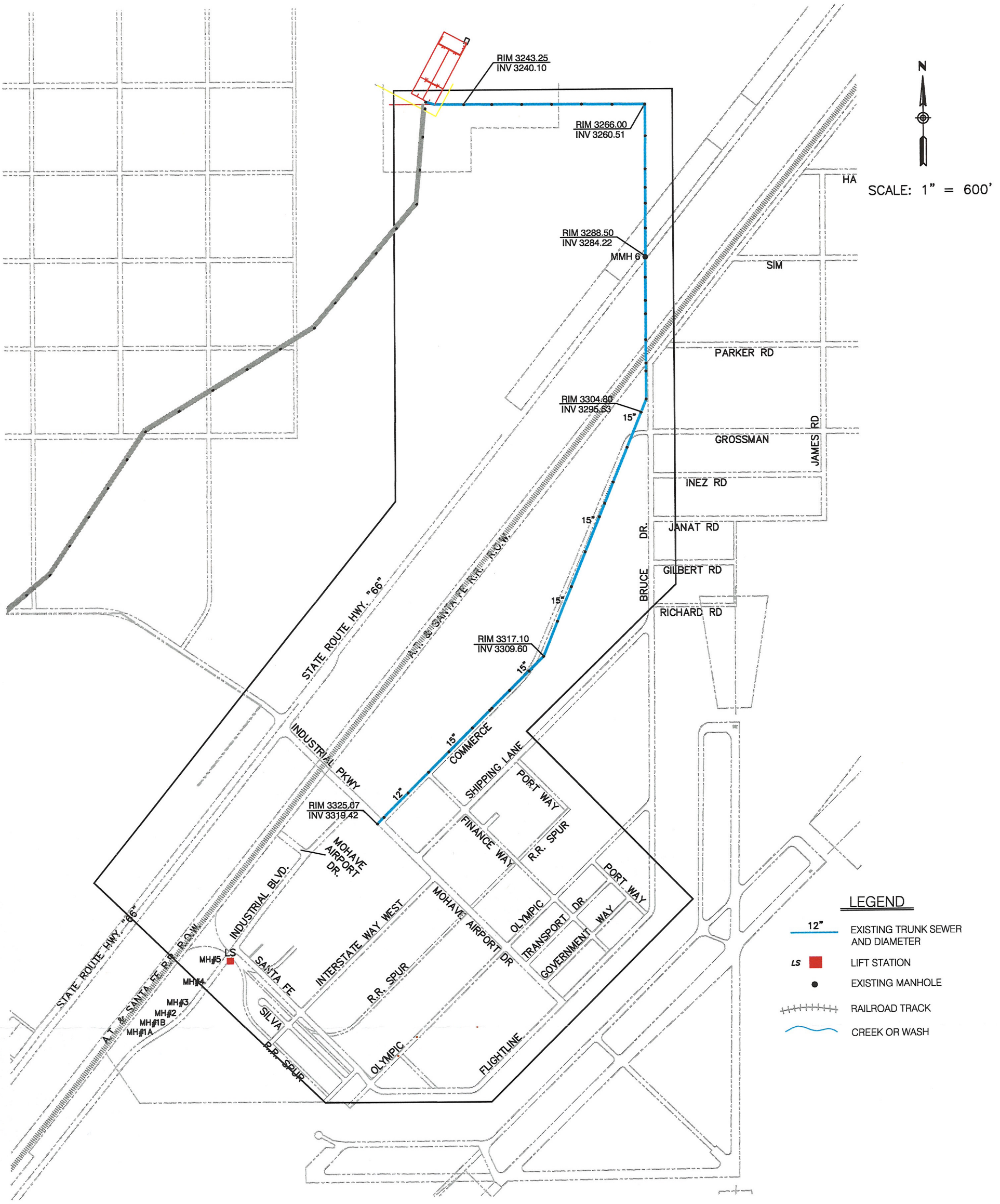
TRUNK SEWER MASTER PLAN

LAND USE PLAN
AIRPORT

MAY 23, 2003

FIGURE 9

BURGESS & NIPLE



CITY OF KINGMAN

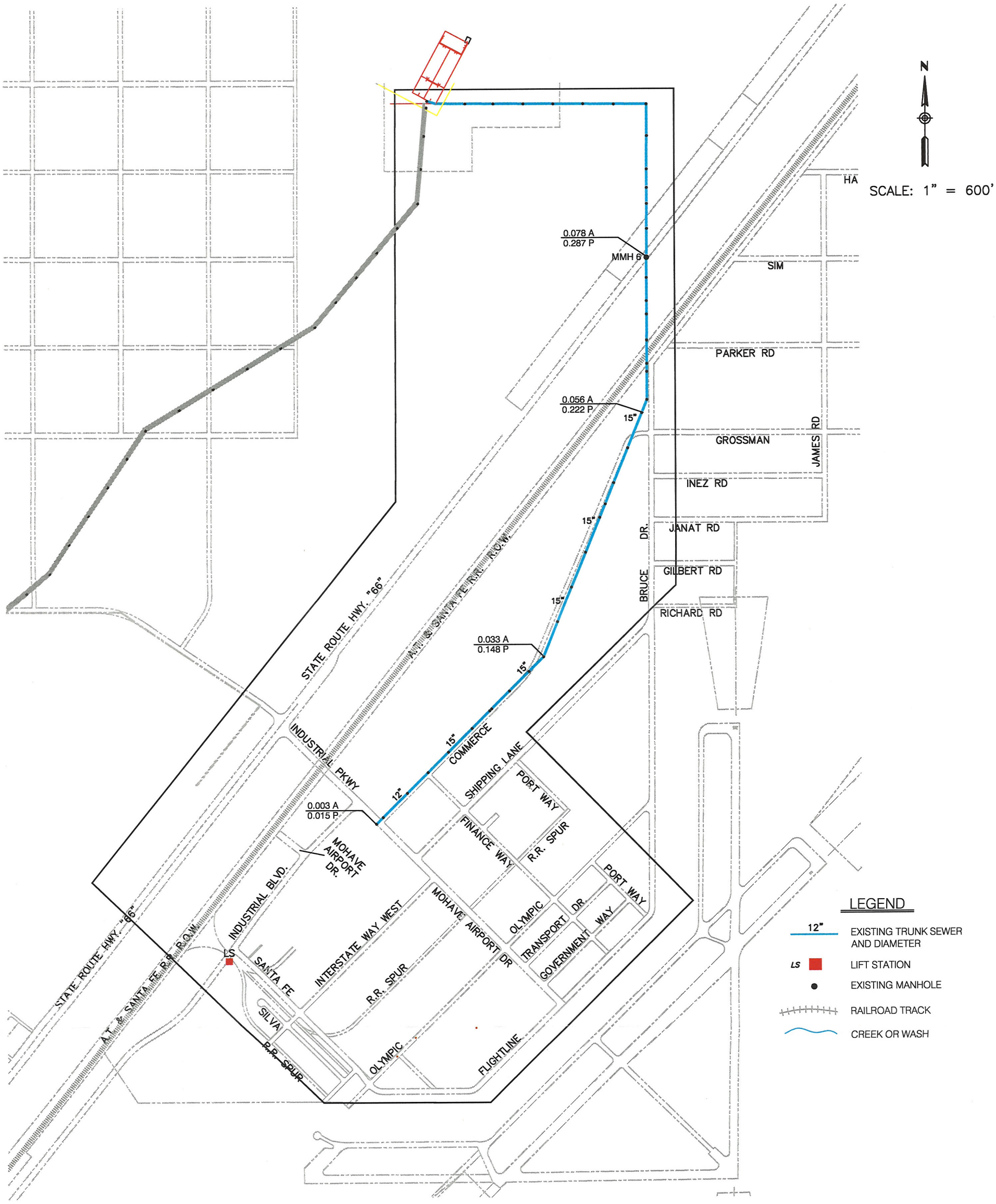
TRUNK SEWER MASTER PLAN

EXISTING TRUNK SEWER
RIM AND INVERTS
AIRPORT

MAY 23, 2003

FIGURE 10

BURGESS & NIPLE



CITY OF KINGMAN

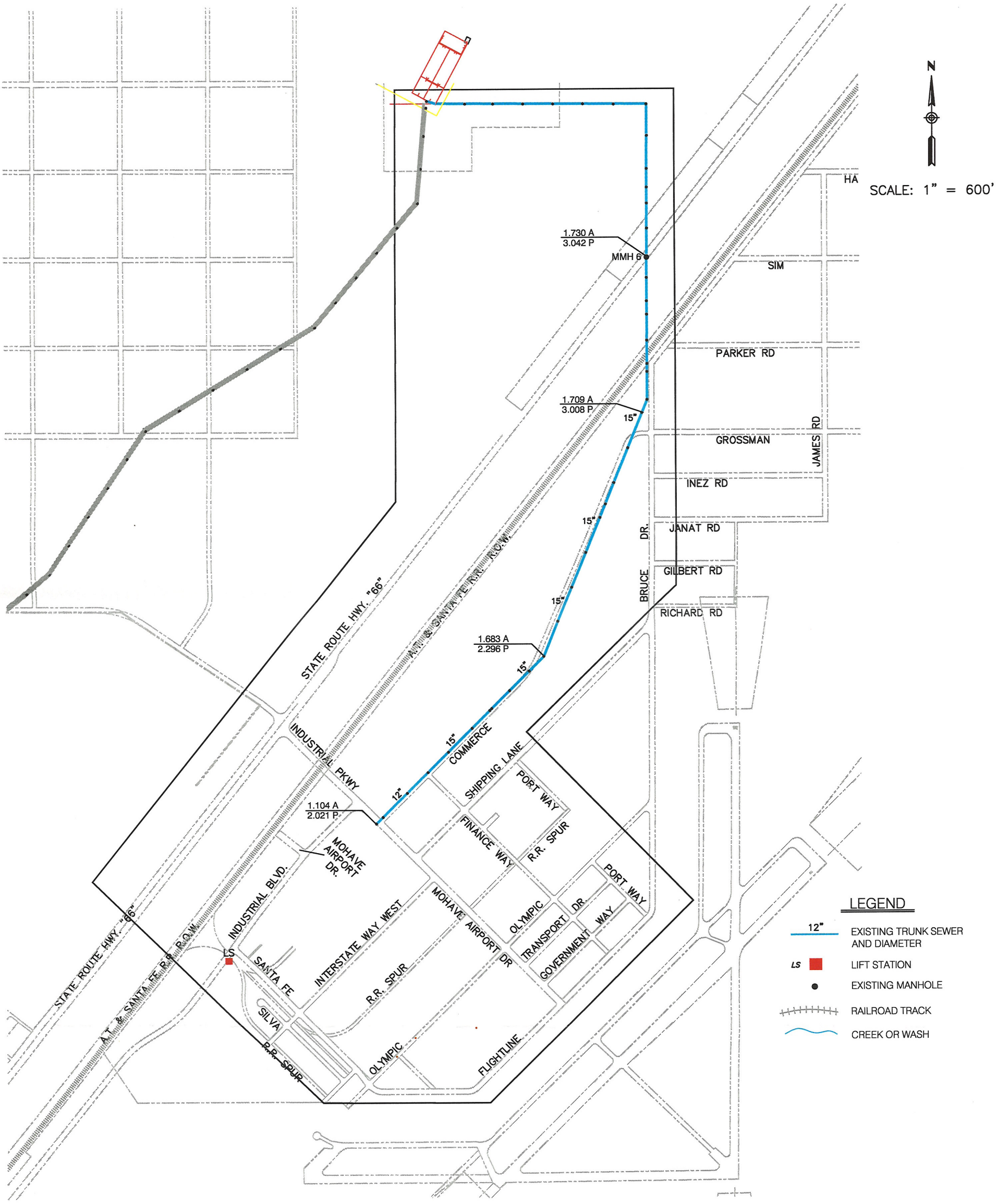
TRUNK SEWER MASTER PLAN

EXISTING TRUNK SEWER FLOWS

MAY 23, 2003

FIGURE 11A

BURGESS & NIPLE



CITY OF KINGMAN

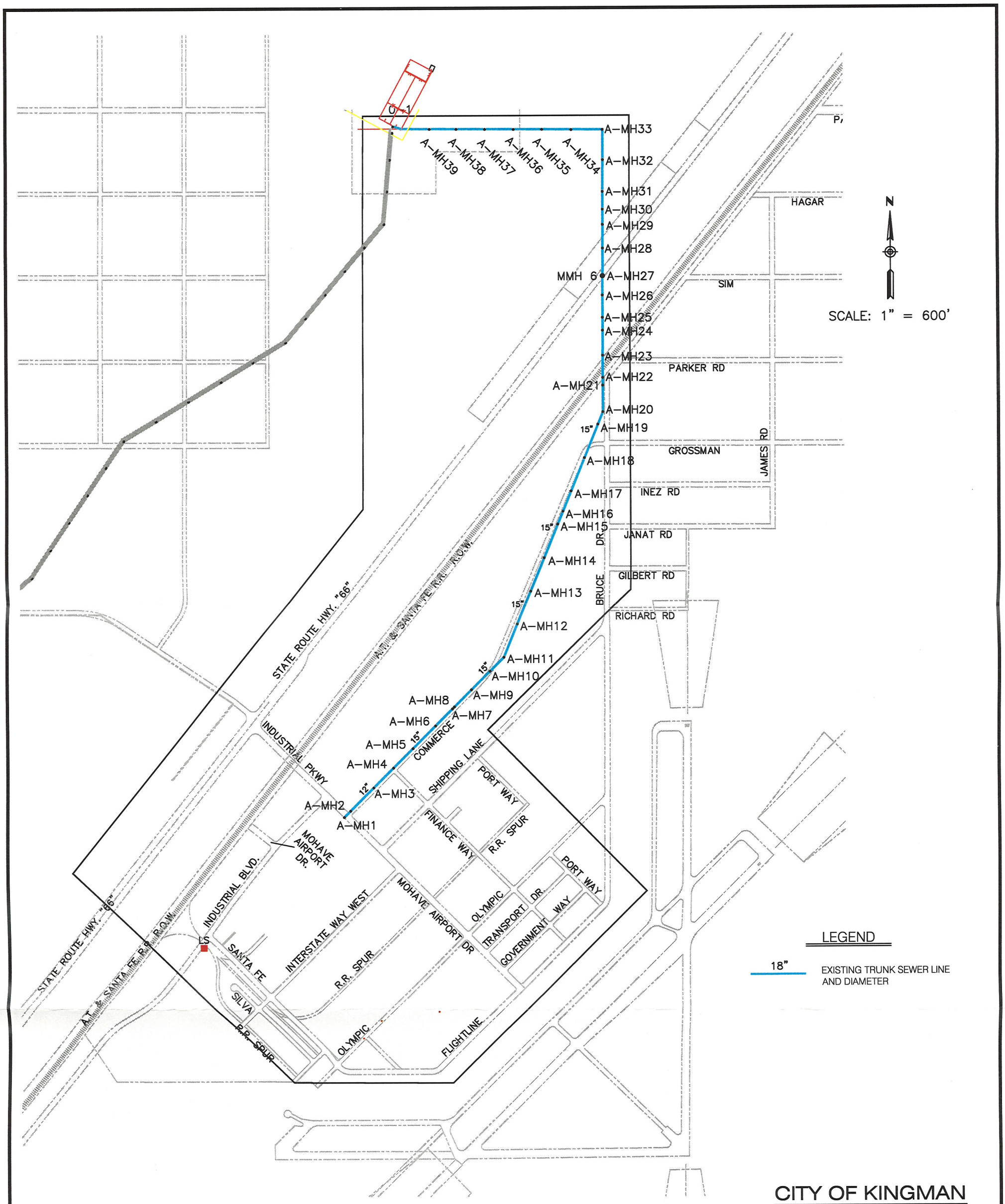
TRUNK SEWER MASTER PLAN

FUTURE TRUNK SEWER FLOWS

MAY 23, 2003

FIGURE 11B

BURGESS & NIPLE



CITY OF KINGMAN

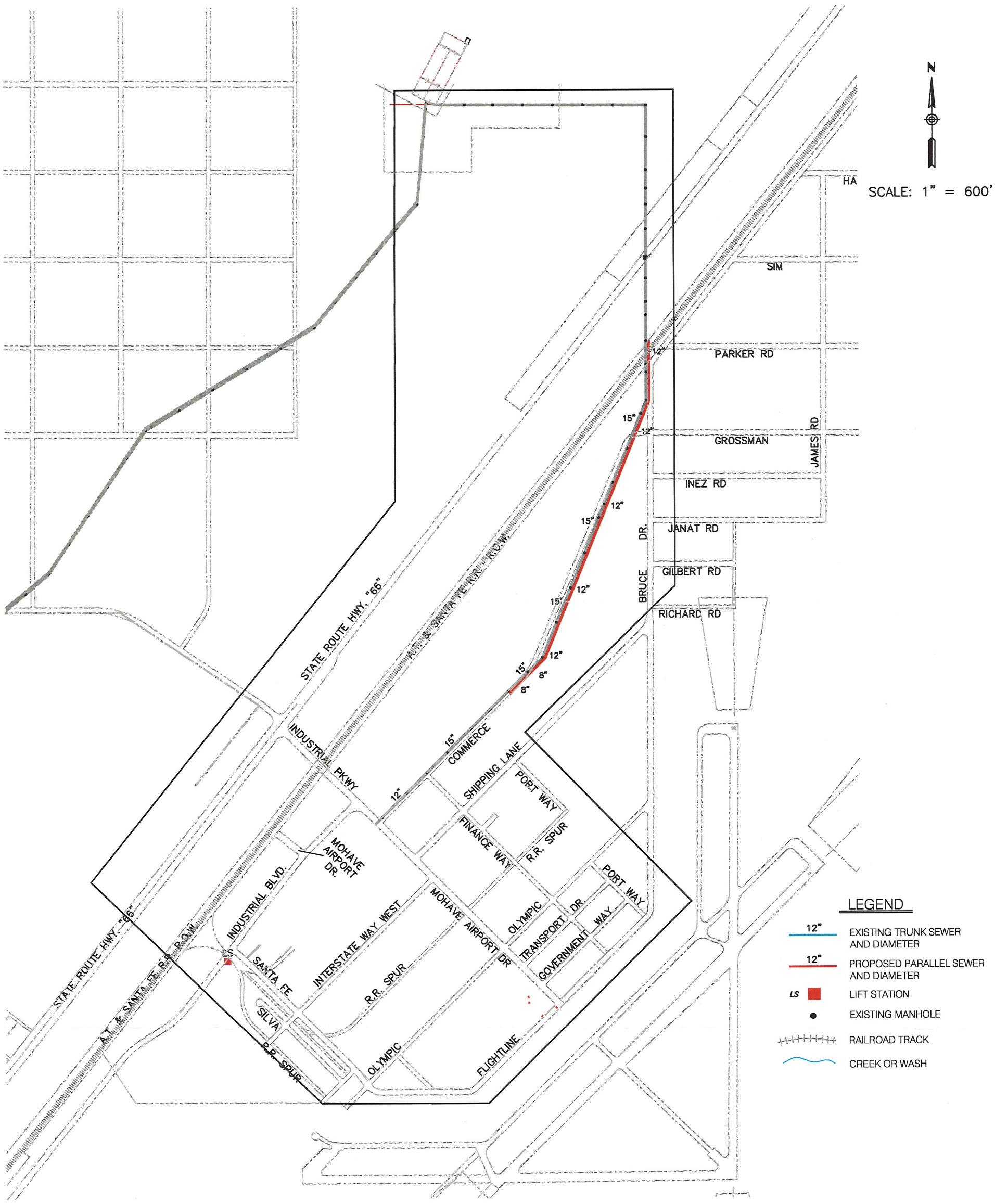
TRUNK SEWER MASTER PLAN

MODELING IDENTIFICATION
AIRPORT

MAY 23, 2003

FIGURE 12

BURGESS & NIPLE



CITY OF KINGMAN

TRUNK SEWER MASTER PLAN

PROPOSED TRUNK SEWER IMPROVEMENTS
FUTURE PEAK FLOW

MAY 23, 2003

FIGURE 13

BURGESS & NIPLE