CSA-71 SEWER
MASTER PLAN

County of Kern

November 2003
Rev. March 2004

Quad Knopf

Submitted to:

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CSA-71 SEWER
MASTER PLAN
(NORTHWEST BAKERSFIELD URBAN AREA)
COUNTY OF KERN

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- Donald Glover, North of River Sanitary District No. 1

in providing data and guidance for the preparation of this report.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

County Planned Sewer Area No. 71 (CSA-71) is a rapidly urbanizing area of approximately 73.3 square miles northwest of central Bakersfield. Approximately 13.5 square miles is within the corporate limits of the City of Bakersfield with the balance of the area as unincorporated County territory. Approximately 33.8 square miles of the northern portion of the area is within the boundaries of North of River Sanitary District No. 1 (NORSD). Approximately 6.8 square miles of the area is developed and sewered; 7.0 square miles is developed and served by on-site systems of which 1.5 square miles includes "dry sewers" in the streets.

The NORSD area has been sewer master-planned for service to a treatment plant to the west of CSA-71. That master plan is reviewed in this report and found to be appropriate. Service to development of the balance of the area, and service to its existing development, are analyzed herein. The formation of seven (7) 'benefit areas' to fund such service is proposed. Wastewater from all residential development in these service areas is proposed to flow through connections to existing major gravity trunk lines (the Allen Road and Buena Vista Road lines) to City of Bakersfield Plant No. 3 southwest of the City.

Funding of sewerage facilities must be obtained through utilization of benefit districts. Such funding should include consideration of the costs of pumped or gravity connections to existing sewer lines, capacity-related shared costs of existing trunk lines, costs of any required new gravity or pressure trunk lines and shared costs of treatment facilities. This report identifies seven (7) potential benefit areas of which five (5) benefit areas with associated costs per served equivalent dwelling unit ranging from $662 to $3,230. Such costs do not include residential sewer connections or in-street collector sewers where they do not now exist; it is assumed that such costs will be paid through local assessment district financing.

Design analyses, including modeling of sewer flows based upon General Plan buildout, and resulting needed sewer capacities, provided the basis for the CSA-71 Sewer Master Plan illustrated on Figure 1 on the following page. Also, odor control issues were addressed in a general fashion and included in Appendix D titled "Odor Control Issues."

CHAPTER 1- INTRODUCTION

SCALE: 1" = 5000'

5000 0' 5000

LEGEND

- CSA-71 BOUNDARY
- CITY LIMITS BAKERSFIELD
- CITY LIMITS SHAFTER
- RAILROAD
- CITY PLANNED SEWER AREA NO. 1
- CITY PLANNED SEWER AREA NO. 2
- CITY PLANNED SEWER AREA NO. 3
- CITY PLANNED SEWER AREA NO. 4
- CITY PLANNED SEWER AREA NO. 5
- N.O.R.S.D - COUNTY PLANNED SEWER AREA A AND B
- FM S.S. FORCE MAINS
- S.S. LIFT PUMP STATIONS
- EXISTING SEWER

COUNTY OF KERN
CSA-71
SEWER MASTER PLAN

FIGURE 1
SEWER MASTER PLAN

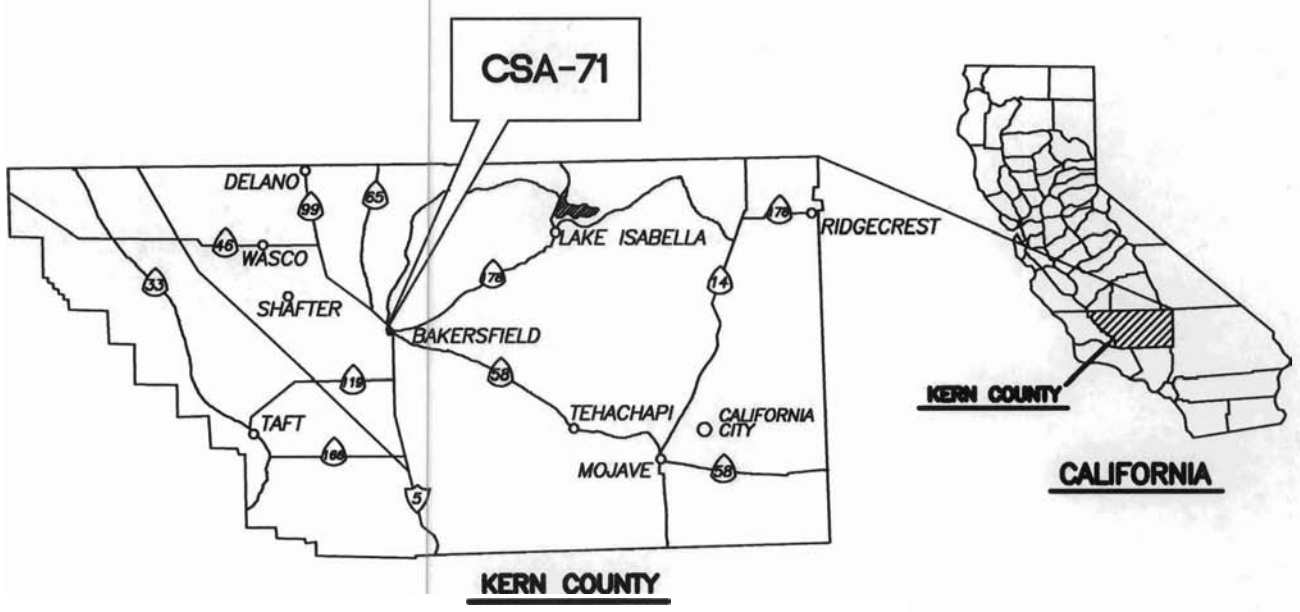
Quad Knopf

L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE1.dwg 3/17/2004 3:36:38 PM PST

CHAPTER 1 - INTRODUCTION

The County of Kern has authorized this study for sewerage of CSA-71, a County Planned Sewer Area encompassing approximately 73.4 square miles of urbanizing lands northwest of central Bakersfield. Figure 2 depicts the regional location of the area; Figure 3 shows CSA-71 boundary. The northern portion of the area is within the wastewater treatment service area, and District boundaries, of the North of River Sanitation District No. 1 (NORSD). The southern portion of the area is within the wastewater treatment service area of the City of Bakersfield's Treatment Plant No. 3; some of this service area is within Bakersfield's corporate limits and the balance is unincorporated County lands subject to wastewater treatment agreements with the City (see Figure 4).

There have been several previous studies addressing components of sewer master planning for CSA-71: a January, 1997 Carollo Engineers/City of Bakersfield study of the Allen Road/Buena Vista Road trunklines connecting the Area to City Treatment Plant No. 3; a February, 2002 Boyle Engineering/NORSD study of proposed sewer alignments to serve the NORSD portion of the area; a March, 2002 study by the County's Engineering and Survey Services Department recommending a Planned Sewer Area for a major section (2895 acres) of the CSA-71 Area.



NOT TO SCALE

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COUNTY OF KERN
CSA-71 SEWER MASTER PLAN
FIGURE 2
REGIONAL LOCATION

L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE2.dwg 3/17/2004 3:38:15 PM PST

SCALE: 1"= 5000'

5000 0' 5000

AERIAL PHOTO DATE 10-2000

LEGEND

- CSA-71 BOUNDARY
- CITY LIMITS BAKERSFIELD
- CITY LIMITS SHAFTER
- RAILROAD

COUNTY OF KERN
CSA-71
SEWER MASTER PLAN

FIGURE 3
COUNTY SERVICE AREA BOUNDARY

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L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE3.dwg 3/17/2004 3:45:11 PM PST

SCALE: 1"= 5000'

5000 0' 5000

LEGEND

- CSA-71 BOUNDARY
- CITY LIMITS BAKERSFIELD
- CITY LIMITS SHAFTER
- RAILROAD
- CITY SERVICE AREA
- NORSD SERVICE AREA

SEVENTH STANDARD RD.
ZERKER RD.
FRIANT-KERN CANAL
CALLOWAY CANAL
BEARDSLEY CANAL
SANTA FE WAY
SNOW RD.
KRATZMEYER RD.
NORRIS RD.
OLIVE DR.
SULLIVAN RD.
SUPERIOR RD.
GREELEY RD.
NORD AVE
HEATH RD.
RENFRO RD.
ALLEN RD.
JEWETTA AVE.
CALLOWAY DR.
HAGEMAN RD.
RUDD AVE
MEACHAM RD.
FRUITVALE AVE
ROSEDALE HWY.
COFFEE RD.
MOHAWK ST.
JENKINS RD.
BRIMHALL RD.
DRIVER RD.
GOOSE LAKE SLOUGH
ENOS LN.
AREA NOT INCLUDED IN STUDY
STOCKDALE HWY.
FUTURE WESTSIDE PARKWAY
KERN RIVER
GATES CANAL
JAMES CANAL
PIONEER CANAL
BUENA VISTA RD.
T29S/R25E
T29S/R26E
T30S/R26E
43
58
99

COUNTY OF KERN
CSA-71
SEWER MASTER PLAN

FIGURE 4
SERVICE AREAS

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L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE4.dwg 3/17/2004 3:46:47 PM PST

SCALE: 1"= 5000'

5000 0' 5000

LEGEND

- CSA-71 BOUNDARY
- CITY LIMITS BAKERSFIELD
- CITY LIMITS SHAFTER
- RAILROAD
- CONTOUR LINE (USGS)
- 350 COUNTOUR LINE ELEVATION (USGS)

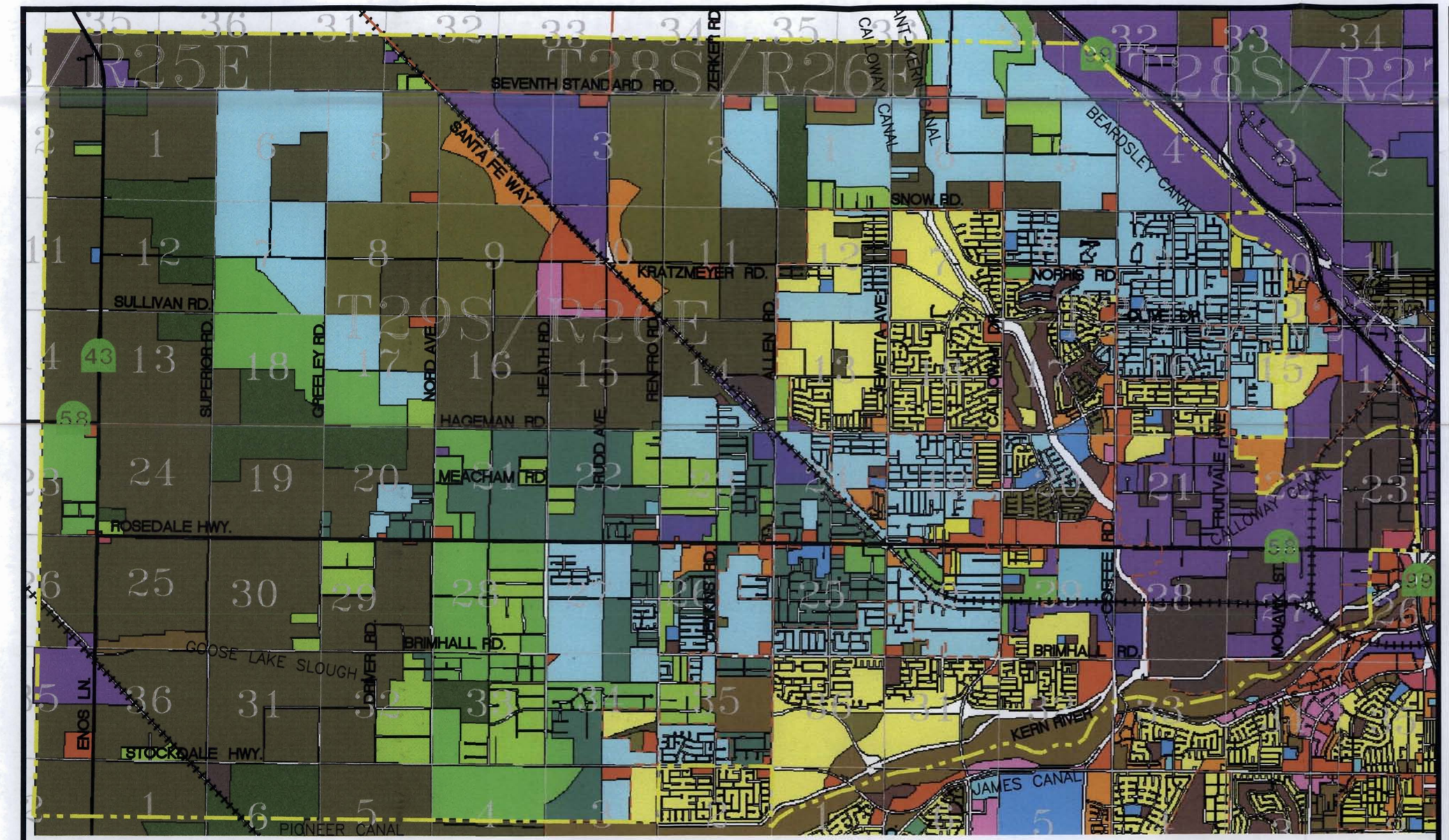
SEVENTH STANDARD RD.
ZERKER RD.
SANTA FE WAY
SNOW RD.
KRATZMEYER RD.
NORRIS RD.
SULLIVAN RD.
SUPERIOR RD.
GREELEY RD.
NORD AVE.
HEATH RD.
RENFRO RD.
ALLEN RD.
JEWETTA AVE.
CALLOWAY DR.
OLIVE DR.
HAGEMAN RD.
MEACHAM RD.
RUDD AVE
FRUITVALE AVE
ROSEDALE HWY.
COFFEE RD.
JENKINS RD.
MOHAWK ST.
BRIMHALL RD.
DRIVER RD.
ENOS LN.
KERN RIVER
STOCKDALE HWY.
BUENA VISTA RD.

COUNTY OF KERN
CSA-71
SEWER MASTER PLAN

FIGURE 5
STUDY AREA TOPOGRAPHY

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SCALE: 1"= 5000'

5000 0' 5000

UPDATED 12-2002

LEGEND

- CSA-71 BOUNDARY
- CITY LIMITS BAKERSFIELD
- CITY LIMITS SHAFTER
- RAILROAD

RESIDENTIAL

- RR
- ER
- UER
- SR
- SR/LR
- LR
- LMR/LR
- LMR
- HMR/LMR
- HMR
- HR

COMMERCIAL

- HC
- GC
- OC
- MC
- MUC

INDUSTRIAL

- LI
- SI
- HI

PUBLIC FACILITIES

- P
- PS
- PT
- P-SW
- LR/PS

OPEN SPACE

- OS
- OS-P
- OS-S

RESOURCE

- R-IA
- R-EA
- R-MP

COUNTY OF KERN
CSA-71
SEWER MASTER PLAN

FIGURE 6A
METROPOLITAN BAKERSFIELD GENERAL PLAN LAND USE DESIGNATIONS

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L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE6A.dwg 3/17/2004 3:48:19 PM PST

The County, in September 2002, initiated the preparation of this study with a Request for Proposal for engineering services. The project and scope of work were defined as:

A. PROJECT DESCRIPTION

The unincorporated portion of Northwest Bakersfield is for the most part served by private septic systems. Newer developments have dry sewer systems installed in addition to the private septic systems. Some areas within close proximity to major sewer trunk lines are connected directly to live sewer belonging to either the City of Bakersfield or North of River Sanitation District. There exists a need for a Master Sewer Plan to connect the existing and future dry sewer systems to existing trunk lines and treatment facilities. This Plan will serve as a guide for alignment, elevations, pipe size, and lift station locations. It will also provide a cost analysis and basis for a sewer impact fee to provide funding for the construction of required infrastructure.

C. SERVICES TO BE PROVIDED BY THE ENGINEER

The Engineer shall prepare engineering reports, studies, alternates and recommendations for the course of action relative to sewerage alternatives for the property owners of Rosedale Community. The services to be performed by the Engineer shall include, but not be limited to, the following:

1) Investigate current wastewater disposal methods, practice and conditions.

2) Develop proposed 3 to 5 service/benefit areas and prepare draft boundary maps for County review.

3) Prepare a preliminary design/layout of waste water system and estimate the present and future sewage flows and quality characteristics after approval of benefit areas by County.

4) Evaluate existing dry sewer systems and future tie-ins to existing and future trunk lines.

5) Develop cost estimates for required trunk lines and pump stations.

6) *Coordinate conceptual design and disposal methods with North of River Sanitation District and the City of Bakersfield.*

7) *Prepare engineer's estimates for the approved alternatives.*

8) *Provide Draft report for review by ESS.*

9) *Provide engineering reports, studies, conclusions and recommendations regarding project feasibility and best course of action. Provide 12 copies of the studies/report and plans and an equal number of copies of the amended reports.*

The studies and reports shall consider hydrology, drainage, hydrogeology, environmental and topographic factors of the area.

This report is submitted in response to the outlined scope of work.

CHAPTER 2- EXISTING CONDITIONS

CHAPTER 2 - EXISTING CONDITIONS

County Planned Sewer Area No. 71 (CSA-71) is an urbanizing area northwest of the Kern River, between State Route 99 and State Route 43, extending north to the Seventh Standard Road area. Relatively flat and featureless, its topography is illustrated on Figure 5. Approximately 33.8 square miles of the northern portion of the area is designated to be served by NORSD, 31.9 square miles to be served by the City. Currently, 13.5 square miles of the City's service area is within incorporated City limits, 59.8 within unincorporated County territory.

Figure 6-A shows the General Plan Land Use Designations for CSA-71 and its immediate surroundings; Figure 6-B defines the land use designations; Figure 6-C defines Equivalent Single Family Dwellings (ESFD) Conversions. Figure 7 shows existing levels of sewer service in CSA-71, in both the City and NORSD service areas. Figure 8 shows the existing sewer systems serving the Area.

RESIDENTIAL

RR	RURAL RESIDENTIAL MINIMUM 2.5 GROSS ACRES/UNIT
ER	ESTATE RESIDENTIAL MINIMUM 1 NET ACRE/UNIT
UER	URBAN ESTATE RESIDENTIAL MINIMUM 0.5 NET ACRE/UNIT
SR	SUBURBAN RESIDENTIAL ≤ 4 D.U./NET ACRE
SR/LR	COUNTY JURISDICTION: ≤4 D.U./NET ACRE CITY JURISDICTION: ≥4 AND ≤7.26 D.U/NET ACRE
LR	LOW DENSITY RESIDENTIAL ≤7.26 D.U./NET ACRE
LMR/LR	COUNTY JURISDICATION: ≤10 D.U./NET ACRE CITY JURISDICATION: ≥4 AND 7.26 D.U./NET ACRE
LMR	LOW MEDIUM DENSITY RESIDENTIAL COUNTY JURISDICTION: ≤10 D.U./NET ACRE CITY JURISDICTION: ≥4 AND <10 D.U./NET ACRE
HMR/LMR	COUNTY JURISDICTION: ≤17.42 D.U./NET ACRE CITY JURISDICTION: ≥4 AND ≤10 D.U./NET ACRE
HMR	HIGH MEDIUM DENSITY RESIDENTIAL COUNTY JURISDICTION: ≤17.42 D.U./NET ACRE CITY JURISDICTION: ≥7.26 AND ≤17.42 D.U./NET ACRE
HR	HIGH DENSITY RESIDENTIAL ≥17.42 AND ≤72.6 D.U./NET ACRE

COMMERCIAL

HC	HIGHWAY COMMERCIAL
GC	GENERAL COMMERCIAL
OC	OFFICE COMMERCIAL
MC	MAJOR COMMERCIAL
MUC	MIXED USE MAJOR/OFFICE COMMERCIAL

INDUSTRIAL

LI	LIGHT INDUSTRIAL
SI	SERVICE INDUSTRIAL
HI	HEAVY INDUSTRIAL

PUBLIC FACILITIES

P	INCLUDES: GOVERNMENT BUILDINGS, HOSPITALS, PUBLIC UTILITIES, CEMETERIES, SEWAGE TREATMENT PLANTS, WASTE DISPOSAL SITES AND OTHER PUBLICLY OWNED FACILITIES
PS	PUBLIC AND PRIVATE SCHOOLS
PT	PUBLIC TRANSPROTATION CORRIDOR
P-SW	SOLID WASTE FACILITY SITES
LR/PS	LOW DENSITY RESIDENTIAL PUBLIC AND PRIVATE SCHOOLS

OPEN SPACE

OS	INCLUDES: RESOURCE MANAGEMENT AREAS, AGRICULTURE AND FLOODPLAINS
OS-P	PARKS AND RECREATION FACILITIES
OS-S	SLOPES EXCEEDING 30%

RESOURCE

R-IA	INTENSIVE AGRICULTURE: MINIMUM 20 ACRE PARCEL SIZE
R-EA	EXTENSIVE AGRICULTURE: MINIMUM 20 ACRE PARCEL SIZE (LANDS UNDER WILLIAMSON ACT: MINIMUM 80 ACRE PARCEL)
R-MP	MINERAL PETROLEUM AND MINMUM 5 ACRE PARCEL

CITY LIMITS AS OF 1/11/02

SPHERE OF INFLUENCE

CSA-71

COUNTY OF KERN
SEWER MASTER PLAN

FIGURE 6B
METROPOLITAN BAKERSFIELD GENERAL PLAN
LAND USE DESIGNATIONS
DEFINITIONS

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L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE6B.dwg 3/17/2004 3:48:53 PM PST

Residential Equivalent Single Family Dwellings (ESFD) per Gross Acre

USE CODE	DESCRIPTION	ESFD PER GROSS ACRE
RR	RURAL RESIDENTIAL	0.40
ER	ESTATE RESIDENTIAL	0.95
UER	URBAN ESTATE RESIDENTIAL	1.33
SR	SUBURBAN RESIDENTIAL	3.00
LMR	LOW MEDIUM DENSITY RESIDENTIAL	9.00
HMR	HIGH MEDIUM DENSITY RESIDENTIAL	15.68

COMMERCIAL

USE CODE	DESCRIPTION	ESFD PER GROSS ACRE
GC	GENERAL COMMERCIAL	12.82
OC	OFFICE COMMERCIAL	12.82

INDUSTRIAL

USE CODE	DESCRIPTION	ESFD PER GROSS ACRE
LI	LIGHT INDUSTRIAL	17.32
SI	SERVICE INDUSTRIAL	17.32

THE ABOVE CONVERSION TO EQUIVALENT SINGE FAMILY DWELLINGS (ESFD) PER GROSS ACRE WAS OBTAINED FORM THE BAKERSFIELD CITY SERVICE AREA NO. 1 PLANNED SEWER AREA SEWER STUDY PREPARED BY KERN COUNTY ENGINEERING & SURVEY SERVICES, MARCH 30, 2002.

Additional Use Codes

USE CODE	DESCRIPTION	ESFD PER GROSS ACRE
LR	LOW DENSITY RESIDENTIAL	6.00
*PS	PUBLIC AND PRIVATE SCHOOLS	3.50
OS-P	PARKS WITH FACILITIES	0.08
**MSI	MODIFIED SERVICE INDUSTRIAL	1.42

* REFERENCED FROM CITY OF BAKERSFIELD ASSESSMENT DISTRICT 93-1

** DEVELOPED FROM ASSUMMED 20 EMPLOYEES/ACRE WITH A GENERATION OF 20GAL/EMPLOYEE PER DAY.

CSA-71

COUNTY OF KERN

SEWER MASTER PLAN

FIGURE 6C

EQUIVALENT SINGLE FAMILY DWELLINGS (ESFD) CONVERSIONS

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L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE6C.dwg 3/17/2004 3:49:26 PM PST

SEVENTH STANDARD RD.
ZERKER RD.
SANTA FE WAY
99
SNOW RD.
KRATZMEYER RD.
NORRIS RD.
SULLIVAN RD.
OLIVE DR.
43
SUPERIOR RD.
GREELEY RD.
NORD AVE.
HEATH RD.
RENFRO RD.
ALLEN RD.
JEWETTA AVE
CALLOWAY DR.
58
HAGEMAN RD.
MEACHAM RD.
RUDD AVE
FRUITVALE AVE
ROSEDALE HWY.
JENKINS RD.
COFFEE RD.
MOHAWK ST.
DRIVER RD.
BRIMHALL RD.
BRIMHALL RD.
ENOS LN.
KERN RIVER
STOCKDALE HWY.
BUENA VISTA RD.

SCALE: 1"= 5000'

5000 0' 5000

LEGEND

- CSA-71 BOUNDARY
- CITY LIMITS BAKERSFIELD
- CITY LIMITS SHAFTER
- RAILROAD
- CANALS
- FULL SEWERED SERVICE AREAS
- DRY SEWERED SERVICE AREAS
- SEPTIC TANK SERVICE AREAS
- UNDEVELOPED AREAS

COUNTY OF KERN
CSA-71
SEWER MASTER PLAN

FIGURE 7
LEVEL OF SEWER SERVICE

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L:\Engineering\2002\02821 Kern 66\Acad\FINAL FIG 6-07\FIGURE7.dwg 3/7/2004 3:03:06 PM PST

SCALE: 1"= 5000'

5000 0' 5000

LEGEND

- CSA-71 BOUNDARY
- CITY LIMITS BAKERSFIELD
- CITY LIMITS SHAFTER
- CANALS
- ALLEN RD. SEWER MAIN
- BUENA VISTA RD. SEWER MAIN
- DRY SEWER
- N.O.R.S.D. SEWER MAIN
- FM S.S. FORCE MAINS
- S.S. LIFT PUMP STATIONS

COUNTY OF KERN
CSA-71
SEWER MASTER PLAN

FIGURE 8
EXISTING SEWER SYSTEMS

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L:\Engineering\2002\02823 Kern 99\Acad\FINAL FIG 8-02\FIGURE8.dwg 3/17/2004 3:59:24 PM PST

Excerpts from the March 2002 Sewer Study for Bakersfield City Planned Sewer Area No. 1 report prepared by the Kern County staff succinctly describe existing conditions not only in that Planned Sewer Area but in the total CSA-71 Area:

The County of Kern has agreements with the City of Bakersfield (and North of River Sanitary District), to transport and treat the wastewater generated in a fringe community located in the Rosedale area. The area has been developed with dry sewer systems. The homes are served by onsite septic systems as an interim treatment measure until the dry sewers can be connected to main trunk line sewers to transport the waste to a centralized wastewater treatment plant. There is economic, environmental, health-and-safety, and policy-mandated justification to connect to centralized treatment works. Funds to construct major connecting trunk lines have not been available and need to be accumulated.

The Kern County General Plan, the Metropolitan Bakersfield 2010 General Plan and the Western Rosedale Specific Plan all contain goals and policies related to the provision of public sewer collection and centralized treatment to accommodate new development.

Since the formation of County Planned Sewer Area 71, developments of less than 250 lots in areas where public sewer is not available have been permitted to build on-site disposal systems (septic tanks with leach fields) along with dry sewers. This was intended to allow development to continue until public facilities became available. Under these existing policies the County has experienced very little success converting homes to public sewerage.

Major trunk lines are now within reasonable distance of the existing dry sewered neighborhoods. Kern County and the City of Bakersfield have built a major trunk line along Allen Road and from Brimhall Road south to the City's Treatment Plant No. 3. North of the River Sanitation District is building a trunk line from just north of Hageman Road to their treatment plant. Existing dry-sewered neighborhoods and other planned future development now lie less than a mile from these two trunk lines making sewer service feasible. The County has made numerous attempts to get communities

to form assessment or other districts to fund the construction of trunk lines and associated connection costs with very little success.

Properties proposing land use changes within the Western Rosedale Specific Plan are required to connect to public sewerage. Where connection is not feasible at the time of development, policies need to be formed that require developer fees that prepay the cost of trunk line construction and connection costs so that assessment districts will not have to be formed after the homes are sold.

The City of Bakersfield has agreed to transport and treat the wastewater produced within a designated portion of unincorporated County. The intent is to serve this fringe area with a trunk line constructed northerly along Allen Road terminating at Brimhall Road, which will transport the sewage to City Plant No. 3 at Ashe Road south of Panama Lane.

Funds for the County's share of the Allen Road trunk line were available from monies collected from the entire County Planned Sewer Area. These funds are nearly depleted and need to be replaced; additional funds are needed to construct connecting trunk lines. Trunk line fees, collected as future subdivisions are built, will provide funds for trunk line construction.

In that respect the County provided the following conclusions and rationales for centralized sewer service to the CSA-71 area:

The study area has serious sewerage problems that can be mitigated by connection to centralized treatment. Major trunk line capacity is currently available within reasonable proximity.

Rationales

Economic: The costs for construction of two separate sewage treatment systems (septic tanks and dry sewer) are borne by each homeowner as part of the purchase price. Homeowners also bear the burden of paying to abandon the septic system when dry sewers are connected. It is not practical for individual homeowners to extend trunk lines as their septic systems fail.

Neighborhoods have not been willing to form assessment districts to finance the extension of trunk lines and connection fees.

Environmental: As on site treatment systems age, the leach fields fail due to plugging of soil pores, root intrusion and improper maintenance. The typical repair is to abandon the leach field and construct seepage pits. Seepage pits are a 15'-deep, five-foot diameter hole, followed by a 30'-deep three-foot diameter hole for a total depth of 45'. According to the 1999 Report On Water Conditions (KCWA) depth to groundwater in the study area ranged from 80' to 100'. It follows that there is a very real threat to groundwater quality, which can only increase as the leach field's age. The California Regional Water Quality Control Board required the formation of County Planned Sewer Area 71 to provide for public sewer systems within the Rosedale area.

Health and Safety: As septic systems age, failure is a raw sewage overflow, usually into the home or in the yard. Many homes begin discharging gray water into the yard to reduce the load on their septic system, which can create other health problems. Pathogens found in wastewater are bacteria, viruses, protozoa and helminthes, which cause typhoid, hepatitis A, diarrhea, dysentery and worms.

Planning and Mandates: The orderly progression of development as outlined in various Master Plans includes the treatment of liquid waste at a centralized plant. The Western Rosedale Specific Plan states that CSA 71 shall collect fees to construct sewer trunk facilities to serve those areas without sewer.

Development is currently proceeding at an accelerating pace in the CSA-71 area, and the premises advanced in the County's 2002 report are increasingly valid.

CHAPTER 3 - BENEFIT AREA IDENTIFICATION

CHAPTER 3 - BENEFIT AREAS

Figure 9 shows existing and proposed sewer service areas within CSA-71.

Existing benefit areas include:

County Planned Sewer Areas A and B within the NORSD service area

and

City Planned Sewer Area #1 within the City's service area.

Additional benefit areas are recommended for study based on the following criteria:

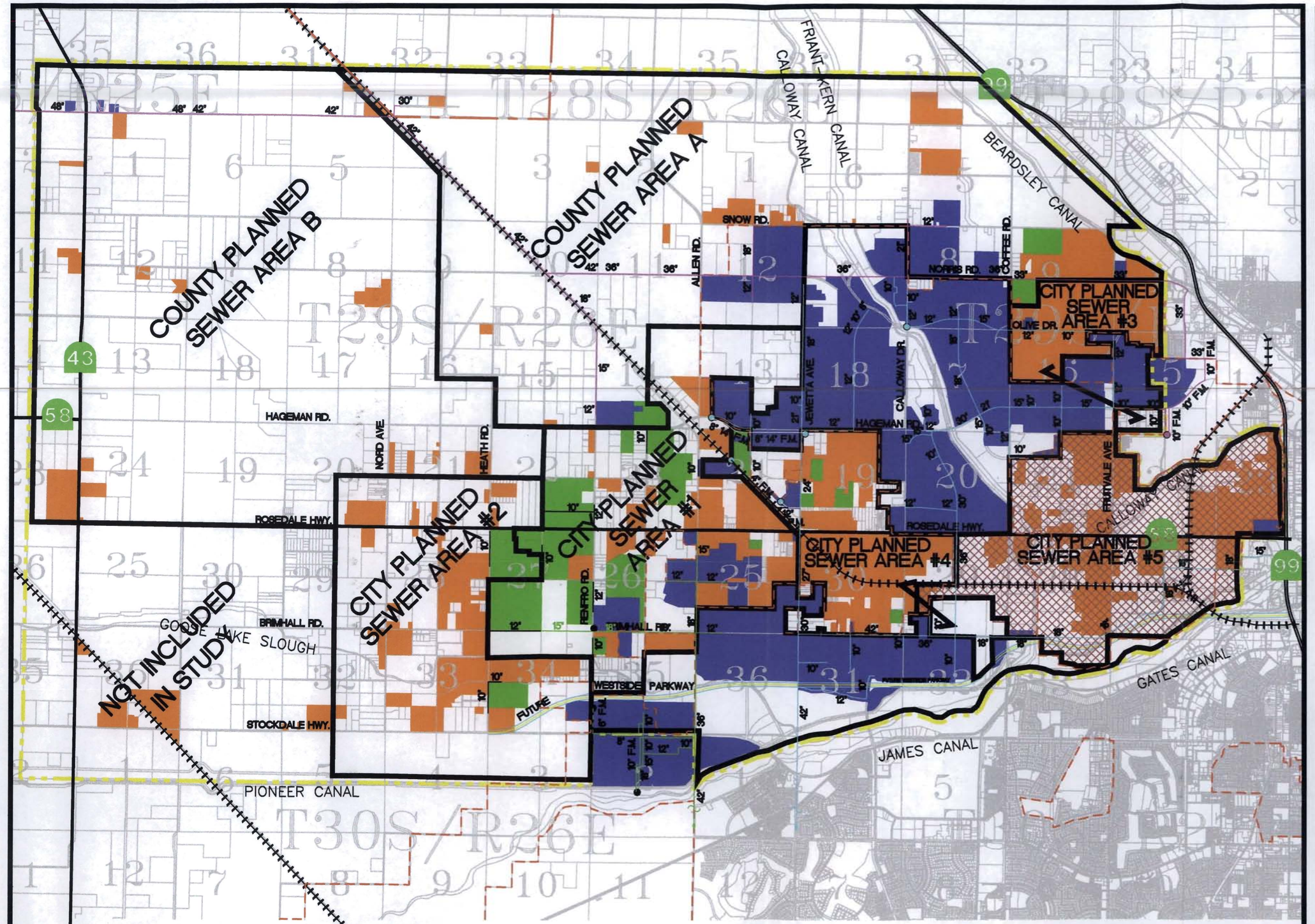
- Economic connection to existing or proposed public sewer facilities.
- Recognition of topographic constraints.
- Evaluation of dry sewer and septic tank service area demands.
- Analysis of other constraints such as industrial development, freeway and rail construction, environmental or water quality concerns.
- Equitable distribution of costs.

Based on these criteria:

1. The extreme southwest portion of the study area was eliminated from sewerage, and benefit area, consideration because of environmental/water quality concerns including existing slough, groundwater recharge areas and excessive pumping costs. Development of this area in the foreseeable future is considered unlikely.

2. City Planned Sewer Area #2 was identified as a logical benefit area. It has, at present, significant area served by septic tank, and its sewer transport needs two pump stations with discharge to the Allen Road trunk are evident and will be internally equitable.

3. City Planned Sewer Area #3, the area immediately north and south of Olive Drive in the northeast corner of the City's service area meets all selection criteria (sewerage demand, no constraints, and internal cost equitability).



SCALE: 1"= 5000'

5000 0' 5000

LEGEND

- CSA-71 BOUNDARY
- CITY LIMITS BAKERSFIELD
- CITY LIMITS SHAFTER
- RAILROAD
- SEWER MAINS
- F.M. S.S. FORCE MAINS
- S.S. LIFT PUMP STATIONS
- FULL SEWERED SERVICE AREAS
- DRY SEWERED SERVICE AREAS
- SEPTIC TANK SERVICE AREAS
- INDUSTRIAL AREA
- SERVICE AREAS

COUNTY OF KERN CSA-71 SEWER MASTER PLAN

FIGURE 9

PLANNED SEWER AREAS

Quad Knopf

L:\Engineering\2002\02021 Kern 98\Acad\FINAL FIG 6-03\FIGURE9.dwg 8/7/2004 3:55:04 PM PST

4. City Planned Sewer Area #4 is recommended to encompass the almost fully developed but unsewered area east of City Planned Sewer Area #1. It, also, meets all selection criteria. This report will evaluate the ability of the existing Buena Vista trunk line to accommodate the service Area's flow, or other alternative means of transport to City Plant No. 3.

5. City Planned Sewer Area #5 is a largely industrialized area in the southeasterly portion of CSA-71. Flows from the area have been estimated, based upon field investigation, to approximate those derived from an employment density of twenty per acre and a daily flow per employee of 20 gallons.

   Development in the area is principally service commercial and light industrial not involving industrial waste discharges.

These study proposals will be evaluated, and their recommendation confirmed or modified, in succeeding chapters of this report.

CHAPTER 4 - DESIGN ANALYSES

CHAPTER 4 - DESIGN ANALYSES

Design Criteria

- Demand and design flows

Equivalent single family dwellings in each analysis area were calculated based on the general plan designation on Figure 6-A and designation densities on Figure 6-B. Conversion to Equivalent Single Family Dwellings (ESFD)/gross acre was based upon Davis' Land Development Handbook, Kern County Planning Department, City of Bakersfield flow factors, and actual build-out. See Figure 6-C. Mobile home parks and schools were based on typical sewer service user fee rates.

Design flows were calculated according to Kern County Development Standards, Sec. 302.1, "Sanitary Sewers Design Criteria." Table 1 compares County, City and NORSD design criteria; they are similar in most respects. Figure 10 shows comparative peaking factors. Pipe sizing was by the Manning Equation utilizing n=0.013. Topographic analysis was by USGS Quadrangle maps for general elevations of undeveloped land and by as-built sewer improvement plans for dry-sewered developments. Care was taken in topography conversions because of land settlement in the Area.

Trunk lines were designed to connect to existing dry sewers at minimum slopes. Certain areas were determined to require pumping; therefore, lift stations to raise the wastewater sufficiently to proceed by gravity have been incorporated in the conceptual designs. Pips sizing was determined using SewerCAD®; electronic data files are submitted with this report.

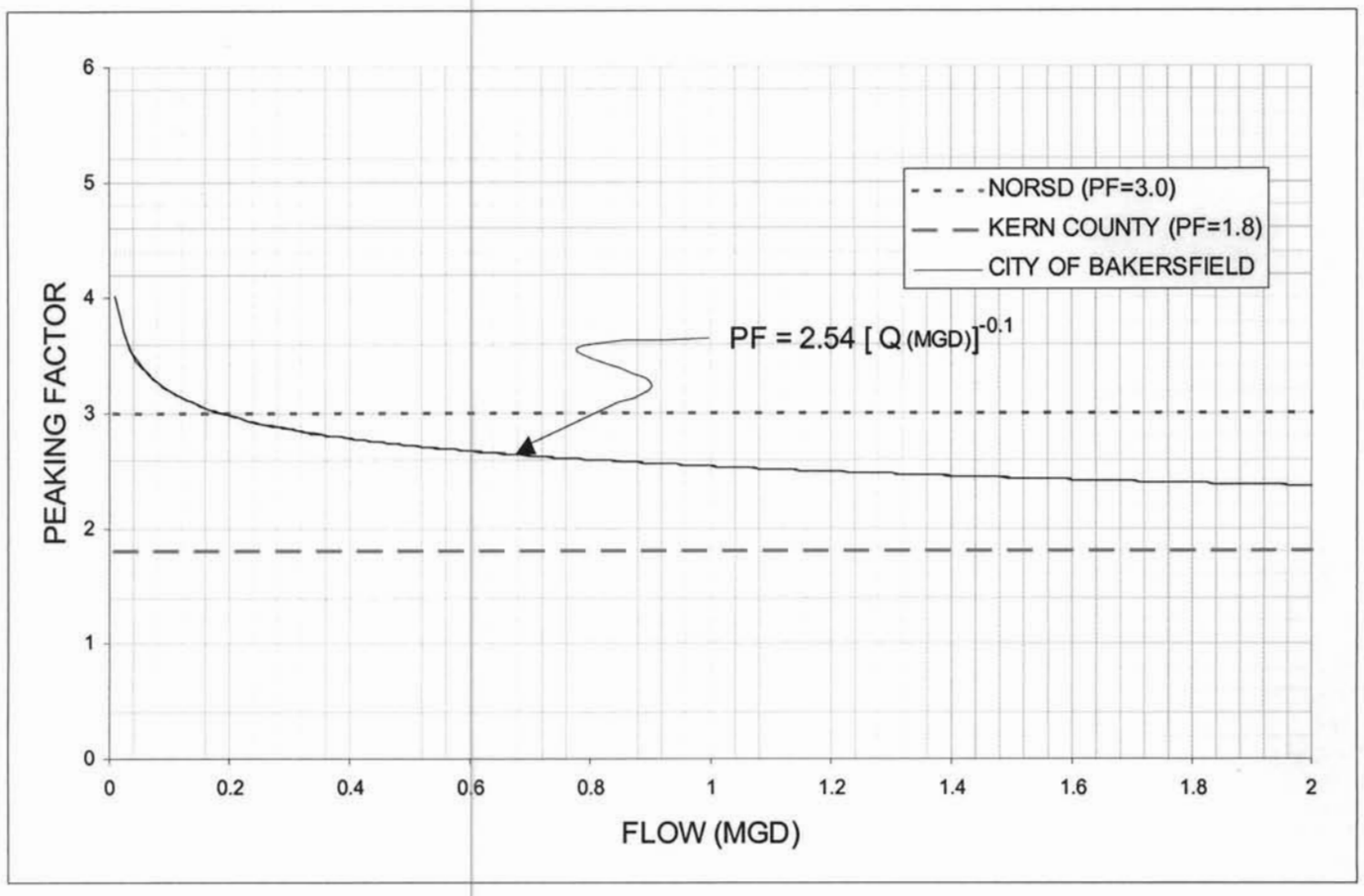
- North of River Sanitary District (NORSD) Master Planned Sewers.

The design of NORSD sewers developed in the February 2002 Boyle Engineering/NORSD report was reviewed in accord with the above design criteria and found to be in general accord therewith and thereby acceptable as a basis for this study. (See Figure 11 for the sewer master plan for the NORSD area , Figure 12A and Figure 12B for the inclusion of a sewer collection system in County planned sewer Area A and Area B including sewer lift pump stations to address areas excluded in the Boyle Engineering/NORSD report for sewer service and Appendix for outfall capacity calculations.)

Table 1

Design Standards

Item		Kern County	Bakersfield City	N.O.R.S. Dist. #1
Avg. Family/RDU (People)		2.8	2.6	--
Avg. Multi-Family/RDU (People)		2.24	2.0	--
Avg. Daily Discharge/Person		100 Gal.	100 Gal.	100 Gal.
Peak Factor		1.8	2.54 x (Avg. Mgd.) -0.1	3.0
Peak Factor for Commercial		1.8	1.8	--
Peak Factor for Industrial		2.0	2.0	--
Peak Discharge Rate Commercial		6460 GPD/GA	6460 GPD/GA	--
Peak Discharge Rate Industrial		9695 GPD/GA	9695 GPD/GA	--
"n" for P.V.C. Pipe		0.011	0.011	0.013
"n" for Other Pipe		0.013	0.013	0.013
Depth Peak Flow, d $\leq$ 15"		0.70	Full Flow	--
Depth Peak Flow, d > 15"		Full Flow	Full Flow	--
Depth Peak Flow, d $\leq$ 12"		--	--	0.50
Depth Peak Flow, d $\leq$ 15"		--	--	0.75
Min. Flow Velocity @ Full Flow		2.00 Ft./Sec.	2.00 Ft./Sec.	--
Min. Flow Velocity w/Approval		1.50 Ft./Sec.	1.60 Ft./Sec.	--
Max. Flow Velocity		Flow < Critical	10 Ft./Sec. Flow < Critical	--
Min Slope (Ft./100 Ft.)	d = 6"	0.50	0.50	--
@ n=0.013	d = 8"	0.35	0.35	0.40
	d = 10"	0.25	0.25	0.28
	d = 12"	0.20	0.20	0.22
	d = 15"	--	0.15	0.16
	d = 18"	--	0.11	0.12
	d = 21"	--	0.09	0.10
	d = 24"	--	0.08	0.08
	d > 24"	--	0.08	--
Max. Dist. MH, d < 15"		400'	400'	400'
Max. Dist. MH d $\geq$ 15"		600'	600'	400'
Drop Through MH Turns $\geq$ 45°		0.10'	0.10'	--
Drop Through MH 0° < Turn $\geq$ 90°		--	--	0.5 $V^2/2g$ w/0.10' Min.
Design Diff. Pipe Sizes		Match Soffits	Match 0.80 Depth	Match Soffits
Curved SS Lines Allow EO		Yes	Yes	No
Min. Cover Over SS Lines in Str.		4.0'	2.5' For Lat.	6'



CSA-71

COUNTY OF KERN

SEWER MASTER PLAN

FIGURE 10

COMPARATIVE PEAKING FACTORS (RESIDENTIAL)

Quad Knopf

L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE10.dwg 3/17/2004 4:03:17 PM PST

- City of Bakersfield Allen Road/Buena Vista Road Trunk Sewers

The design analysis of these sewers contained in the 1997 Carollo Engineers/City of Bakersfield study was found to be in general accord with the above design criteria and thereby acceptable as a basis for this study.

Service Area Design Analyses

County Planned Sewer Areas A and B (NORSD)

The proposed NORSD master plan provides for flow via an existing outfall to the NORSD treatment plant and requires no alternatives analysis.

Service Area A is selected as the first to be developed (now under development). Service Area B constitutes the balance of the area to be served by NORSD.

City Planned Sewer Area #1

This Service Area substantially coincides with the prior sewer study area by the County of Kern titled "Bakersfield City Planned Service Area No. 1" as shown on Figure No. 13. Figure No. 13 also shows existing dry sewers with associated connection locations and additional areas integrated into the former boundary.

Since the formation of the area, it has been enlarged based upon City annexations.

Sewer pipe sizes with invert elevation obtained from construction plans and adjusted to city datum are shown. Slopes of proposed sewer trunk mains have been added to the figure for clarification of sufficiency of dry sewer connections.

City Planned Sewer Area #2

The topography of this Service Area, and its relationship to the Allen Road trunk sewer, dictate the installation of a pump station on Nord Avenue and a pump station at the southwest corner of the Service Area, with gravity flow thereto and pumped discharge to Allen Road. Supporting calculations are included in the Appendix; the pump station location, connecting sewers and force main all shown on Figure 14.

City Planned Sewer Area #3

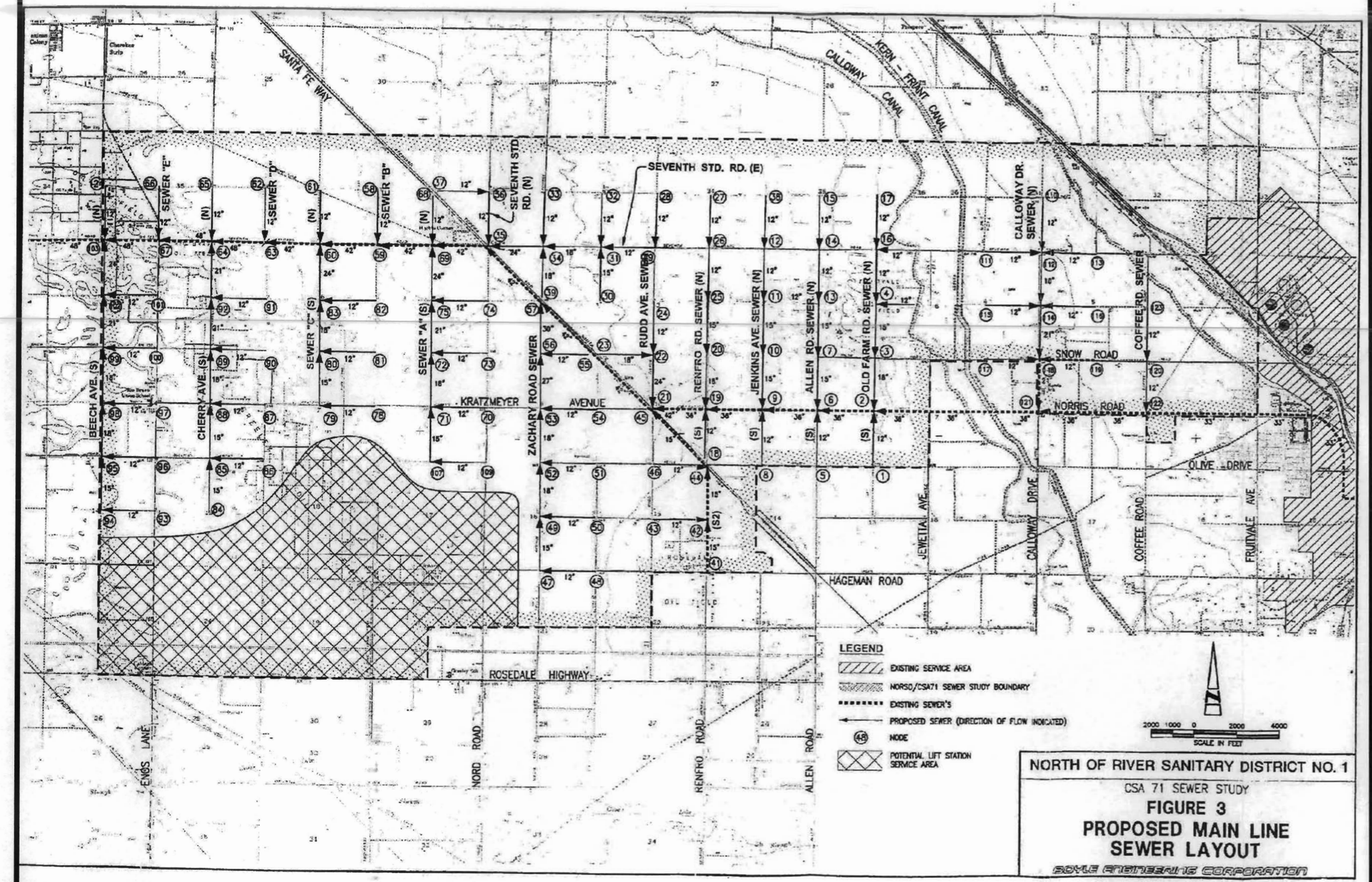
The location of this Service Area, north of the industrial area and an intervening sewered residential development, requires analysis of the sewer sizes required to serve as connectors to adequate-size components of the Allen Road trunk sewer systems. The sewer main installations necessary to effect these connections are shown on Figure 15 supporting calculations are included in the Appendix.

City Planned Sewer Area #4

The flows from this area, together with the incremental flows from Service Area #3, made it necessary to review the capacity of the Buena Vista trunk sewer and the Allen Road trunk sewer to its terminus at City Plant No. 3. This review, and the supporting calculations for connections from the Area to the Buena Vista trunk sewer and for trunk sewer capacity are included in the Appendix. Figure 16 shows the required sewer connections.

City Planned Sewer Area #5

The flows from a centralized sewer collection system for existing light industrial and general commercial areas currently served by septic tank service is connected through 18" main trunk sewer line (Mohawk Sewer) as shown on Figure 17 to the South. Flows from the area have been estimated, based upon field investigation, to approximate those derived from an employment density of twenty per acre and a daily flow per employee of 20 gallons. This review, and the supporting calculations for connections from the Area to the Buena Vista trunk sewer and for trunk sewer capacity are included in the Appendix.



NORTH OF RIVER SANITARY DISTRICT NO. 1

CSA 71 SEWER STUDY

FIGURE 3

PROPOSED MAIN LINE SEWER LAYOUT

BOYLE ENGINEERING CORPORATION

NOTE

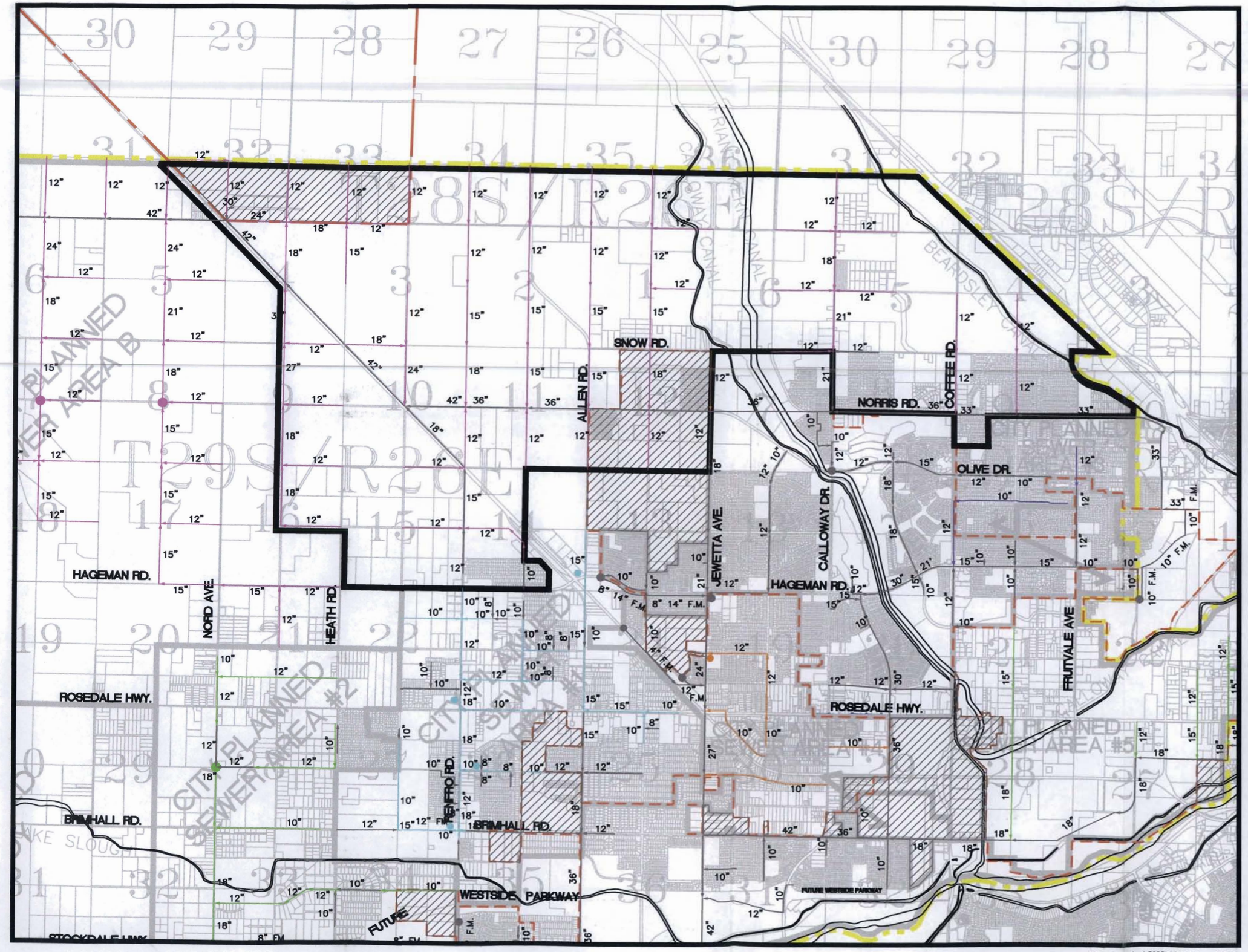
FIGURE NOT TO ANY GIVEN SCALE

COUNTY OF KERN
CSA-71
SEWER MASTER PLAN

FIGURE 11
COUNTY PLANNED SEWER AREAS A AND B
N.O.R.S.D MAIN LINE SEWER LAYOUT

Quad Knopf

L:\Engineering\2002\02831 Kern 88\Acad\FINAL FIG 9-08\FIGURE11.dwg 5/7/2004 4:04:07 PM PST



SCALE: 1"= 5000'

5000 0' 5000

LEGEND

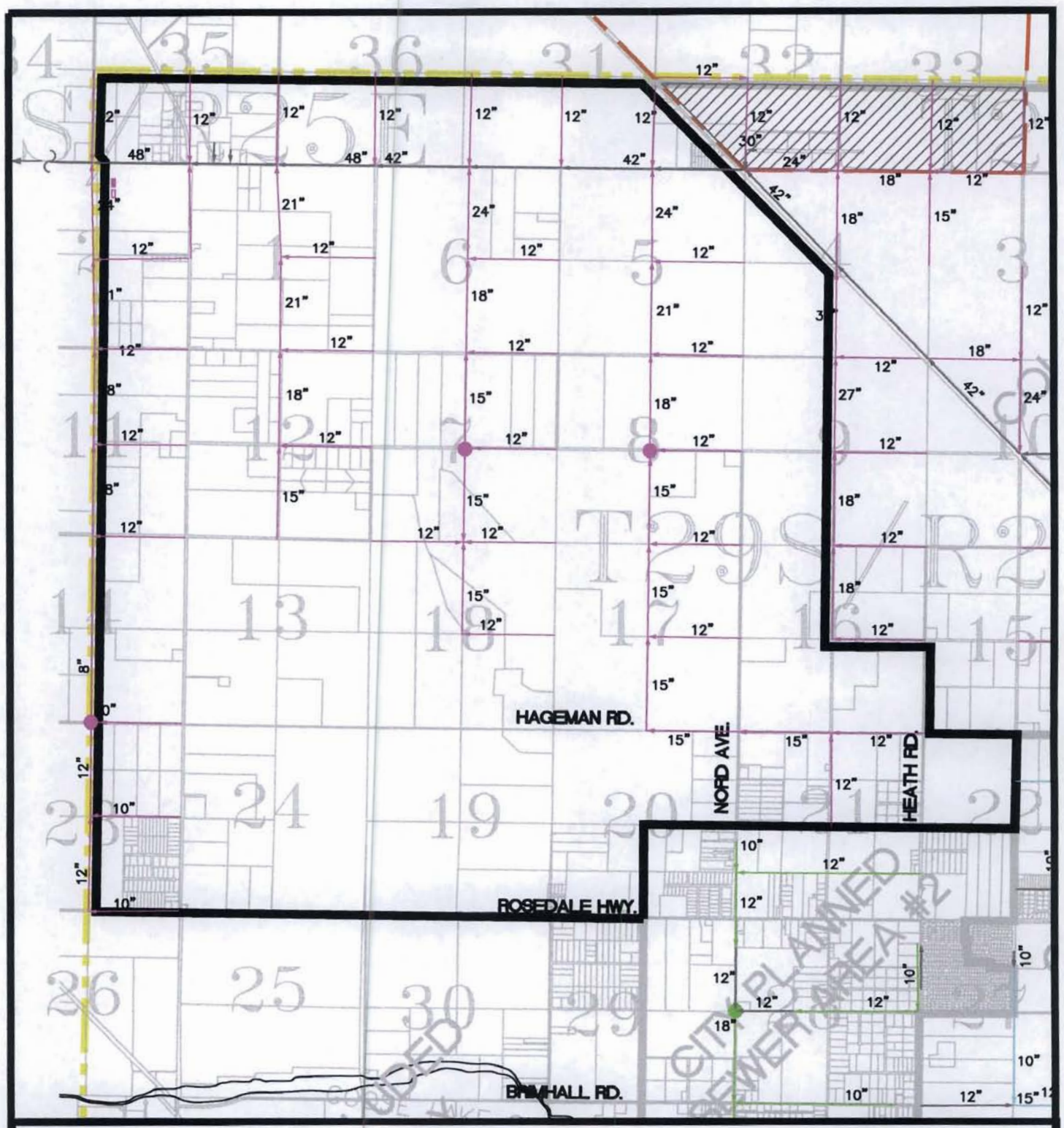
AREAS EXCLUDED FROM COUNTY ASSESSMENT

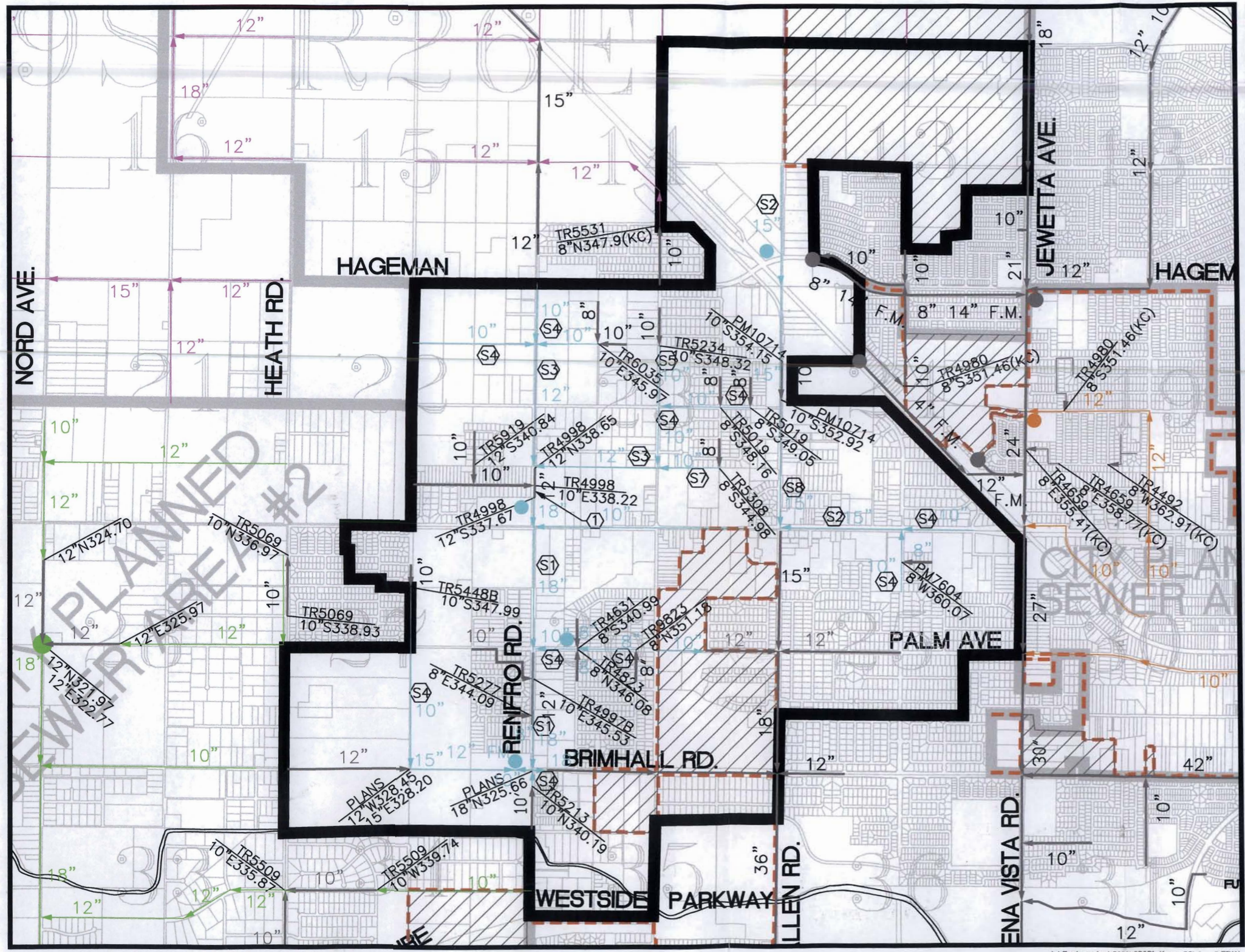
COUNTY OF KERN
CSA-71
SEWER MASTER PLAN

FIGURE 12A
SEWER SYSTEM
COUNTY PLANNED
SEWER AREA A

Quad Knopf

L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE12A.dwg 3/17/2004 4:05:26 PM PST


HAGEMAN RD.
NORD AVE.
HEATH RD.
ROSEDALE HWY.
BRIMHALL RD.
CITY PLANNED SEWER AREA #2
T29S/R25E
T29S/R26E
LEGEND
AREAS EXCLUDED FROM COUNTY ASSESSMENT
CSA-71
COUNTY OF KERN
SEWER MASTER PLAN
FIGURE 12B
SEWER SYSTEM
COUNTY PLANNED SEWER AREA B
SCALE: 1"= 4000'
4000 0' 4000
Quad Knopf
L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE12B.dwg 3/17/2004 4:06:16 PM PST



SCALE: 1"= 2000'

2000 0' 2000

LEGEND

- CSA-71 BOUNDARY
- CITY LIMITS
- BAKERSFIELD
- (KC) KERN COUNTY DATUM
- AREAS EXCLUDED FROM COUNTY ASSESSMENT

1. ALL INVERTS ARE TO CITY DATUM, EXCEPT WHERE NOTED.
2. EQUATIONS FOR DATUM (THIS SHEET ONLY)
   CITY + 1.96=NAVD88
   COUNTY + 1.34=NAVD88

NOTES:

(1) 12" ON RENFRO SHOULD BE REPLACED WITH AN 18" OR SHOULD BE ACCOMODATED WITH A LIFT STATION.

(S1) SLOPE=0.11%
(S2) SLOPE=0.15%
(S3) SLOPE=0.20%
(S4) SLOPE=0.25%
(S5) SLOPE=0.34%
(S6) SLOPE=0.35%
(S7) SLOPE=0.36%
(S8) SLOPE=0.10%

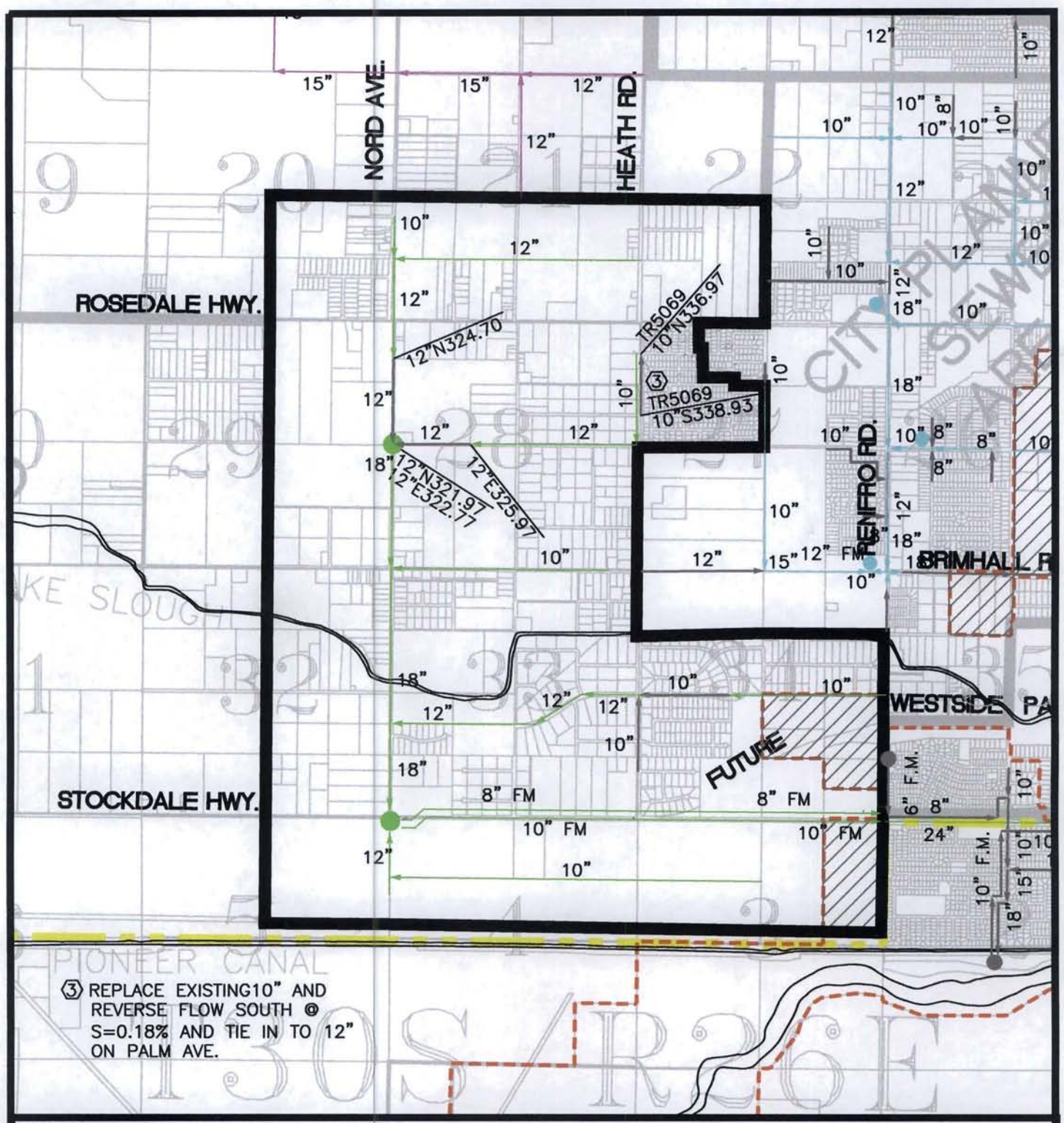
TR5069 10"N336.97 — TRACT NUMBER

DRY SEWER INVERT (BY PLAN)

COUNTY OF KERN
CSA-71
SEWER MASTER PLAN

FIGURE 13
SEWER SYSTEM CITY PLANNED SEWER AREA #1

L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE13.dwg 3/17/2004 4:07:11 PM PST



LEGEND

AREAS EXCLUDED FROM COUNTY ASSESSMENT

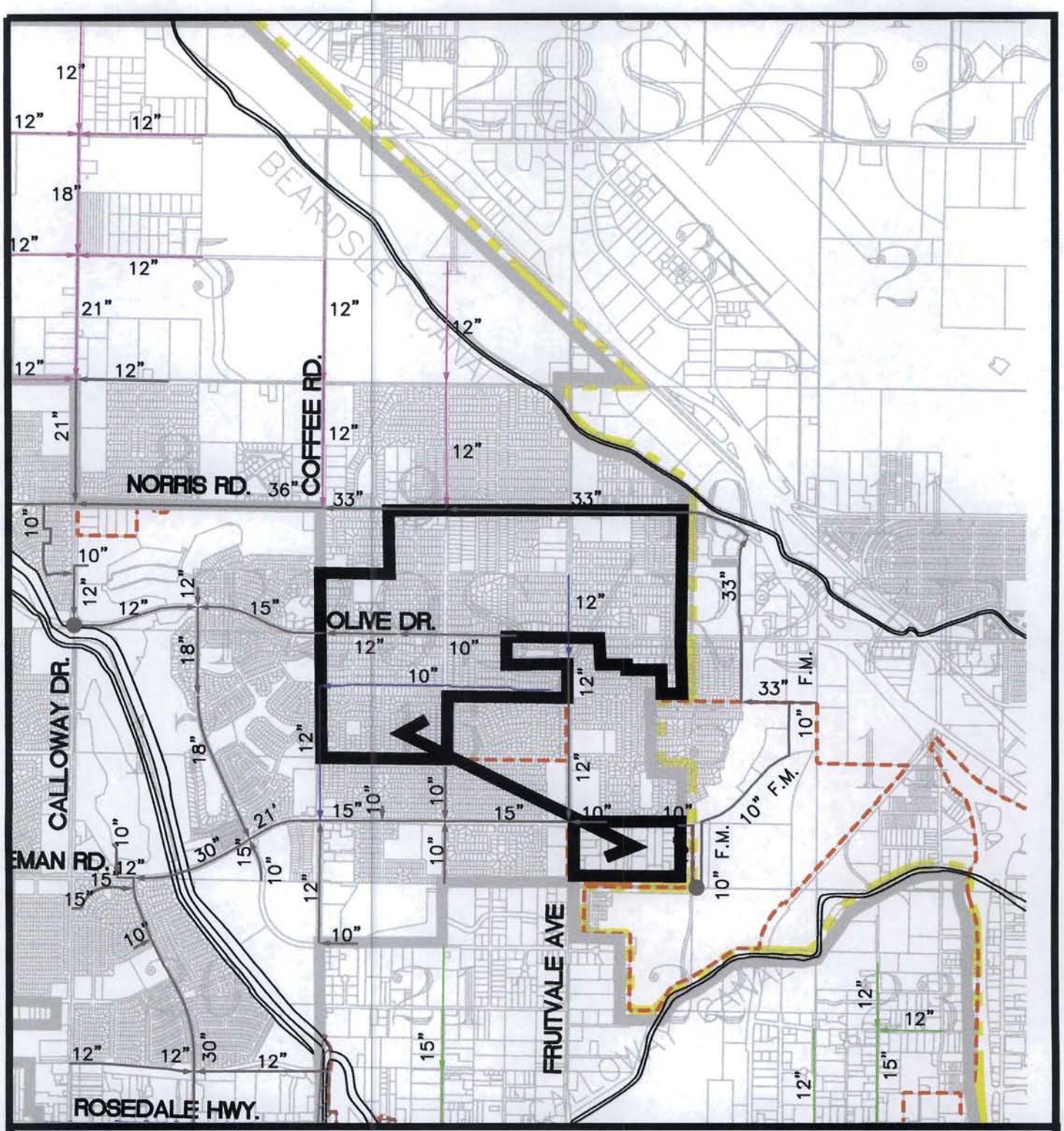
NOTES:
1. ALL INVERTS ARE TO CITY DATUM
2. EQUATIONS FOR DATUM (THIS SHEET ONLY)
   CITY + 1.96=NAVD88
   COUNTY + 1.34=NAVD88

CSA-71
COUNTY OF KERN
SEWER MASTER PLAN

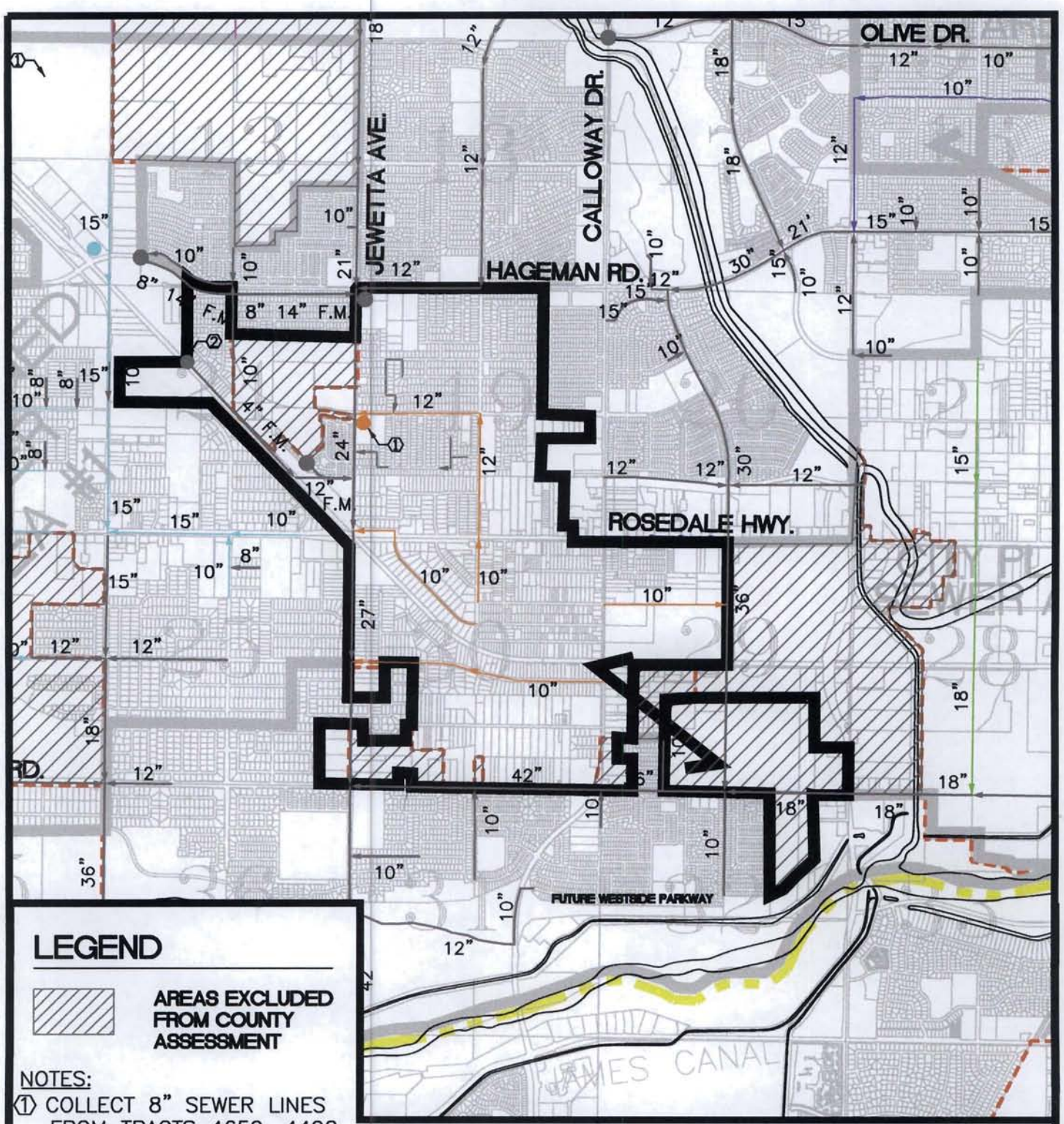
SCALE: 1"= 3000'
3000' 0' 3000'

FIGURE 14
SEWER SYSTEM
CITY PLANNED SEWER AREA #2

L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE14.dwg 3/17/2004 4:07:46 PM PST



L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE15.dwg 3/17/2004 4:08:34 PM PST



LEGEND

AREAS EXCLUDED FROM COUNTY ASSESSMENT

NOTES:

① COLLECT 8" SEWER LINES FROM TRACTS 4659, 4492, AND 4583 THROUGH LIFT STATION (SEE FIGURE 13 FOR DRY INVERTS)

② COLLET 8" SEWER LINE FROM TRACT 4980 TROUGH LIFT STATION OF PARCEL 10714

CSA-71
COUNTY OF KERN
SEWER MASTER PLAN

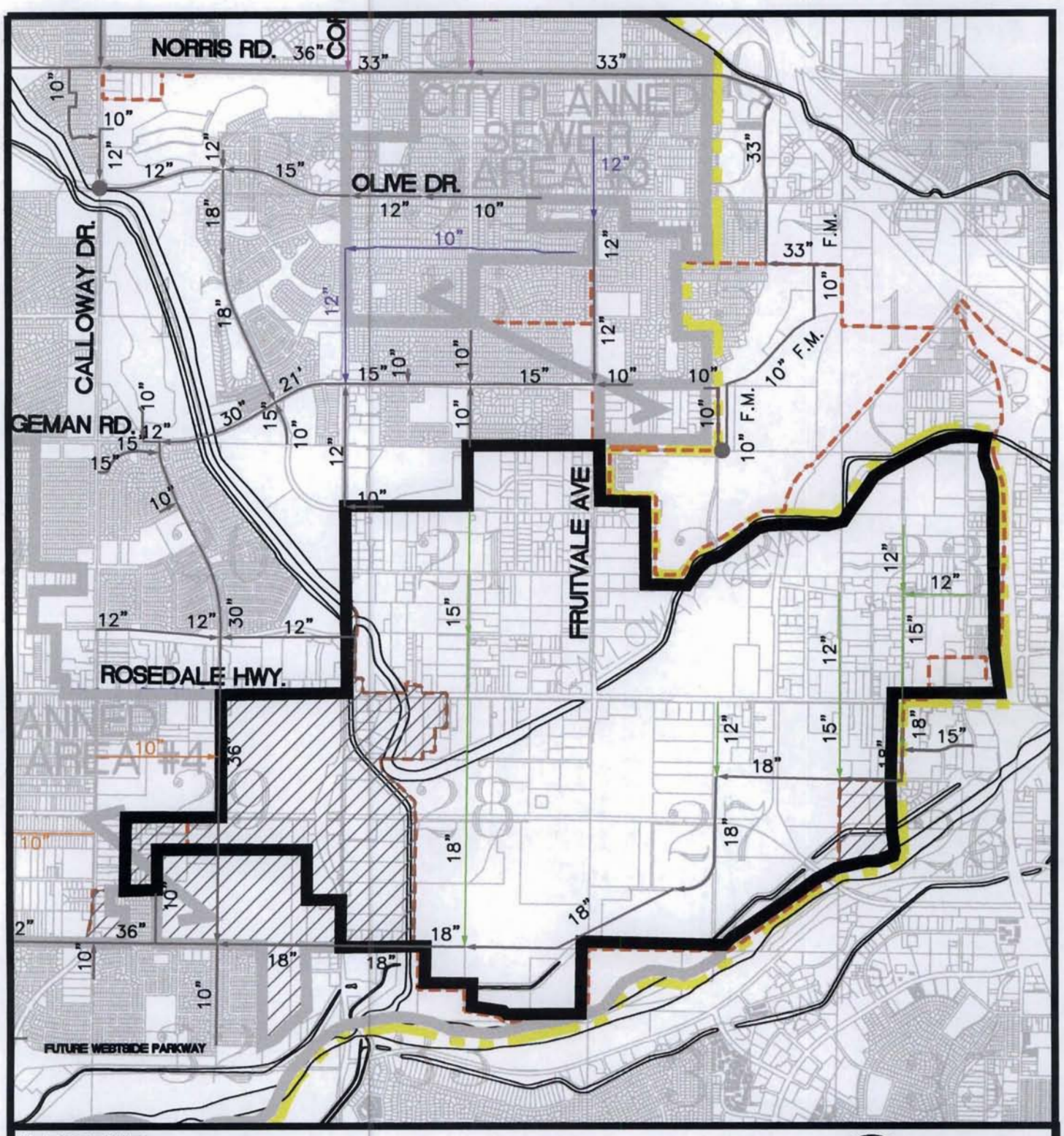
FIGURE 16
SEWER SYSTEM
CITY PLANNED SEWER AREA #4

SCALE: 1"= 3000'

3000' 0' 3000'

Quad Knopf

L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE16.dwg 3/17/2004 4:09:13 PM PST



LEGEND

AREAS EXCLUDED FROM COUNTY ASSESSMENT

CSA-71
COUNTY OF KERN
SEWER MASTER PLAN

SCALE: 1"= 3000'
3000' 0' 3000'

FIGURE 17
SEWER SYSTEM
CITY PLANNED SEWER AREA #5

L:\Engineering\2002\02621 Kern SS\Acad\FINAL FIG 6-03\FIGURE17.dwg 3/17/2004 4:10:08 PM PST

CHAPTER 5 - COST ESTIMATES

CHAPTER 5 - COST ESTIMATES

The cost estimates for each of the proposed Service Areas are summarized here. Estimating details are contained in the Appendix.

In making these estimates:

- Pipe Materials were assumed to be PVC.
- Trench depths were considered.
- Unit costs were based on past County and Quad Knopf bids; area contractors were contacted for confirmation.
- Trench dewatering, pavement resurfacing and utility connection restoration was considered.
- Costs were based on current prices, with an ENR June 2003 twenty-city national average construction cost index of 6694 (1913=100).
- Estimates were based on a segmental (reach) basis.
- A 15% contingency was added to estimated construction costs.
- Engineering, surveying and construction inspection were estimated at a total of 15% of construction costs plus contingency allowance.

County Planned Sewer Area A

Mobilization (10%)	$ 2,229.756
Trench Safety	100,000
Traffic Control	100,000
Develop Water	10,000
Manholes	1,960,200
12" PVC Trunk Line	6,019,200
15" PVC Trunk Line	2,772,000
18" PVC Trunk Line	1,900,800
21" PVC Trunk Line	528,000
24" PVC Trunk Line	580,800
27" PVC Trunk Line	316,800
30" PVC Trunk Line	343,200
Sawcut Pavement	696,960
Pavement Repair	6,969,600
Subtotal	24,527,316
Contingency (15%)	3,679,097
Subtotal	28,206,413
Engineering, Surveying, Construction Inspection (15%)	4,230,962
Total	$32,437,375

County Planned Sewer Area B

Mobilization (10%)	$ 1,883,592
Trench Safety	100,000
Traffic Control	100,000
Develop Water	10,000
Manholes	1,544,400
10" PVC Trunk Line	290,400
12" PVC Trunk Line	4,593,600
15" PVC Trunk Line	1,782,000
18" PVC Trunk Line	1,188,000
21" PVC Trunk Line	1,056,000
24" PVC Trunk Line	871,200
Sawcut Pavement	549,120
Pavement Restoration	5,491,200
SS Lift Pump Station	1,200,000
Real Estate Procurement	60,000
Subtotal	20,719,512
Contingency (15%)	3,107,927
Subtotal	23,827,439
Engineering, Surveying, Construction Inspection (15%)	3,574,116
Total	$27,401,555

City Planned Sewer Area #1

Mobilization (10%)	$ 740,381
Trench Safety	50,000
Traffic Control	50,000
Develop Water	10,000
Manholes	446,925
10" PVC Trunk Line	1,103,300
12" PVC Trunk Line	412,800
15" PVC Trunk Line	943,500
18" PVC Trunk Line	594,000
22" Bore and Casing at Hagman Road for 15" PVC Line	26,400
22" Bore and Casing at Rosedale Hwy for 15" PVC Line	26,400
26" Bore and Casing at Rosedale Hwy for 18" PVC Line	31,200
Sawcut Pavement	184,480
Pavement Restoration	1,844,800
SS Lift Pump Station	1,600,000
Real Estate Procurement	80,000
Subtotal	8,144,186
Contingency (15%)	1,221,628
Subtotal	9,365,813
Engineering, Surveying, Construction Inspection (15%)	1,404,872
Total	$ 10,770,685

City Planned Sewer Area #2

Mobilization (10%)	$ 837,975
Trench Safety	50,000
Traffic Control	100,000
Develop Water	10,000
Manholes	491,250
10" PVC Trunk Line	1,039,500
12" PVC Trunk Line	954,000
18" PVC Trunk Line	720,000
24" PVC Trunk Line (Proposed by COB / Const. 04-05)	583,000
8" and 10" PVC Force Main	954,000
20" Bore and Casing at Rosedale Hwy. for 12" PVC Line	24,000
26" Bore and Casing at Stockdale Hwy. for 18" PVC Line	31,200
Sawcut Pavement	234,800
Pavement Restoration	2,348,000
SS Lift Pump Station	800,000
Real Estate Procurement	40,000
Subtotal	9,217,725
Contingency (15%)	1,382,659
Subtotal	10,600,384
Engineering, Surveying, Construction Inspection (15%)	1,590,058
Total	$12,190,441

City Planned Sewer Area #3

Mobilization (10%)	$ 117,488
Trench Safety	50,000
Traffic Control	50,000
Develop Water	5,000
Manholes	106,875
10" PVC Trunk Line	275,000
12" PVC Trunk Line	270,000
Sawcut Pavement	38,000
Pavement Restoration	380,000
Subtotal	1,292,363
Contingency (15%)	193,854
Subtotal	1,486,217
Engineering, Surveying, Construction Inspection (15%)	222,933
Total	$1,709,149

City Planned Sewer Area #4

Mobilization (10%)	$ 230,848
Trench Safety	50,000
Traffic Control	50,000
Develop Water	10,000
Manholes	174,375
10" PVC Trunk Line	562,100
12" PVC Trunk Line	316,800
18" Bore and Casing at Railroad for 10" PVC Line	21,600
18" Bore and Casing at Rosedale Hwy. for 10" PVC Line	21,600
Sawcut Pavement	62,000
Pavement Restoration	620,000
SS Lift Pump Station	400,000
Real Estate Procurement	20,000
Subtotal	2,539,323
Contingency (15%)	380,898
Subtotal	2,920,221
Engineering, Surveying, Construction Inspection (15%)	438,033
Total	$3,358,254

City Planned Sewer Area #5

Mobilization (10%)	$ 289,818
Trench Safety	50,000
Traffic Control	50,000
Develop Water	10,000
Manholes	180,375
12" PVC Trunk Line	402,000
15" PVC Trunk Line	495,000
18" PVC Trunk Line	666,000
20" Bore and Casing at Rosedale Hwy. for 12" PVC Line	24,000
22" Bore and Casing at Rosedale Hwy. for 2 x 15" PVC Line	52,800
26" Bore and Casing at Rosedale Hwy. for 18" PVC Line	31,200
26" Bore and Casing at RR for 18" PVC Line	26,000
Sawcut Pavement	82,800
Pavement Restoration	828,000
Subtotal	3,187,993
Contingency (15%)	478,199
Subtotal	3,666,191
Engineering, Surveying, Construction Inspection (15%)	549,929
Total	$4,216,120

CHAPTER 6 - FEE PROJECTIONS/IMPLEMENTATION

CHAPTER 6 - FEE PROJECTIONS/IMPLEMENTATION

In making these fee projections, and implementation recommendations, no adjustment for inflation during the period of implementation of the Master Plan is included: neither has the time-value of money for the project lifespan been taken into account. Grand Total of Equivalent Single Family Dwelling units do not include areas excluded from County assessment. The total cost per Equivalent Single Family Dwelling (ESFD) (i.e. per lot or parcel) includes all construction costs.

It is recommended that the proposed City and County Planned Sewer Areas be adopted as master plans according to Section 66483 of the Government Code, that fees be collected according to Section 66007 of the Government Code, and Construction and connection of trunklines be planned. The estimated cost to construct the facilities is detailed for each Area hereinafter. Based on these figures, it is recommended that Planned Sewer Area fees be established in the amounts noted for each Service Area per EFSD. Incremental construction can be completed as funds accumulate within five years. It is also recommended that the fee be adjusted annually for inflation according to the Consumer Price Index.

For each proposed Service Area, the construction related fees are shown below. Fees for proportionate shares of trunkline capacity and wastewater treatment fees for NORSD (County areas) or the City must also be assessed; but are not addressed in this study:

County Planned Sewer Area A

Equivalent Single Family Dwellings (ESFDs):		47,429
Total Cost (from Chapter Five):	$	32,437,375
Cost per ESFD:	$	684

County Planned Sewer Area B

Equivalent Single Family Dwellings (ESFDs):		23,665
Total Cost (from Chapter Five):	$	27,401,555
Cost per ESFD:	$	1,158

City Planned Sewer Area #1

Equivalent Single Family Dwellings (ESFDs):		9,481
Total Cost (from Chapter Five):	$	10,770,685
Preliminary Cost per ESFD:	$	1,136
Kern County Contributions per ESFD:	$	340*
Cost per ESFD:	$	1,476

City Planned Sewer Area #2 **

Equivalent Single Family Dwellings (ESFDs):		3,774
Total Cost (from Chapter Five):	$	12,190,441
Cost per ESFD:	$	3,230

City Planned Sewer Area #3

Equivalent Single Family Dwellings (ESFDs):		1,964
Total Cost (from Chapter Five):	$	1,709,149
Cost per ESFD:	$	871

City Planned Sewer Area #4

Equivalent Single Family Dwellings (ESFDs):		5,075
Total Cost (from Chapter Five):	$	3,358,254
Cost per ESFD:	$	662

City Planned Sewer Area #5

Equivalent Single Family Dwellings (ESFDs):		3,438
Total Cost (from Chapter Five):	$	4,216,120
Cost per ESFD:	$	1,226

*See Appendix B for detailed cost analysis for this service area.

** See 6-2a for Modified Fee Calculation by the County of Kern.

City Planned Sewer Area #2

Modified Fee Calculation by County of Kern

At the request of the City of Bakersfield, an additional Sanitary Sewer Lift Station was added on Stockdale Highway to eliminate the need for long-force mains that historically have created maintenance issues.

S.S. Lift Station	$400,000
Real Estate Procurement	20,000
Mobilization 10%	42,000
	$462,000
Contingency 15%	69,300
	$531,000
Engineering, Surveying and Construction Inspection 15%	79,695
Total Estimated Additional Cost	$610,695
Total Cost (from Chapter Five)	$12,190,441
New Total Cost	$12,801,136
Equivalent Single Family Dwellings (ESFD's)	3,774
Cost per ESFD:	$3,400

References

REFERENCES

- Allen Road/Buena Vista Sewer Trunkline Study
  City of Bakersfield
  Carollo Engineers
  January 1997

- CSA-71 Sewer Study
  North of River Sanitary District No. 1
  Boyle Engineering Corporatin
  February 2002

- Bakersfield City Service Area No. 1
  Planned Sewer Area
  County of Kern, State of California
  March 30, 2002

- Bakersfield Metropolitan Area General Plan
  December 2002

- SewerCAD®
  Sewer Computer-Aided Design

APPENDICES

APPENDIX A

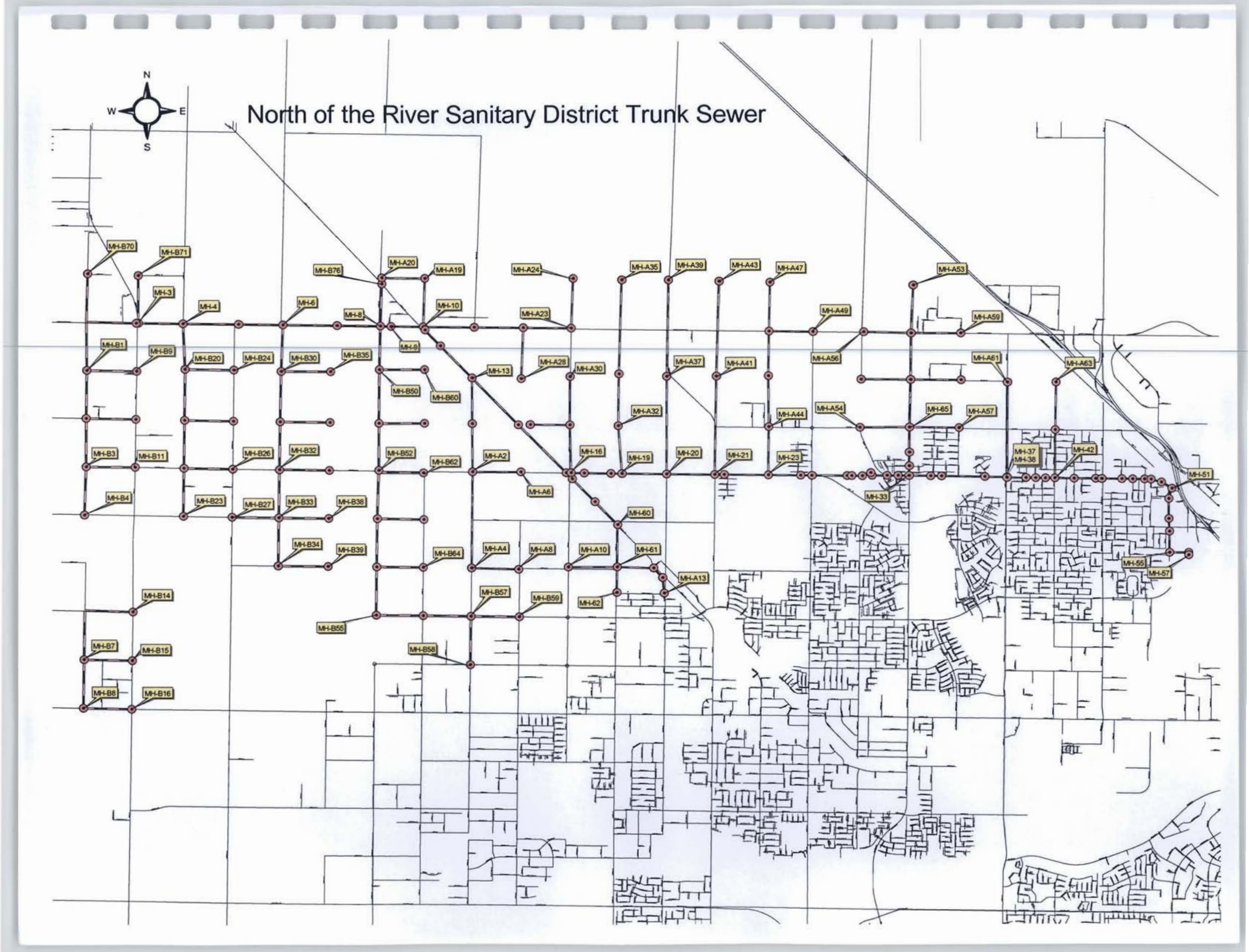
Appendix A

Trunk Line Sewer Capacity Calculations
and
Proposed Service Area Calculations

Proposed service area calculations, including ESFDs, flows, pipe sizes and lengths by reach, pump stations and force mains if required, trunk line capacity proportionate shares.

- County Planned Sewer Area A (NORSD No. 1 - Area A Trunk Sewer)
- County Planned Sewer Area B (NORSE No. 1 - Area B Trunk Sewer)
- City Planned Sewer Area No. 1 (Allen Road Trunk Sewer)
- City Planned Sewer Area No. 2 / Stockdale-Nord (Allen Road Trunk Sewer)
- City Planned Sewer Area No. 3 and Miscellaneous (El Toro Viejo Trunk Sewer)
- City Planned Sewer Area No. 4 (Buena Vista Trunk Sewer)
- City Planned Sewer Area No. 5 (Brimhall Mohawk Trunk Sewer)

County Planned Sewer Area A
(NORSD No. 1 - Area A Trunk Sewer)


North of the River Sanitary District Trunk Sewer
N
W
E
S
MH-B70
MH-B71
MH-3
MH-4
MH-6
MH-8
MH-10
MH-B76
MH-A20
MH-A19
MH-A24
MH-A23
MH-A35
MH-A39
MH-A43
MH-A47
MH-A49
MH-A53
MH-A59
MH-9
MH-13
MH-A28
MH-A30
MH-B1
MH-B9
MH-B20
MH-B24
MH-B30
MH-B35
MH-B50
MH-B60
MH-A37
MH-A41
MH-A56
MH-A61
MH-A63
MH-A32
MH-A44
MH-A54
MH-65
MH-A57
MH-B3
MH-B11
MH-B26
MH-B32
MH-B52
MH-B62
MH-A2
MH-16
MH-19
MH-20
MH-21
MH-23
MH-37
MH-38
MH-42
MH-51
MH-B4
MH-B23
MH-B27
MH-B33
MH-B38
MH-A6
MH-33
MH-60
MH-B34
MH-B39
MH-B64
MH-A4
MH-A8
MH-A10
MH-61
MH-A13
MH-55
MH-57
MH-B14
MH-B57
MH-B59
MH-62
MH-B55
MH-B7
MH-B15
MH-B58
MH-B8
MH-B16

Projected Equivalent Single Family Dwellings - County Planned Sewer Area A
North of the River Sanitary District Trunk Sewer
Project No: 02621
Date: March 20, 2004

SSMH No.	NODE No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
A19	36	28/26	32D	R-IA	21	0.00	0	CITY
		28/26	32D	GC	135	12.82	1731	CITY
						Total	1731	
A20	37	28/26	32C	R-IA	77	0.00	0	CITY
						Total	0	
A21	33	28/26	33C	R-IA	157	0.00	0	CITY
						Total	0	
A22	32	28/26	33D	R-IA	157	0.00	0	CITY
						Total	0	
A24	28	28/26	34C	R-IA	156	0.00	0	
						Total	0	
A35	27	28/26	34D	R-IA	156	0.00	0	
						Total	0	
A39	38	28/26	35C	R-IA	156	0.00	0	
						Total	0	
A43	15	28/26	35D	R-IA	156	0.00	0	
						Total	0	
A47	17	28/26	36C	R-IA	156	0.00	0	
						Total	0	
A46	16	28/26	36D	R-IA	98	0.00	0	
						Total	0	
A56	111	28/26	36D	ER	10	0.95	10	
		28/26	36D	SR	39	3.00	117	
		28/26	36D	GC	12	12.82	154	
		28/27	31C	SR	131	3.00	393	
		28/27	31C	ER	25	0.95	24	
						Total	697	
A53	110	28/27	31D	SR	110	3.00	330	
		28/27	31D	ER	25	0.95	24	
		28/27	31D	SR	5	3.00	15	
						Total	369	

SSMH No.	NODE No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots
A59	113	28/27	32C	SR	17	3.00	51
						Total	51
A21	39	29/26	4A	SI	76	17.32	1316
		29/26	4B	LI	115	17.32	1992
		29/26	4B	SI	38	17.32	658
						Total	3966
A28	30	29/26	3A	LI	133	17.32	2304
		29/26	3A	GC	20	12.82	256
						Total	2560
A30	24	29/26	3B	LMR	153	9.00	1377
						Total	1377
A33	25	29/26	2A	LMR	153	9.00	1377
						Total	1377
A37	11	29/26	2B	SR	115	3.00	345
		29/26	2B	GC	18	12.82	231
		29/26	2B	RR	10	0.40	4
						Total	580
A41	13	29/26	1A	R-MP	75	0.00	0
		29/26	1A	LMR	20	9.00	180
		29/26	1A	GC	20	12.82	256
		29/26	1A	SR	35	3.00	105
						Total	541
A45	4	29/26	1B	GC	20	12.82	256
		29/26	1B	LMR	22	9.00	198
		29/26	1B	SR	118	3.00	354
						Total	808
A55	115	29/27	6A	SR	80	3.00	240
		29/27	6A	R-IA	15	0.00	0
		29/27	6A	GC	13	12.82	167
		29/27	6A	LMR	3	9.00	27
		29/27	6A	SR	45	3.00	135
						Total	569
A51	114	29/27	6B	SR	125	3.00	375
		29/27	6B	LMR	13	9.00	117
		29/27	6B	GC	12	12.82	154
		29/27	5A	RR	109	0.40	44
		29/27	5A	R-IA	38	0.00	0
						Total	689

SSMH No.	NODE No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots
A58	116	29/27	5B	SR	138	3.00	414
						Total	414
A61	123	29/27	4A	SR	27	3.00	81
						Total	81
A1	56	29/26	4D	HMR	69	15.68	1082
						Total	1082
A31	23	29/26	4D	SI	40	17.32	693
		29/26	4D	LI	37	17.32	641
		29/26	3C	LI	153	17.32	2650
						Total	3984
A29	22	29/26	3D	HMR	50	15.68	784
				LMR	127	9.00	1143
						Total	1927
A32	20	29/26	2C	LMR	153	9.00	1377
						Total	1377
A37	10	29/26	2D	SR	160	3.00	480
						Total	480
A41	7	29/26	1C	RMP	75	0.00	0
		29/26	1C	SR	35	3.00	105
		29/26	1C	RR	40	0.40	16
						Total	121
A44	3	29/26	1D	SR	95	3.00	285
		29/26	1D	RR	60	0.40	24
						Total	309
A54	117	29/27	6C	SR	15	3.00	45
		29/27	6C	R-IA	100	0.00	0
		29/27	6C	SR	44	3.00	132
						Total	177
65	118	29/27	6D	SR	80	3.00	240
		29/27	6D	R-IA	60	0.00	0
		29/27	6D	GC	19	12.82	244
		29/27	5C	R-IA	77	0.00	0
		29/27	5C	SR	80	3.00	240
						Total	724
A57	119	29/27	5D	SR	141	3.00	423
		29/27	5D	GC	12	12.82	154
						Total	577

SSMH No.	NODE No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
A61	120	29/27	4C	SR	132	3.00	396	
		29/27	4D	SR	16	3.00	48	
						Total	444	
A2	53	29/26	9B	LMR	133	9.00	1197	
		29/26	9B	GC	10	12.82	128	
		29/26	9B	HMR	20	15.68	314	
						Total	1639	
A6	54	29/26	10A	GC	67	12.82	859	
		29/26	10A	HMR	10	15.68	157	
						Total	1016	
16	21	29/26	10A	SI	76	17.32	1316	
		29/26	10B	HMR	50	15.68	784	
		29/26	10B	LMR	107	9.00	963	
						Total	3063	
19	19	29/26	11A	LMR	153	9.00	1377	
						Total	1377	
20	9	29/26	11B	R-IA	153	0.00	0	
						Total	0	
21	6	29/26	12A	R-IA	75	0.00	0	
		29/26	12A	LR	75	6.00	450	CITY
						Total	450	
33	121	29/27	8B	R-IA	58	0.00	0	
		29/27	8B	SR	48	3.00	144	
		29/27	8C	ER	18	0.95	17	
						Total	161	
37	122	29/27	9A	SR	134	3.00	402	
		29/27	10A	LMR/LR	19	9.00	171	
		29/27	10A	SR	40	3.00	120	
		29/27	9C	SR	0	3.00	75	dry
		29/27	9C	SR	0	3.00	10	septic
		29/27	9C	SR	4	3.00	12	
						Total	790	
A4	52	29/26	9D	LMR	113	9.00	1017	
		29/26	9D	OC	40	12.82	513	
						Total	1530	

SSMH No.	NODE No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
A2	51	29/26	10C	OC	70	12.82	897	
		29/26	10C	GC	83	12.82	1064	
						Total	1961	
60	46	29/26	10D	GC	68	12.82	872	
	44	29/26	10D	HMR	50	15.68	784	
		29/26	10D	LMR	35	9.00	315	
		29/26	11C	LMR	132	9.00	1188	
		29/26	11C	GC	20	12.82	256	
						Total	3415	
20	8	29/26	11D	R-IA	153	0.00	0	
						Total	0	
21	5	29/26	12C	SR	78	3.00	234	CITY
						Total	234	
23	1	29/26	12D	SR	77	3.00	231	CITY
						Total	231	
A4	49	29/26	16B	R-IA	153	0.00	0	
						Total	0	
A8	50	29/26	15A	R-IA	153	0.00	0	
						Total	0	
A10	43	29/26	15B	R-IA	153	0.00	0	
						Total	0	
61	42	29/26	14A	R-IA	153	0.00	0	
						Total	0	
62	41	29/26	15D	R-IA	150	0.00	0	
		29/26	15D	R-MP	5	0.00	0	
		29/26	14C	SR	74	3.00	222	
		29/26	14C	R-IA	70	0.00	0	
						Total	222	
A13	-	29/26	14D	SR	0	3.00	81	dry
						Total	81	
A62	41	29/27	9B	SR	129	3.00	386	septic
		29/27	9B	GC	5	12.82	64	
						Total	450	

SSMH No.	NODE No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots
A63	-	28/27	31D	SI	20	17.32	346
		28/27	32C	SI	100	17.32	1732
		29/27	5B	LI	14	17.32	242
		29/27	4A	SI	96	17.32	1663
		29/27	4C	SI	16	17.32	277
		29/27	4D	SI	126	17.32	2182
						Total	6443
						Sub-Total	**50,075**
						City	**2,646**
						Grand Total	**47,429**

Scenario: NORSD No.1 - AREA A EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-9	O-9	MH-10	42 inch	1,804.00	0.011	0.000898	4.24	23.03	8.46	14.57
P-10	MH-10	MH-11	42 inch	199.00	0.011	0.000905	2.90	23.11	7.59	15.52
P-11	MH-11	MH-12	42 inch	1,211.00	0.011	0.000917	3.05	23.26	7.59	15.68
P-12	MH-12	MH-13	42 inch	2,464.00	0.011	0.000795	3.11	21.67	7.59	14.08
P-13	MH-13	MH-14	42 inch	3,631.00	0.011	0.000810	3.05	21.87	7.59	14.28
P-14	MH-14	MH-15	42 inch	3,718.00	0.011	0.000791	3.05	21.61	7.59	14.02
P-15	MH-15	MH-16	42 inch	255.00	0.011	0.004824	3.88	53.37	7.52	45.85
P-16	MH-16	MH-17	42 inch	728.00	0.011	0.000865	3.79	22.61	7.52	15.09
P-17	MH-17	MH-18	42 inch	1,460.00	0.011	0.000904	3.16	23.11	7.52	15.59
P-18	MH-18	MH-19	36 inch	604.00	0.011	0.003212	4.22	28.87	7.52	21.35
P-19	MH-19	MH-20	36 inch	2,408.00	0.011	0.002400	4.64	24.96	7.52	17.44
P-20	MH-20	MH-21	36 inch	2,633.00	0.011	0.002397	4.52	24.94	7.52	17.42
P-21	MH-21	MH-22	36 inch	503.00	0.011	0.002326	4.50	24.57	7.52	17.05
P-22	MH-22	MH-23	36 inch	2,401.00	0.011	0.002299	4.44	24.43	7.45	16.97
P-23	MH-23	MH-24	36 inch	1,790.00	0.011	0.002313	4.27	24.50	6.96	17.54
P-24	MH-24	MH-25	36 inch	612.00	0.011	0.002255	4.26	24.19	6.74	17.45
P-25	MH-25	MH-26	36 inch	1,903.00	0.011	0.001997	4.18	22.76	6.74	16.03
P-26	MH-26	MH-27	36 inch	246.00	0.011	0.001870	4.05	22.03	6.74	15.29
P-27	MH-27	MH-28	36 inch	584.00	0.011	0.002055	4.09	23.09	6.74	16.35
P-28	MH-28	MH-29	36 inch	483.00	0.011	0.002547	4.32	25.71	6.74	18.97
P-29	MH-29	MH-30	36 inch	164.00	0.011	0.023476	4.55	78.05	6.74	71.31
P-30	MH-30	MH-31	36 inch	822.00	0.011	0.002311	4.45	24.49	6.74	17.75
P-31	MH-31	MH-32	36 inch	602.00	0.011	0.002292	4.31	24.39	6.74	17.65
P-32	MH-32	MH-33	36 inch	590.00	0.011	0.002288	4.30	24.37	6.74	17.63
P-33	MH-33	MH-34	36 inch	1,158.00	0.011	0.002288	4.20	24.37	6.48	17.89
P-34	MH-34	MH-35	36 inch	592.00	0.011	0.002331	4.21	24.60	6.35	18.25
P-35	MH-35	MH-36	30 inch	2,390.00	0.011	0.002310	4.50	15.06	6.30	8.76
P-36	MH-36	MH-37	36 inch	1,202.00	0.011	0.002296	4.02	24.41	6.27	18.14
P-37	MH-37	MH-38	36 inch	24.00	0.011	0.002500	4.07	25.47	6.27	19.20
P-38	MH-38	MH-39	33 inch	1,037.00	0.011	0.003047	4.42	22.30	6.27	16.02
P-39	MH-39	MH-40	33 inch	530.00	0.011	0.002736	4.56	21.13	6.27	14.85
P-40	MH-40	MH-41	33 inch	531.00	0.011	0.005574	4.57	30.16	6.27	23.89
P-41	MH-41	MH-42	33 inch	522.00	0.011	0.003352	4.61	23.39	6.27	17.11
P-42	MH-42	MH-43	33 inch	1,069.00	0.011	0.001160	3.91	13.76	6.27	7.48
P-43	MH-43	MH-44	33 inch	1,187.00	0.011	0.002805	4.01	21.40	6.27	15.12
P-44	MH-44	MH-45	33 inch	326.00	0.011	0.002791	4.55	21.34	6.27	15.07
P-45	MH-45	MH-46	33 inch	1,077.00	0.011	0.002303	4.37	19.38	6.25	13.13
P-46	MH-46	MH-47	33 inch	604.00	0.011	0.002285	4.24	19.31	6.25	13.06
P-47	MH-47	MH-48	33 inch	653.00	0.011	0.002312	4.25	19.42	6.25	13.17
P-48	MH-48	MH-49	33 inch	371.00	0.011	0.002291	4.25	19.33	6.25	13.08
P-49	MH-49	MH-50	33 inch	592.00	0.011	0.002314	4.25	19.43	6.25	13.18
P-50	MH-50	MH-51	33 inch	668.00	0.011	0.002350	4.27	19.58	6.25	13.33
P-51	MH-51	MH-52	33 inch	588.00	0.011	0.001207	3.79	14.04	6.25	7.79
P-52	MH-52	MH-53	33 inch	1,104.00	0.011	0.001196	3.38	13.97	6.25	7.72
P-53	MH-53	MH-54	33 inch	696.00	0.011	0.001193	3.37	13.95	6.25	7.70
P-54	MH-54	MH-55	33 inch	1,168.00	0.011	0.001199	3.37	13.98	6.25	7.73
P-55	MH-55	MH-56	33 inch	1,056.00	0.011	0.001203	3.38	14.01	6.25	7.76
P-56	MH-56	MH-57	21 inch	128.00	0.011	0.052266	5.23	27.67	6.25	21.42
P-57	MH-15	MH-58	18 inch	462.00	0.011	0.000779	0.51	2.24	0.07	2.17
P-58	MH-58	MH-59	18 inch	1,780.00	0.011	0.000820	0.67	2.30	0.07	2.23
P-59	MH-59	MH-60	18 inch	1,773.00	0.011	0.000818	0.69	2.29	0.07	2.22

Scenario: NORSD No.1 - AREA A EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-60	MH-60	MH-61	15 inch	2,325.00	0.011	0.001157	1.36	1.68	0.07	1.61
P-61	MH-61	MH-62	15 inch	1,401.00	0.011	0.001156	0.80	1.68	0.07	1.61
P-62	MH-33	MH-63	21 inch	534.00	0.011	0.001199	1.87	4.19	0.26	3.93
P-63	MH-63	MH-64	21 inch	752.00	0.011	0.001197	1.25	4.19	0.26	3.92
P-64	MH-64	MH-65	21 inch	1,387.00	0.011	0.001204	0.37	4.20	0.02	4.18
P-A1	MH-13	MH-A1	30 inch	2,640.00	0.013	0.000799	0.00	7.49	0.00	7.49
P-A2	MH-A1	MH-A2	27 inch	2,640.00	0.010	0.000799	0.00	7.36	0.00	7.36
P-A4	MH-A2	MH-A4	18 inch	5,280.00	0.013	0.001199	0.00	2.35	0.00	2.35
P-A6	MH-A2	MH-A6	12 inch	2,640.00	0.013	0.002197	0.00	1.08	0.00	1.08
P-A8	MH-A4	MH-A8	15 inch	2,640.00	0.013	0.002201	0.00	1.96	0.00	1.96
P-A10	MH-61	MH-A10	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A11	MH-61	MH-A11	12 inch	1,972.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A12	MH-A11	MH-A12	12 inch	710.00	0.013	0.002197	0.00	1.08	0.00	1.08
P-A13	MH-A12	MH-A13	12 inch	860.00	0.013	0.002651	0.00	1.19	0.00	1.19
P-A19	MH-10	MH-A19	12 inch	2,640.00	0.013	0.002197	0.00	1.08	0.00	1.08
P-A20	MH-A19	MH-A20	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A21	MH-10	MH-A21	24 inch	2,640.00	0.013	0.000799	0.00	4.13	0.00	4.13
P-A22	MH-A21	MH-A22	18 inch	2,640.00	0.013	0.001197	0.00	2.35	0.00	2.35
P-A23	MH-A22	MH-A23	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A24	MH-A23	MH-A24	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A28	MH-A22	MH-A28	15 inch	2,640.00	0.013	0.001598	0.00	1.67	0.00	1.67
P-A29	MH-16	MH-A29	24 inch	2,640.00	0.013	0.000799	0.00	4.13	0.00	4.13
P-A30	MH-A29	MH-A30	12 inch	2,640.00	0.013	0.002197	0.00	1.08	0.00	1.08
P-A31	MH-A29	MH-A31	18 inch	2,640.00	0.013	0.001201	0.00	2.35	0.00	2.35
P-A32	MH-19	MH-A32	18 inch	2,640.00	0.013	0.001201	0.00	2.35	0.00	2.35
P-A33	MH-A32	MH-A33	15 inch	2,640.00	0.013	0.001598	0.00	1.67	0.00	1.67
P-A35	MH-A33	MH-A35	12 inch	5,280.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A37	MH-20	MH-A37	15 inch	5,280.00	0.013	0.001600	0.00	1.67	0.00	1.67
P-A39	MH-A37	MH-A39	12 inch	5,280.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A41	MH-21	MH-A41	15 inch	5,280.00	0.013	0.001600	0.00	1.67	0.00	1.67
P-A43	MH-A41	MH-A43	12 inch	5,280.00	0.013	0.002205	0.00	1.08	0.00	1.08
P-A44	MH-23	MH-A44	18 inch	2,640.00	0.013	0.001201	0.00	2.35	0.00	2.35
P-A45	MH-A44	MH-A45	15 inch	2,640.00	0.013	0.001598	0.00	1.67	0.00	1.67
P-A46	MH-A45	MH-A46	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A47	MH-A46	MH-A47	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A49	MH-A46	MH-A49	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A51	MH-65	MH-A51	21 inch	2,640.00	0.013	0.001000	0.00	3.24	0.00	3.24
P-A52	MH-A51	MH-A52	18 inch	2,640.00	0.013	0.001201	0.00	2.35	0.00	2.35
P-A53	MH-A52	MH-A53	12 inch	2,640.00	0.013	0.002208	0.00	1.08	0.00	1.08
P-A54	MH-65	MH-A54	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A55	MH-A51	MH-A55	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A56	MH-A52	MH-A56	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A57	MH-65	MH-A57	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A58	MH-A51	MH-A58	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A59	MH-A52	MH-A59	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A61	MH-37	MH-A61	12 inch	5,280.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A62	MH-42	MH-A62	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A63	MH-A62	MH-A63	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08

Scenario: NORSD No. 1 - AREA A FUTURE LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-9	O-9	MH-10	42 inch	1,804.00	0.011	0.000898	5.61	23.03	34.90	-11.87
P-10	MH-10	MH-11	42 inch	199.00	0.011	0.000905	4.75	23.11	29.52	-6.40
P-11	MH-11	MH-12	42 inch	1,211.00	0.011	0.000917	4.75	23.26	29.52	-6.25
P-12	MH-12	MH-13	42 inch	2,464.00	0.011	0.000795	4.75	21.67	29.52	-7.84
P-13	MH-13	MH-14	42 inch	3,631.00	0.011	0.000810	4.19	21.87	26.03	-4.16
P-14	MH-14	MH-15	42 inch	3,718.00	0.011	0.000791	4.19	21.61	26.03	-4.42
P-15	MH-15	MH-16	42 inch	255.00	0.011	0.004824	3.90	53.37	24.27	29.10
P-16	MH-16	MH-17	42 inch	728.00	0.011	0.000865	3.04	22.61	18.92	3.69
P-17	MH-17	MH-18	42 inch	1,460.00	0.011	0.000904	3.04	23.11	18.92	4.19
P-18	MH-18	MH-19	36 inch	604.00	0.011	0.003212	4.14	28.87	18.92	9.95
P-19	MH-19	MH-20	36 inch	2,408.00	0.011	0.002400	3.69	24.96	16.84	8.12
P-20	MH-20	MH-21	36 inch	2,633.00	0.011	0.002397	4.15	24.94	16.30	8.64
P-21	MH-21	MH-22	36 inch	503.00	0.011	0.002326	5.01	24.57	15.63	8.94
P-22	MH-22	MH-23	36 inch	2,401.00	0.011	0.002299	5.49	24.43	15.56	8.87
P-23	MH-23	MH-24	36 inch	1,790.00	0.011	0.002313	5.24	24.50	14.39	10.11
P-24	MH-24	MH-25	36 inch	612.00	0.011	0.002255	5.31	24.19	14.17	10.02
P-25	MH-25	MH-26	36 inch	1,903.00	0.011	0.001997	5.19	22.76	14.17	8.60
P-26	MH-26	MH-27	36 inch	246.00	0.011	0.001870	4.99	22.03	14.17	7.86
P-27	MH-27	MH-28	36 inch	584.00	0.011	0.002055	5.03	23.09	14.17	8.93
P-28	MH-28	MH-29	36 inch	483.00	0.011	0.002547	5.36	25.71	14.17	11.54
P-29	MH-29	MH-30	36 inch	164.00	0.011	0.023476	5.76	78.05	14.17	63.89
P-30	MH-30	MH-31	36 inch	822.00	0.011	0.002311	5.62	24.49	14.17	10.33
P-31	MH-31	MH-32	36 inch	602.00	0.011	0.002292	5.35	24.39	14.17	10.22
P-32	MH-32	MH-33	36 inch	590.00	0.011	0.002288	5.34	24.37	14.17	10.20
P-33	MH-33	MH-34	36 inch	1,158.00	0.011	0.002288	4.74	24.37	11.61	12.76
P-34	MH-34	MH-35	36 inch	592.00	0.011	0.002331	5.04	24.60	11.48	13.12
P-35	MH-35	MH-36	30 inch	2,390.00	0.011	0.002310	5.40	15.06	11.43	3.63
P-36	MH-36	MH-37	36 inch	1,202.00	0.011	0.002296	4.58	24.41	10.83	13.58
P-37	MH-37	MH-38	36 inch	24.00	0.011	0.002500	4.54	25.47	10.17	15.30
P-38	MH-38	MH-39	33 inch	1,037.00	0.011	0.003047	5.09	22.30	10.11	12.19
P-39	MH-39	MH-40	33 inch	530.00	0.011	0.002736	5.30	21.13	10.11	11.02
P-40	MH-40	MH-41	33 inch	531.00	0.011	0.005574	5.32	30.16	10.11	20.05
P-41	MH-41	MH-42	33 inch	522.00	0.011	0.003352	5.42	23.39	10.11	13.28
P-42	MH-42	MH-43	33 inch	1,069.00	0.011	0.001160	3.35	13.76	6.27	7.48
P-43	MH-43	MH-44	33 inch	1,187.00	0.011	0.002805	4.01	21.40	6.27	15.12
P-44	MH-44	MH-45	33 inch	326.00	0.011	0.002791	4.55	21.34	6.27	15.07
P-45	MH-45	MH-46	33 inch	1,077.00	0.011	0.002303	4.37	19.38	6.25	13.13
P-46	MH-46	MH-47	33 inch	604.00	0.011	0.002285	4.24	19.31	6.25	13.06
P-47	MH-47	MH-48	33 inch	653.00	0.011	0.002312	4.25	19.42	6.25	13.17
P-48	MH-48	MH-49	33 inch	371.00	0.011	0.002291	4.25	19.33	6.25	13.08
P-49	MH-49	MH-50	33 inch	592.00	0.011	0.002314	4.25	19.43	6.25	13.18
P-50	MH-50	MH-51	33 inch	668.00	0.011	0.002350	4.27	19.58	6.25	13.33
P-51	MH-51	MH-52	33 inch	588.00	0.011	0.001207	3.79	14.04	6.25	7.79
P-52	MH-52	MH-53	33 inch	1,104.00	0.011	0.001196	3.38	13.97	6.25	7.72
P-53	MH-53	MH-54	33 inch	696.00	0.011	0.001193	3.37	13.95	6.25	7.70
P-54	MH-54	MH-55	33 inch	1,168.00	0.011	0.001199	3.37	13.98	6.25	7.73
P-55	MH-55	MH-56	33 inch	1,056.00	0.011	0.001203	3.38	14.01	6.25	7.76
P-56	MH-56	MH-57	21 inch	128.00	0.011	0.052266	5.23	27.67	6.25	21.42
P-57	MH-15	MH-58	18 inch	462.00	0.011	0.000779	1.54	2.24	1.75	0.49
P-58	MH-58	MH-59	18 inch	1,780.00	0.011	0.000820	1.54	2.30	1.75	0.54
P-59	MH-59	MH-60	18 inch	1,773.00	0.011	0.000818	1.54	2.29	1.75	0.54

Scenario: NORSD No. 1 - AREA A FUTURE LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-60	MH-60	MH-61	15 inch	2,325.00	0.011	0.001157	0.14	1.68	0.11	1.57
P-61	MH-61	MH-62	15 inch	1,401.00	0.011	0.001156	0.09	1.68	0.07	1.61
P-62	MH-33	MH-63	21 inch	534.00	0.011	0.001199	3.48	4.19	2.48	1.71
P-63	MH-63	MH-64	21 inch	752.00	0.011	0.001197	2.65	4.19	2.48	1.71
P-64	MH-64	MH-65	21 inch	1,387.00	0.011	0.001204	2.45	4.20	2.17	2.03
P-A1	MH-13	MH-A1	30 inch	2,640.00	0.013	0.000799	1.10	7.49	3.49	4.01
P-A2	MH-A1	MH-A2	27 inch	2,640.00	0.010	0.000799	1.19	7.36	3.05	4.31
P-A4	MH-A2	MH-A4	18 inch	5,280.00	0.013	0.001199	1.26	2.35	0.77	1.58
P-A6	MH-A2	MH-A6	12 inch	2,640.00	0.013	0.002197	1.53	1.08	0.50	0.58
P-A8	MH-A4	MH-A8	15 inch	2,640.00	0.013	0.002201	0.00	1.96	0.00	1.96
P-A10	MH-61	MH-A10	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A11	MH-61	MH-A11	12 inch	1,972.00	0.013	0.002201	0.08	1.08	0.04	1.04
P-A12	MH-A11	MH-A12	12 inch	710.00	0.013	0.002197	0.50	1.08	0.04	1.04
P-A13	MH-A12	MH-A13	12 inch	860.00	0.013	0.002651	1.01	1.19	0.04	1.14
P-A19	MH-10	MH-A19	12 inch	2,640.00	0.013	0.002197	1.72	1.08	0.87	0.21
P-A20	MH-A19	MH-A20	12 inch	2,640.00	0.013	0.002201	0.19	1.08	1.62e-3	1.08
P-A21	MH-10	MH-A21	24 inch	2,640.00	0.013	0.000799	1.79	4.13	3.64	0.49
P-A22	MH-A21	MH-A22	18 inch	2,640.00	0.013	0.001197	1.29	2.35	1.42	0.93
P-A23	MH-A22	MH-A23	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A24	MH-A23	MH-A24	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A28	MH-A22	MH-A28	15 inch	2,640.00	0.013	0.001598	2.22	1.67	1.42	0.25
P-A29	MH-16	MH-A29	24 inch	2,640.00	0.013	0.000799	1.88	4.13	3.82	0.32
P-A30	MH-A29	MH-A30	12 inch	2,640.00	0.013	0.002197	1.37	1.08	0.69	0.39
P-A31	MH-A29	MH-A31	18 inch	2,640.00	0.013	0.001201	1.95	2.35	2.23	0.12
P-A32	MH-19	MH-A32	18 inch	2,640.00	0.013	0.001201	1.22	2.35	1.39	0.96
P-A33	MH-A32	MH-A33	15 inch	2,640.00	0.013	0.001598	0.88	1.67	0.69	0.98
P-A35	MH-A33	MH-A35	12 inch	5,280.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A37	MH-20	MH-A37	15 inch	5,280.00	0.013	0.001600	1.27	1.67	0.53	1.14
P-A39	MH-A37	MH-A39	12 inch	5,280.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A41	MH-21	MH-A41	15 inch	5,280.00	0.013	0.001600	1.69	1.67	0.33	1.34
P-A43	MH-A41	MH-A43	12 inch	5,280.00	0.013	0.002205	0.00	1.08	0.00	1.08
P-A44	MH-23	MH-A44	18 inch	2,640.00	0.013	0.001201	2.25	2.35	0.56	1.79
P-A45	MH-A44	MH-A45	15 inch	2,640.00	0.013	0.001598	1.99	1.67	0.41	1.26
P-A46	MH-A45	MH-A46	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A47	MH-A46	MH-A47	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A49	MH-A46	MH-A49	12 inch	2,640.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-A51	MH-65	MH-A51	21 inch	2,640.00	0.013	0.001000	1.78	3.24	1.41	1.83
P-A52	MH-A51	MH-A52	18 inch	2,640.00	0.013	0.001201	1.43	2.35	0.56	1.79
P-A53	MH-A52	MH-A53	12 inch	2,640.00	0.013	0.002208	1.91	1.08	0.19	0.90
P-A54	MH-65	MH-A54	12 inch	2,640.00	0.013	0.002201	1.56	1.08	0.09	0.99
P-A55	MH-A51	MH-A55	12 inch	2,640.00	0.013	0.002201	2.16	1.08	0.29	0.79
P-A56	MH-A52	MH-A56	12 inch	2,640.00	0.013	0.002201	2.29	1.08	0.35	0.73
P-A57	MH-65	MH-A57	12 inch	2,640.00	0.013	0.002201	2.17	1.08	0.29	0.79
P-A58	MH-A51	MH-A58	12 inch	2,640.00	0.013	0.002201	1.98	1.08	0.21	0.87
P-A59	MH-A52	MH-A59	12 inch	2,640.00	0.013	0.002201	1.11	1.08	0.03	1.05
P-A61	MH-37	MH-A61	12 inch	5,280.00	0.013	0.002201	2.11	1.08	0.26	0.82
P-A62	MH-42	MH-A62	12 inch	2,640.00	0.013	0.002201	7.62	1.08	3.83	-2.75
P-A63	MH-A62	MH-A63	12 inch	2,640.00	0.013	0.002201	7.11	1.08	3.61	-2.53

County Planned Sewer Area B
(NORSD No. 1 - Area B Trunk Sewer)

Projected Equivalent Single Family Dwellings - County Planned Sewer Area B
North of the River Sanitary District Trunk Sewer
Project No: 02621
Date: March 20, 2004

MANHOLE NUMBER	NODE No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots
B1	102	29/25	2B	R-IA	115	0.00	0
		29/25	2B	R-MP	38	0.00	0
						Total	0
B2	99	29/25	2D	R-IA	134	0.00	0
		29/25	2D	RR	15	0.40	6
		29/25	2D	UER	5	1.33	7
						Total	13
B3	98	29/25	11B	R-IA	152	0.00	0
						Total	0
B4	95	29/25	11D	R-IA	152	0.00	0
		29/25	11D	PS	8	3.50	28
						Total	28
B5	94	29/25	14B	R-IA	157	0.00	0
						Total	0
B6	-	29/25	14D	R-IA	157	0.00	0
						Total	0
B7	-	29/25	23B	-	0	0.00	0
						Total	0
B8	-	29/25	23D	-	0	0.00	0
						Total	0
B9	101	29/26	1A	R-MP	57	0.00	0
		29/26	1A	R-IA	96	0.00	0
						Total	0
B10	100	29/26	1C	R-IA	103	0.00	0
		29/26	1C	R-MP	53	0.00	0
						Total	0
B11	97	29/26	12A	R-IA	94	0.00	0
		29/26	12A	R-MP	66	0.00	0
						Total	0
-	96	29/26	12C	R-IA	160	0.00	0
						Total	0

MANHOLE NUMBER	NODE No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots
-	93	29/26	13A	R-IA	160	0.00	0
						Total	0
B14	-	29/25	23B	ER	75	0.95	71
		29/25	23B	GC	10	12.82	128
		29/26	13C	R-IA	160	0.00	0
						Total	199
B15	-	29/25	23B	ER	75	0.95	71
		29/25	23D	ER	43	0.95	41
		29/25	23D	R-IA	30	0.00	0
		29/26	24A	R-IA	160	0.00	0
						Total	112
B16	-	29/25	23D	ER	43	0.95	41
		29/25	23D	R-IA	30	0.00	0
		29/25	23D	GC	2	12.82	26
		29/26	24C	GC	1	12.82	13
		29/26	24C	RR	18	0.40	7
		29/26	24C	R-MP	19	0.00	0
		29/26	13C	R-IA	109	0.00	0
						Total	87
B20	92	29/26	1B	R-IA	160	0.00	0
						Total	0
B21	89	29/26	1D	R-IA	110	0.00	0
		29/26	1D	R-MP	55	0.00	0
						Total	0
B22	88	29/26	12B	R-MP	160	0.00	0
						Total	0
B23	85	29/26	12D	R-IA	73	0.00	0
		29/26	12D	R-MP	75	0.00	0
	84	29/26	13B	R-MP	86	0.00	0
		29/26	13B	R-IA	74	0.00	0
						Total	0
B24	91	29/26	6A	SR	160	3.00	480
						Total	480
B25	90	29/26	6C	SR	160	3.00	480
						Total	480
B26	87	29/26	7A	SR	160	3.00	480
						Total	480

MANHOLE NUMBER	NODE No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots
B27	86	29/26	7C	ER	150	0.95	143
		29/26	7C	SR	10	3.00	30
						Total	173
B30	83	29/26	6B	SR	129	3.00	387
		29/26	6B	R-IA	18	0.00	0
						Total	387
B31	80	29/26	6D	R-IA	160	0.00	0
						Total	0
B32	79	29/26	7B	SR	157	3.00	471
						Total	471
B33	-	29/26	7D	ER	24	0.95	23
		29/26	7D	SR	132	3.00	396
						Total	419
B34	-	29/26	18A	ER	160	0.95	152
		29/26	18B	ER	160	0.95	152
						Total	304
B35	82	29/26	5A	SR	160	3.00	480
						Total	480
B36	81	29/26	5C	SR	160	3.00	480
						Total	480
B37	78	29/26	8A	LMR	160	9.00	1440
						Total	1440
B38	-	29/26	8C	LMR	160	9.00	1440
						Total	1440
B39	-	29/26	17A	SR	160	3.00	480
		29/26	18D	ER	40	0.95	38
		29/26	17C	ER	160	0.95	152
						Total	670
B50	75	29/26	5B	LMR	160	9.00	1440
						Total	1440
B51	72	29/26	5D	LMR	140	9.00	1260
		29/26	5D	GC	15	12.82	192
						Total	1452
B52	71	29/26	8B	LMR	160	9.00	1440
						Total	1440

MANHOLE NUMBER	NODE No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots
B53	107	29/26	8D	R-IA	156	0.00	0
						Total	0
B54	-	29/26	17B	LMR	141	9.00	1269
		29/26	17B	GC	16	12.82	205
						Total	1474
B55	-	29/26	17D	SR	88	3.00	264
		29/26	17D	RR	39	0.40	16
		29/26	17D	ER	34	0.95	32
						Total	312
B56	-	29/26	16C	R-IA	155	0.00	0
						Total	0
B57	-	29/26	16D	R-IA	153	0.00	0
						Total	0
B58	-	29/26	21A	SI	5	17.32	87
		29/26	21A	ER	126	0.95	120
		29/26	21A	UER	29	1.33	39
		29/26	21B	UER	116	1.33	154
		29/26	21B	RR	35	0.40	14
						Total	413
B59	-	29/26	22A	UER	158	1.33	210
						Total	210
B60	-	29/26	4A	LMR	33	9.00	297
		29/26	4A	HMR	34	15.68	533
						Total	830
B61	-	29/26	4C	HMR	30	15.68	470
		29/26	4C	LMR	130	9.00	1170
						Total	1640
B62	-	29/26	9A	LMR	160	9.00	1440
						Total	1440
B63	-	29/26	9C	LMR	153	9.00	1377
						Total	1377
B64	-	29/26	16A	R-IA	157	0.00	0
						Total	0
B70	124	28/25	35C	HI	151	17.32	2615
						Total	2615

MANHOLE NUMBER	NODE No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots
B71	66	28/25	35D	SI	41	17.32	710
		28/25	35D	R-IA	112	0.00	0
						Total	710
B72	65	28/25	36C	R-IA	158	0.00	0
						Total	0
B73	62	28/25	36D	R-IA	158	0.00	0
						Total	0
B74	61	28/26	31C	R-IA	169	0.00	0
						Total	0
B75	58	28/26	31D	R-IA	155	0.00	0
						Total	0
B76	68	28/26	32C	ER	3	0.95	3
		28/26	32C	SI	9	17.32	156
		28/26	32C	R-IA	36	0.00	0
		28/26	32C	RR	23	0.40	9
						Total	168
						Grand Total	**23,665**

Scenario: NORSD No.1 AREA B - EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-1	O-1	MH-2	48 inch	2,752.00	0.011	0.000650	3.06	27.98	8.54	19.44
P-2	MH-2	MH-3	48 inch	108.00	0.011	0.000648	2.80	27.93	8.54	19.39
P-3	MH-3	MH-4	48 inch	2,422.00	0.011	0.000652	2.80	28.02	8.46	19.56
P-4	MH-4	MH-5	48 inch	3,002.00	0.011	0.000650	2.89	27.96	8.46	19.50
P-5	MH-5	MH-6	42 inch	2,400.00	0.011	0.001108	3.36	25.58	8.46	17.12
P-6	MH-6	MH-7	42 inch	3,002.00	0.011	0.000899	3.39	23.05	8.46	14.58
P-7	MH-7	MH-8	42 inch	2,403.00	0.011	0.000899	3.28	23.04	8.46	14.58
P-8	MH-8	MH-9	42 inch	591.00	0.011	0.000914	3.26	23.23	8.46	14.77
P-B1	O-1	MH-B1	24 inch	2,670.00	0.013	0.000787	0.00	4.10	0.00	4.10
P-B2	MH-B1	MH-B2	21 inch	2,639.00	0.013	0.000985	0.00	3.21	0.00	3.21
P-B3	MH-B2	MH-B3	18 inch	2,675.00	0.013	0.001200	0.00	2.35	0.00	2.35
P-B4	MH-B3	MH-B4	18 inch	2,652.00	0.013	0.001203	0.00	2.35	0.00	2.35
P-B7	O-B6	MH-B7	12 inch	2,681.00	0.013	0.002178	0.00	1.07	0.00	1.07
P-B8	MH-B7	MH-B8	12 inch	2,656.00	0.013	0.002199	0.00	1.08	0.00	1.08
P-B9	MH-B1	MH-B9	12 inch	2,742.00	0.013	0.002199	0.00	1.08	0.00	1.08
P-B10	MH-B2	MH-B10	12 inch	2,735.00	0.013	0.002212	0.00	1.08	0.00	1.08
P-B11	MH-B3	MH-B11	12 inch	2,698.00	0.013	0.002202	0.00	1.08	0.00	1.08
P-B14	O-B6	MH-B14	10 inch	2,636.00	0.013	0.002807	0.00	0.75	0.00	0.75
P-B15	MH-B7	MH-B15	10 inch	2,638.00	0.013	0.002801	0.00	0.75	0.00	0.75
P-B16	MH-B8	MH-B16	10 inch	2,642.00	0.013	0.002801	0.00	0.75	0.00	0.75
P-B20	MH-4	MH-B20	21 inch	2,510.00	0.013	0.001000	0.00	3.24	0.00	3.24
P-B21	MH-B20	MH-B21	21 inch	2,802.00	0.013	0.001003	0.00	3.24	0.00	3.24
P-B22	MH-B21	MH-B22	18 inch	2,642.00	0.013	0.001211	0.00	2.36	0.00	2.36
P-B23	MH-B22	MH-B23	15 inch	2,648.00	0.013	0.001586	0.00	1.66	0.00	1.66
P-B24	MH-B20	MH-B24	12 inch	2,642.00	0.013	0.002195	0.00	1.08	0.00	1.08
P-B25	MH-B21	MH-B25	12 inch	2,639.00	0.013	0.002198	0.00	1.08	0.00	1.08
P-B26	MH-B22	MH-B26	12 inch	2,642.00	0.013	0.002199	0.00	1.08	0.00	1.08
P-B27	MH-B33	MH-B27	12 inch	2,508.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-B30	MH-6	MH-B30	24 inch	2,553.00	0.013	0.000823	0.00	4.19	0.00	4.19
P-B31	MH-B30	MH-B31	18 inch	2,779.00	0.013	0.001151	0.00	2.30	0.00	2.30
P-B32	MH-B31	MH-B32	15 inch	2,640.00	0.013	0.001591	0.00	1.67	0.00	1.67
P-B33	O-B32	MH-B33	15 inch	2,670.00	0.013	0.001599	0.00	1.67	0.00	1.67
P-B34	MH-B33	MH-B34	15 inch	2,648.00	0.013	0.001601	0.00	1.67	0.00	1.67
P-B35	MH-B30	MH-B35	12 inch	2,750.00	0.013	0.002200	0.00	1.08	0.00	1.08
P-B36	MH-B31	MH-B36	12 inch	2,772.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-B37	O-B32	MH-B37	12 inch	2,777.00	0.013	0.002200	0.00	1.08	0.00	1.08
P-B38	MH-B33	MH-B38	12 inch	2,780.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-B39	MH-B34	MH-B39	12 inch	2,772.00	0.013	0.002201	0.00	1.08	0.00	1.08
P-B50	MH-8	MH-B50	24 inch	2,385.00	0.013	0.000881	0.00	4.34	0.00	4.34
P-B51	MH-B50	MH-B51	21 inch	2,964.00	0.013	0.000877	0.00	3.03	0.00	3.03
P-B52	MH-B51	MH-B52	18 inch	2,591.00	0.013	0.001235	0.00	2.39	0.00	2.39
P-B53	O-B52	MH-B53	15 inch	2,543.00	0.013	0.001600	0.00	1.67	0.00	1.67
P-B54	MH-B53	MH-B54	15 inch	2,655.00	0.013	0.001601	0.00	1.67	0.00	1.67
P-B55	MH-B54	MH-B55	15 inch	2,652.00	0.013	0.001614	0.00	1.68	0.00	1.68
P-B56	MH-B55	MH-B56	15 inch	2,617.00	0.013	0.001605	0.00	1.67	0.00	1.67
P-B57	MH-B56	MH-B57	15 inch	2,621.00	0.013	0.001602	0.00	1.67	0.00	1.67
P-B58	MH-B57	MH-B58	12 inch	2,645.00	0.013	0.002212	0.00	1.08	0.00	1.08
P-B59	MH-B57	MH-B59	12 inch	2,655.00	0.013	0.002203	0.00	1.08	0.00	1.08
P-B60	MH-B50	MH-B60	12 inch	2,524.00	0.013	0.002298	0.00	1.10	0.00	1.10
P-B61	MH-B51	MH-B61	12 inch	2,539.00	0.013	0.002202	0.00	1.08	0.00	1.08
P-B62	O-B52	MH-B62	12 inch	2,497.00	0.013	0.002199	0.00	1.08	0.00	1.08
P-B63	MH-B53	MH-B63	12 inch	2,596.00	0.013	0.002188	0.00	1.08	0.00	1.08

Scenario: NORSD No.1 AREA B - EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-B64	MH-B54	MH-B64	12 inch	2,598.00	0.013	0.002194	0.00	1.08	0.00	1.08
P-B70	O-1	MH-B70	12 inch	2,639.00	0.013	0.002236	0.00	1.09	0.00	1.09
P-B71	MH-3	MH-B71	12 inch	2,610.00	0.013	0.002222	0.00	1.09	0.00	1.09
P-B76	MH-8	MH-B76	12 inch	2,319.00	0.013	0.002199	0.00	1.08	0.00	1.08

Scenario: NORSD No. 1 AREA B - FUTURE LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-1	O-1	MH-2	48 inch	2,752.00	0.011	0.000650	5.58	27.98	45.32	-17.34
P-2	MH-2	MH-3	48 inch	108.00	0.011	0.000648	5.58	27.93	45.32	-17.39
P-3	MH-3	MH-4	48 inch	2,422.00	0.011	0.000652	5.52	28.02	44.84	-16.82
P-4	MH-4	MH-5	48 inch	3,002.00	0.011	0.000650	5.43	27.96	44.12	-16.16
P-5	MH-5	MH-6	42 inch	2,400.00	0.011	0.001108	7.09	25.58	44.12	-18.53
P-6	MH-6	MH-7	42 inch	3,002.00	0.011	0.000899	6.59	23.05	40.96	-17.91
P-7	MH-7	MH-8	42 inch	2,403.00	0.011	0.000899	6.59	23.04	40.96	-17.92
P-8	MH-8	MH-9	42 inch	591.00	0.011	0.000914	5.61	23.23	34.90	-11.67
P-B1	O-1	MH-B1	24 inch	2,670.00	0.013	0.000787	0.64	4.10	0.28	3.82
P-B2	MH-B1	MH-B2	21 inch	2,639.00	0.013	0.000985	1.77	3.21	0.28	2.94
P-B3	MH-B2	MH-B3	18 inch	2,675.00	0.013	0.001200	1.84	2.35	0.27	2.08
P-B4	MH-B3	MH-B4	18 inch	2,652.00	0.013	0.001203	1.17	2.35	0.27	2.08
P-B7	O-B6	MH-B7	12 inch	2,681.00	0.013	0.002178	1.61	1.07	0.10	0.97
P-B8	MH-B7	MH-B8	12 inch	2,656.00	0.013	0.002199	0.69	1.08	0.04	1.04
P-B9	MH-B1	MH-B9	12 inch	2,742.00	0.013	0.002199	0.00	1.08	0.00	1.08
P-B10	MH-B2	MH-B10	12 inch	2,735.00	0.013	0.002212	0.00	1.08	0.00	1.08
P-B11	MH-B3	MH-B11	12 inch	2,698.00	0.013	0.002202	0.00	1.08	0.00	1.08
P-B14	O-B6	MH-B14	10 inch	2,636.00	0.013	0.002807	1.72	0.75	0.10	0.65
P-B15	MH-B7	MH-B15	10 inch	2,638.00	0.013	0.002801	1.46	0.75	0.06	0.69
P-B16	MH-B8	MH-B16	10 inch	2,642.00	0.013	0.002801	1.36	0.75	0.04	0.71
P-B20	MH-4	MH-B20	21 inch	2,510.00	0.013	0.001000	0.47	3.24	0.73	2.51
P-B21	MH-B20	MH-B21	21 inch	2,802.00	0.013	0.001003	0.31	3.24	0.48	2.76
P-B22	MH-B21	MH-B22	18 inch	2,642.00	0.013	0.001211	0.77	2.36	0.24	2.12
P-B23	MH-B22	MH-B23	15 inch	2,648.00	0.013	0.001586	0.00	1.66	0.00	1.66
P-B24	MH-B20	MH-B24	12 inch	2,642.00	0.013	0.002195	1.10	1.08	0.24	0.84
P-B25	MH-B21	MH-B25	12 inch	2,639.00	0.013	0.002198	1.10	1.08	0.24	0.84
P-B26	MH-B22	MH-B26	12 inch	2,642.00	0.013	0.002199	2.06	1.08	0.24	0.84
P-B27	MH-B33	MH-B27	12 inch	2,508.00	0.013	0.002201	0.76	1.08	0.09	0.99
P-B30	MH-6	MH-B30	24 inch	2,553.00	0.013	0.000823	1.55	4.19	3.16	1.04
P-B31	MH-B30	MH-B31	18 inch	2,779.00	0.013	0.001151	2.38	2.30	2.72	-0.42
P-B32	MH-B31	MH-B32	15 inch	2,640.00	0.013	0.001591	3.12	1.67	2.48	-0.81
P-B33	O-B32	MH-B33	15 inch	2,670.00	0.013	0.001599	3.15	1.67	1.52	0.15
P-B34	MH-B33	MH-B34	15 inch	2,648.00	0.013	0.001601	1.27	1.67	0.49	1.18
P-B35	MH-B30	MH-B35	12 inch	2,750.00	0.013	0.002200	0.48	1.08	0.24	0.84
P-B36	MH-B31	MH-B36	12 inch	2,772.00	0.013	0.002201	0.48	1.08	0.24	0.84
P-B37	O-B32	MH-B37	12 inch	2,777.00	0.013	0.002200	2.80	1.08	0.73	0.35
P-B38	MH-B33	MH-B38	12 inch	2,780.00	0.013	0.002201	2.12	1.08	0.73	0.35
P-B39	MH-B34	MH-B39	12 inch	2,772.00	0.013	0.002201	2.26	1.08	0.34	0.74
P-B50	MH-8	MH-B50	24 inch	2,385.00	0.013	0.000881	2.94	4.34	5.97	-1.63
P-B51	MH-B50	MH-B51	21 inch	2,964.00	0.013	0.000877	3.14	3.03	4.88	-1.84
P-B52	MH-B51	MH-B52	18 inch	2,591.00	0.013	0.001235	2.95	2.39	3.37	-0.98
P-B53	O-B52	MH-B53	15 inch	2,543.00	0.013	0.001600	3.33	1.67	1.91	-0.24
P-B54	MH-B53	MH-B54	15 inch	2,655.00	0.013	0.001601	1.92	1.67	1.22	0.45
P-B55	MH-B54	MH-B55	15 inch	2,652.00	0.013	0.001614	1.30	1.68	0.48	1.20
P-B56	MH-B55	MH-B56	15 inch	2,617.00	0.013	0.001605	1.42	1.67	0.32	1.35
P-B57	MH-B56	MH-B57	15 inch	2,621.00	0.013	0.001602	1.40	1.67	0.32	1.35
P-B58	MH-B57	MH-B58	12 inch	2,645.00	0.013	0.002212	1.99	1.08	0.21	0.87
P-B59	MH-B57	MH-B59	12 inch	2,655.00	0.013	0.002203	1.32	1.08	0.11	0.97
P-B60	MH-B50	MH-B60	12 inch	2,524.00	0.013	0.002298	0.72	1.10	0.36	0.74
P-B61	MH-B51	MH-B61	12 inch	2,539.00	0.013	0.002202	1.53	1.08	0.78	0.30
P-B62	O-B52	MH-B62	12 inch	2,497.00	0.013	0.002199	2.80	1.08	0.73	0.35
P-B63	MH-B53	MH-B63	12 inch	2,596.00	0.013	0.002188	1.81	1.08	0.69	0.38

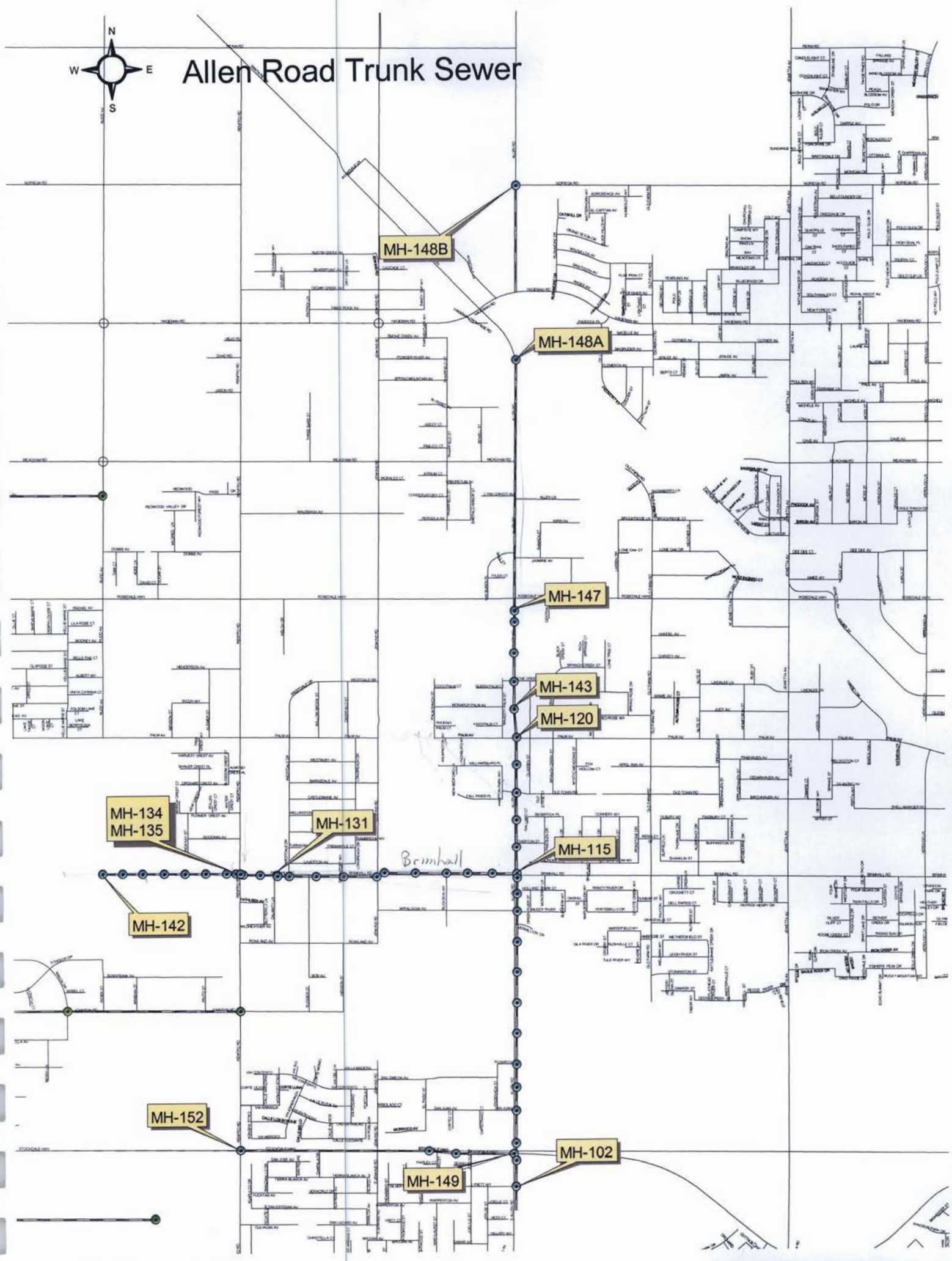
Scenario: NORSD No. 1 AREA B - FUTURE LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-B64	MH-B54	MH-B64	12 inch	2,598.00	0.013	0.002194	0.00	1.08	0.00	1.08
P-B70	O-1	MH-B70	12 inch	2,639.00	0.013	0.002236	2.88	1.09	1.46	-0.38
P-B71	MH-3	MH-B71	12 inch	2,610.00	0.013	0.002222	1.38	1.09	0.40	0.69
P-B76	MH-8	MH-B76	12 inch	2,319.00	0.013	0.002199	0.18	1.08	0.09	0.99

City Planned Sewer Area No. 1
(Allen Road Trunk Sewer)

Allen Road Trunk Sewer



Additional Projected Equivalent Single Family Dwellings - CITY Planned Sewer Area No. 1
Allen Road Trunk Sewer
Project No: 02621
Date: March 20, 2004

SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
134	29/26	35C	RR	64	0.40	26	
					Total	26	
142	29/26	27A	SR	-	3.00	108	dry
	29/26	27C	SR	155	3.00	465	
	29/26	34A	SR	74	3.00	222	
	29/26	34A	GC	5	12.82	64	
					Total	859	
148A	29/26	14D	R-IA	10	0.00	0	
	29/26	14D	SR	14	3.00	42	
					Total	42	
148B	29/26	14B	R-IA	160	0.00	0	
	29/26	13A	HMR	20	15.68	314	CITY
	29/26	13A	LR	133	6.00	798	CITY
	29/26	14D	HI	78	17.32	1351	
	29/26	13C	RR	40	0.40	16	
	29/26	13C	LI	12	17.32	208	
	29/26	24A	SR	29	3.00	87	
					Total	2774	
EXISTING ESFDS:	29/26	22B	UER	77	1.33	102	
	29/26	22B	RR	75	0.40	30	
	29/26	23A	SR	85	3.00	255	
	29/26	23A	RR	78	0.40	31	
	29/26	23B	UER		1.33	74	septic
	29/26	23B	UER	9.2	1.33	12	
	29/26	23B	LI	27	17.32	468	
	29/26	23B	SR	18	3.00	54	
	29/26	23B	SR		3.00	18	septic
	29/26	23B	UER		1.33	49	septic
	29/26	23B	UER	9	1.33	12	
	29/26	24A	LI	13	17.32	225	
	29/26	24A	UER	5	1.33	7	
	29/26	24D	UER		1.33	88	septic
	29/26	24D	HMR	5	15.68	78	
	29/26	24C	UER		1.33	54	septic
	29/26	24C	UER	15	1.33	20	
	29/26	24C	GC	15	12.82	192	
	29/26	24C	SR	24	3.00	72	
	29/26	24C	UER		1.33	45	septic
	29/26	23D	ER	18	0.95	17	
	29/26	23D	LMR		9.00	33	septic

SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
EXISTING ESFDS:	29/26	23D	GC	1.5	12.82	19	
	29/26	23D	UER		1.33	74	septic
	29/26	23D	UER	39	1.33	52	
	29/26	23D	ER	5	0.95	5	
	29/26	23D	ER		0.95	12	septic
	29/26	23D	ER	19	0.95	18	
	29/26	23C	RR	72	0.40	29	
	29/26	23C	LI	68	17.32	1178	
	29/26	23C	GC	1	12.82	13	
	29/26	23C	ER		0.95	8	septic
	29/26	22D	UER	23	1.33	31	
	29/26	22D	UER		1.33	91	septic
	29/26	22D	P	10	3.50	35	
	29/26	22D	UER		1.33	83	septic
	29/26	22D	OS-P	7	0.08	1	
	29/26	22D	GC	17	12.82	218	
	29/26	27B	SR	75	3.00	225	
	29/26	27B	UER	37.6	1.33	50	
	29/26	27B	SR		3.00	49	septic
	29/26	26A	RR	33	0.40	13	
	29/26	26A	RR	12	0.40	5	
	29/26	26A	UER		1.33	96	septic
	29/26	26A	HMR	41	15.68	643	
	29/26	26A	GC	14	12.82	179	
	29/26	26B	SR	60	3.00	180	CITY
	29/26	26B	GC	19	12.82	244	CITY
	29/26	26B	SR		3.00	89	wet
	29/26	26B	GC	11	12.82	141	wet
	29/26	26B	UER		1.33	29	septic
	29/26	25A	UER		1.33	174	wet
	29/26	25A	PS	41	3.50	144	
	29/26	25A	SR	16	3.00	48	
	29/26	25B	GC	6	12.82	77	
	29/26	25B	ER	53	0.95	50	
	29/26	25B	UER		1.33	162	septic
	29/26	25D	UER		1.33	33	septic
	29/26	25C	UER		1.33	112	septic
	29/26	26C	RR	26	0.40	10	
	29/26	26C	UER		1.33	48	septic
	29/26	26C	SR		3.00	171	wet
	29/26	26C	SR		3.00	49	septic
	29/26	26C	PS	9	3.50	32	
	29/26	26C	OSP	8	0.08	1	
	29/26	26D	LMR	8	9.00	72	CITY
	29/26	26D	SR	125	3.00	375	CITY
	29/26	26D	SR		3.00	53	CITY
	29/26	26D	GC	9	12.82	115	CITY
	29/26	27D	SR		3.00	134	septic

SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
EXISTING ESFDS:	29/26	27D	UER		1.33	30	septic
	29/26	27D	SR	11	3.00	33	
	29/26	27D	UER	80	1.33	106	
	29/26	34B	UER	40	1.33	53	
	29/26	34B	SR	40	3.00	120	
	29/26	35A	ER	4	0.95	4	
	29/26	35A	SR		3.00	37	septic
	29/26	35A	RR	59	0.40	24	
	29/26	35B	UER		1.33	60	septic
	29/26	35A	SR	20	3.00	60	CITY
	29/26	35A	SR		3.00	45	CITY
					Total	8177	
					Sub-Total	**11,878**	
					County	**141**	connected
					City	**2,256**	
					Grand Total	**9,481**	

Scenario: ALLEN ROAD - EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-101	O-101	MH-102	42 inch	467.46	0.011	0.000364	1.85	14.65	2.70	11.96
P-102	MH-102	MH-103	42 inch	499.35	0.011	0.000360	1.40	14.59	2.23	12.36
P-103	MH-103	MH-104	36 inch	329.81	0.011	0.000455	1.48	10.86	1.22	9.65
P-104	MH-104	MH-105	36 inch	617.70	0.011	0.000453	1.37	10.85	1.22	9.63
P-105	MH-105	MH-106	36 inch	435.77	0.011	0.000436	1.32	10.64	1.22	9.42
P-106	MH-106	MH-107	36 inch	435.77	0.011	0.000459	1.29	10.91	1.22	9.69
P-107	MH-107	MH-108	36 inch	589.00	0.011	0.000458	1.31	10.91	1.22	9.69
P-108	MH-108	MH-109	36 inch	589.00	0.011	0.000441	1.32	10.70	1.22	9.48
P-109	MH-109	MH-110	36 inch	589.00	0.011	0.000458	1.33	10.91	1.22	9.69
P-110	MH-110	MH-111	36 inch	589.00	0.011	0.000441	1.16	10.70	1.02	9.69
P-111	MH-111	MH-112	36 inch	592.69	0.011	0.000456	1.22	10.87	1.02	9.86
P-112	MH-112	MH-113	36 inch	340.00	0.011	0.000441	1.20	10.70	1.02	9.68
P-113	MH-113	MH-114	36 inch	303.65	0.011	0.000165	0.88	6.54	0.84	5.70
P-114	MH-114	MH-115	21 inch	81.00	0.011	0.003210	2.84	6.86	0.68	6.18
P-115	MH-115	MH-116	18 inch	519.00	0.011	0.010019	2.20	8.03	0.51	7.52
P-116	MH-116	MH-117	18 inch	525.29	0.011	0.000990	1.81	2.52	0.51	2.01
P-117	MH-117	MH-118	18 inch	525.28	0.011	0.001009	1.53	2.55	0.51	2.04
P-118	MH-118	MH-119	18 inch	530.17	0.011	0.001000	1.37	2.54	0.42	2.11
P-119	MH-119	MH-120	18 inch	530.17	0.011	0.001000	1.43	2.54	0.42	2.11
P-120	MH-115	MH-121	18 inch	474.94	0.011	0.001137	1.03	2.71	0.20	2.50
P-121	MH-121	MH-122	18 inch	475.00	0.011	0.001137	1.15	2.71	0.20	2.50
P-122	MH-122	MH-123	18 inch	410.31	0.011	0.001145	1.15	2.72	0.20	2.51
P-123	MH-123	MH-124	18 inch	599.48	0.011	0.001118	1.14	2.68	0.20	2.48
P-124	MH-124	MH-125	18 inch	598.00	0.011	0.001137	1.14	2.71	0.20	2.50
P-125	MH-125	MH-126	18 inch	164.90	0.011	0.001213	1.14	2.79	0.20	2.59
P-126	MH-126	MH-127	18 inch	639.00	0.011	0.001127	1.14	2.69	0.20	2.49
P-127	MH-127	MH-128	18 inch	524.54	0.011	0.001125	1.03	2.69	0.17	2.52
P-128	MH-128	MH-129	18 inch	519.11	0.011	0.001137	1.07	2.70	0.17	2.54
P-129	MH-129	MH-130	18 inch	229.19	0.011	0.005803	0.00	6.11	0.00	6.11
P-130	MH-130	MH-131	18 inch	23.00	0.011	0.004783	0.00	5.55	0.00	5.55
P-131	MH-131	MH-132	18 inch	328.00	0.011	0.002134	0.00	3.71	0.00	3.71
P-132	MH-132	MH-133	18 inch	325.00	0.011	0.002154	0.00	3.72	0.00	3.72
P-133	MH-135	MH-134	18 inch	85.00	0.011	0.001059	0.00	2.61	0.00	2.61
P-134	MH-135	MH-136	15 inch	179.00	0.011	0.001006	0.00	1.56	0.00	1.56
P-135	MH-136	MH-137	15 inch	400.00	0.011	0.001000	0.00	1.56	0.00	1.56
P-136	MH-137	MH-138	15 inch	400.00	0.011	0.001000	0.00	1.56	0.00	1.56
P-137	MH-138	MH-139	15 inch	400.00	0.011	0.001000	0.00	1.56	0.00	1.56
P-138	MH-139	MH-140	15 inch	400.00	0.011	0.001000	0.00	1.56	0.00	1.56
P-139	MH-140	MH-141	15 inch	400.00	0.011	0.001000	0.00	1.56	0.00	1.56
P-140	MH-141	MH-142	15 inch	385.00	0.011	0.001039	0.00	1.59	0.00	1.59
P-141	O-102	MH-135	18 inch	76.00	0.010	0.003289	0.00	5.06	0.00	5.06
P-142	MH-120	MH-143	15 inch	528.00	0.011	0.001004	0.00	1.56	0.00	1.56
P-143	MH-143	MH-144	15 inch	535.00	0.011	0.001009	0.00	1.57	0.00	1.57
P-144	MH-144	MH-145	15 inch	540.00	0.011	0.001000	0.00	1.56	0.00	1.56
P-145	MH-145	MH-146	15 inch	600.00	0.011	0.001000	0.00	1.56	0.00	1.56
P-146	MH-146	MH-147	15 inch	212.00	0.011	0.000991	0.00	1.55	0.00	1.55
P-147	MH-147	MH-148A	15 inch	4,792.00	0.013	0.001500	0.00	1.62	0.00	1.62
P-148	O-148A	MH-148B	15 inch	2,022.00	0.013	0.001508	0.00	1.62	0.00	1.62
P-149	MH-103	MH-149	24 inch	131.00	0.013	0.000763	0.00	4.04	0.00	4.04
P-150	MH-149	MH-150	24 inch	1,116.00	0.013	0.000806	0.00	4.15	0.00	4.15
P-151	MH-150	MH-151	24 inch	522.00	0.013	0.000805	0.00	4.15	0.00	4.15

Scenario: ALLEN ROAD - EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-152	MH-151	MH-152	24 inch	3,628.00	0.013	0.000799	0.00	4.13	0.00	4.13

Scenario: ALLEN ROAD - FUTURE LOADS

CAPACITY REPORT

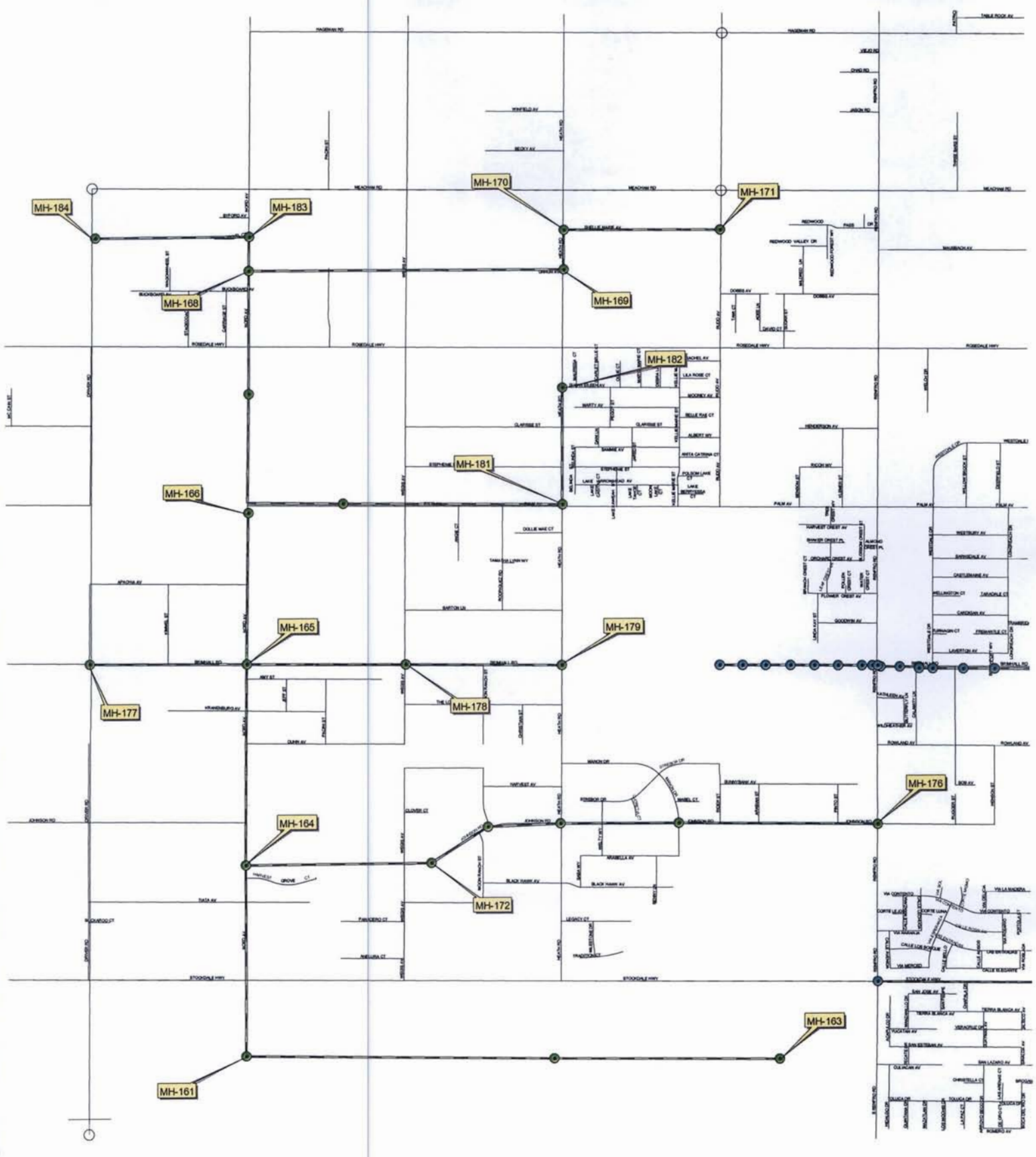
Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-101	O-101	MH-102	42 inch	467.46	0.011	0.000364	3.26	14.65	10.90	3.76
P-102	MH-102	MH-103	42 inch	499.35	0.011	0.000360	2.84	14.59	10.90	3.69
P-103	MH-103	MH-104	36 inch	329.81	0.011	0.000455	2.65	10.86	7.65	3.21
P-104	MH-104	MH-105	36 inch	617.70	0.011	0.000453	2.50	10.85	7.65	3.20
P-105	MH-105	MH-106	36 inch	435.77	0.011	0.000436	2.39	10.64	7.65	2.99
P-106	MH-106	MH-107	36 inch	435.77	0.011	0.000459	2.31	10.91	7.65	3.26
P-107	MH-107	MH-108	36 inch	589.00	0.011	0.000458	2.04	10.91	6.79	4.12
P-108	MH-108	MH-109	36 inch	589.00	0.011	0.000441	2.05	10.70	6.79	3.91
P-109	MH-109	MH-110	36 inch	589.00	0.011	0.000458	2.07	10.91	6.79	4.12
P-110	MH-110	MH-111	36 inch	589.00	0.011	0.000441	2.07	10.70	6.79	3.91
P-111	MH-111	MH-112	36 inch	592.69	0.011	0.000456	2.08	10.87	6.79	4.08
P-112	MH-112	MH-113	36 inch	340.00	0.011	0.000441	2.06	10.70	6.79	3.91
P-113	MH-113	MH-114	36 inch	303.65	0.011	0.000165	1.97	6.54	6.79	-0.25
P-114	MH-114	MH-115	21 inch	81.00	0.011	0.003210	5.27	6.86	6.79	0.07
P-115	MH-115	MH-116	18 inch	519.00	0.011	0.010019	3.89	8.03	3.35	4.68
P-116	MH-116	MH-117	18 inch	525.29	0.011	0.000990	3.59	2.52	3.35	-0.83
P-117	MH-117	MH-118	18 inch	525.28	0.011	0.001009	2.93	2.55	3.35	-0.80
P-118	MH-118	MH-119	18 inch	530.17	0.011	0.001000	2.93	2.54	3.35	-0.81
P-119	MH-119	MH-120	18 inch	530.17	0.011	0.001000	2.93	2.54	3.35	-0.81
P-120	MH-115	MH-121	18 inch	474.94	0.011	0.001137	3.02	2.71	3.44	-0.74
P-121	MH-121	MH-122	18 inch	475.00	0.011	0.001137	3.01	2.71	3.44	-0.74
P-122	MH-122	MH-123	18 inch	410.31	0.011	0.001145	3.01	2.72	3.44	-0.73
P-123	MH-123	MH-124	18 inch	599.48	0.011	0.001118	3.01	2.68	3.44	-0.76
P-124	MH-124	MH-125	18 inch	598.00	0.011	0.001137	3.01	2.71	3.44	-0.74
P-125	MH-125	MH-126	18 inch	164.90	0.011	0.001213	3.01	2.79	3.44	-0.65
P-126	MH-126	MH-127	18 inch	639.00	0.011	0.001127	3.01	2.69	3.44	-0.75
P-127	MH-127	MH-128	18 inch	524.54	0.011	0.001125	3.01	2.69	3.44	-0.75
P-128	MH-128	MH-129	18 inch	519.11	0.011	0.001137	3.01	2.70	3.44	-0.74
P-129	MH-129	MH-130	18 inch	229.19	0.011	0.005803	2.70	6.11	3.08	3.03
P-130	MH-130	MH-131	18 inch	23.00	0.011	0.004783	2.70	5.55	3.08	2.47
P-131	MH-131	MH-132	18 inch	328.00	0.011	0.002134	2.70	3.71	3.08	0.63
P-132	MH-132	MH-133	18 inch	325.00	0.011	0.002154	2.70	3.72	3.08	0.64
P-133A	MH-135	MH-134A	18 inch	85.00	0.011	0.001059	2.00	2.61	2.10	0.51
P-134	MH-135	MH-136	15 inch	179.00	0.011	0.001006	1.34	1.56	0.99	0.57
P-135	MH-136	MH-137	15 inch	400.00	0.011	0.001000	1.46	1.56	0.99	0.57
P-136	MH-137	MH-138	15 inch	400.00	0.011	0.001000	1.64	1.56	0.99	0.57
P-137	MH-138	MH-139	15 inch	400.00	0.011	0.001000	1.78	1.56	0.99	0.57
P-138	MH-139	MH-140	15 inch	400.00	0.011	0.001000	1.85	1.56	0.99	0.57
P-139	MH-140	MH-141	15 inch	400.00	0.011	0.001000	1.87	1.56	0.99	0.57
P-140	MH-141	MH-142	15 inch	385.00	0.011	0.001039	1.89	1.59	0.99	0.60
P-141	O-133	MH-135	18 inch	76.00	0.010	0.003289	2.80	5.06	3.08	1.98
P-142	MH-120	MH-143	15 inch	528.00	0.011	0.001004	3.61	1.56	2.86	-1.30
P-143	MH-143	MH-144	15 inch	535.00	0.011	0.001009	3.61	1.57	2.86	-1.29
P-144	MH-144	MH-145	15 inch	540.00	0.011	0.001000	3.61	1.56	2.86	-1.30
P-145	MH-145	MH-146	15 inch	600.00	0.011	0.001000	3.61	1.56	2.86	-1.30
P-146	MH-146	MH-147	15 inch	212.00	0.011	0.000991	3.61	1.55	2.86	-1.31
P-147	MH-147	MH-148A	15 inch	4,792.00	0.013	0.001500	2.14	1.62	1.69	-0.08
P-148	O-148A	MH-148B	15 inch	2,022.00	0.013	0.001508	2.08	1.62	1.65	-0.03
P-149	MH-103	MH-149	24 inch	131.00	0.013	0.000763	2.94	4.04	3.26	0.78
P-150	MH-149	MH-150	24 inch	1,116.00	0.013	0.000806	2.36	4.15	3.26	0.90
P-151	MH-150	MH-151	24 inch	522.00	0.013	0.000805	2.15	4.15	3.26	0.89

Scenario: ALLEN ROAD - FUTURE LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-152	MH-151	MH-152	24 inch	3,628.00	0.013	0.000799	2.14	4.13	3.26	0.88

City Planned Sewer Area No. 2 / Stockdale-Nord
(Allen Road Trunk Sewer)



Stockdale - Nord Trunk Sewer

Projected Equivalent Single Family Dwellings - City Planned Sewer Area No. 2
Stockdale - Nord Trunk Sewer
Project No: 02621
Date: March 20, 2004

SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
161	30/26	5B	R-IA	160	0.00	0	
	30/26	4A	ER	160	0.95	152	
					Total	152	
162	30/26	4B	ER	160	0.95	152	
	30/26	3A	ER	48	0.95	46	
					Total	198	
163	30/26	3A	UER	112	1.33	149	
	30/26	3B	GC	18	12.82	231	
	30/26	3B	SR	62	3.00	186	
	30/26	3B	LR	77	6.00	462	CITY
					Total	1028	
164	29/26	32D	RR	160	0.40	64	
	29/26	32B	RR	57	0.40	23	
	29/26	32B	R-IA	59	0.00	0	
	29/26	33A	R-MP	100	0.00	0	
	29/26	33C	ER	78	0.95	74	
	29/26	33C	RR	54	0.40	22	
					Total	183	
165	29/26	29D	R-IA	160	0.00	0	
					Total	0	
166	29/26	29B	R-IA	157	0.00	0	
	29/26	29B	GC	3	12.82	38	
					Total	38	
168	29/26	21C	ER	43	0.95	41	
	29/26	21C	UER	98	1.33	130	
	29/26	21C	GC	14	12.82	179	
					Total	351	
169	29/26	22C	UER	78	1.33	104	
	29/26	21D	UER	160	1.33	213	
					Total	317	

SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
171	29/26	22C	UER	38	1.33	51	
	29/26	22C	RR	36	0.40	14	
					Total	65	
173	29/26	33B&D	RR	210	0.40	84	
					Total	84	
174	29/26	34A	ER	67	0.95	64	
	29/26	34C	ER	37	0.95	35	
	29/26	34C	UER	104	1.33	138	
					Total	237	
175	29/26	34D	LR	53	6.00	318	CITY
	29/26	34D	R-IA	13	0.00	0	CITY
	29/27	34D	LMR	15	9.00	135	CITY
	29/28	34D	GC	15	12.82	192	CITY
	29/26	34D	SR	57	3.00	171	
					Total	816	
176	29/26	34B	ER	72	0.95	68	
					Total	68	
177	29/26	32B	RR	24	0.40	10	
	29/26	32B	UER	15	1.33	20	
					Total	30	
178	29/26	28C	ER	160	0.95	152	
	29/26	33A	ER	69	0.95	66	
					Total	218	
179	29/26	28D	ER	59	0.95	56	
	29/26	28D	RR	87	0.40	35	
	29/26	33B	ER	70	0.95	67	
					Total	157	
180	29/26	28A	ER	160	0.95	152	
					Total	152	
181	29/26	28B	RR	70	0.40	28	
					Total	28	
182	29/26	28B	ER	77	0.95	73	
	29/26	27A	SR	100	-	331	DRY
					Total	404	
183	29/26	20D	UER	75	1.33	100	
					Total	100	

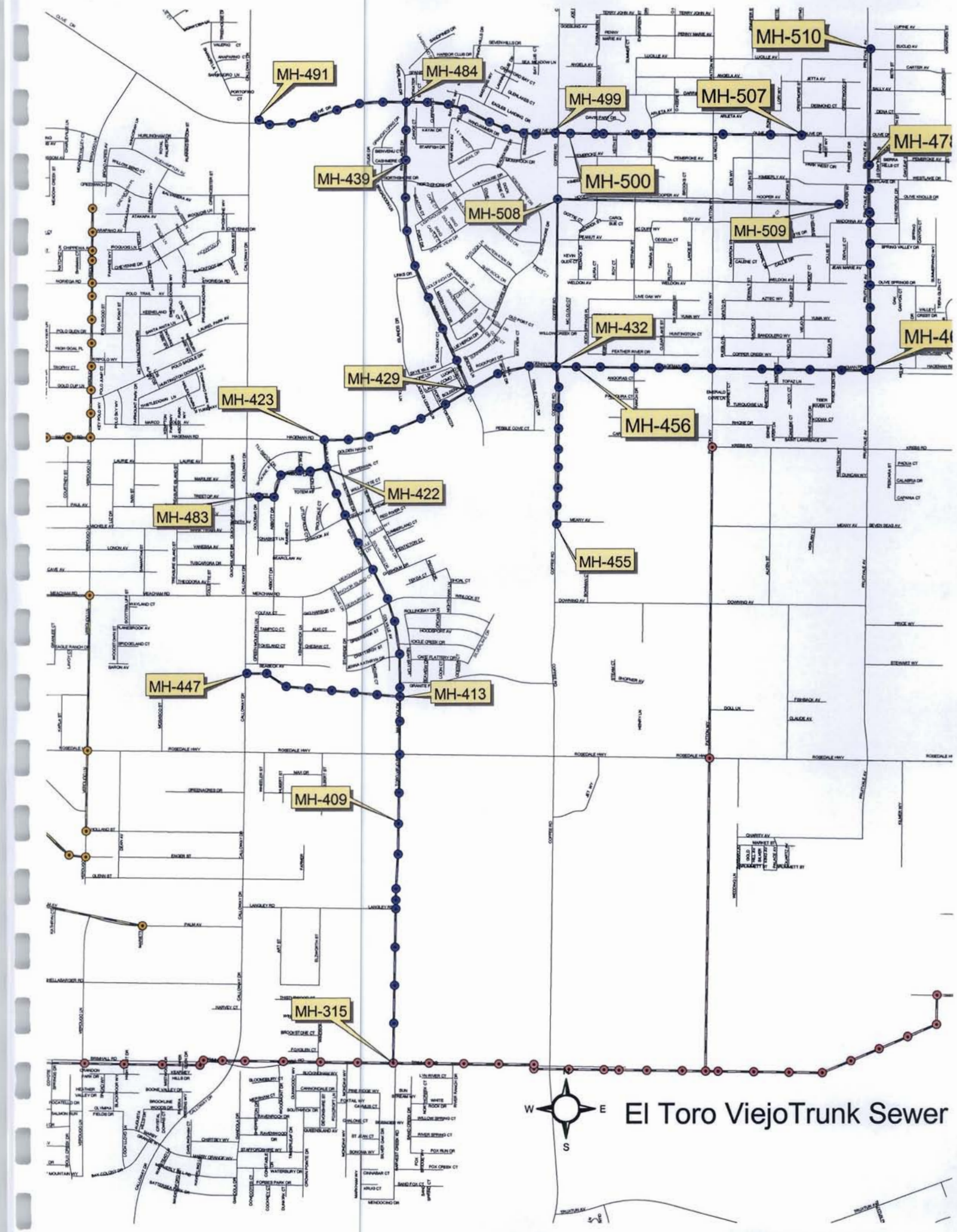
SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots
184	29/26	20D	SR	12	3.00	36
	29/26	20D	GC	3	12.82	38
	29/26	20D	SR	55	3.00	165
	29/26	20D	UER	13	1.33	17
					Total	257
					Sub-Total	**4,881**
					City	***1,107***
					Grand Total	***3,774***

Scenario: STOCKDALE-NORD FUTURE LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-161	O-160	MH-161	12 inch	1,289.00	0.013	0.0020	2.96	0.86	0.95	-0.09
P-162	MH-161	MH-162	10 inch	5,179.00	0.013	0.0025	2.70	0.59	0.85	-0.26
P-163	MH-162	MH-163	10 inch	3,775.00	0.013	0.0025	2.03	0.59	0.72	-0.12
P-164	O-160	MH-164	18 inch	1,918.00	0.013	0.0011	3.27	1.90	2.40	-0.51
P-165	MH-164	MH-165	18 inch	3,356.00	0.013	0.0011	1.72	2.25	1.50	0.75
P-166	MH-165	MH-166	18 inch	2,640.00	0.013	0.0011	1.72	2.25	1.17	1.08
P-167	O-166	MH-167	12 inch	1,823.00	0.013	0.0015	2.67	0.89	0.76	0.13
P-168	MH-167	MH-168	12 inch	2,059.00	0.013	0.0020	1.97	1.03	0.76	0.27
P-169	MH-168	MH-169	12 inch	5,301.00	0.013	0.0020	1.36	1.03	0.32	0.71
P-170	MH-169	MH-170	10 inch	666.00	0.013	0.0025	0.83	0.71	0.06	0.64
P-171	MH-170	MH-171	10 inch	2,623.00	0.013	0.0025	1.25	0.71	0.06	0.64
P-172	MH-164	MH-172	12 inch	3,117.00	0.013	0.0020	1.99	1.03	0.85	0.18
P-173	MH-172	MH-173	12 inch	1,128.00	0.013	0.0020	2.27	1.03	0.85	0.18
P-174	MH-173	MH-174	12 inch	1,224.00	0.013	0.0036	2.46	1.38	0.79	0.59
P-175	MH-174	MH-175	10 inch	1,985.00	0.013	0.0019	2.42	0.52	0.63	-0.10
P-176	MH-175	MH-176	10 inch	3,327.00	0.013	0.0025	0.73	0.59	0.07	0.53
P-177	MH-165	MH-177	10 inch	2,645.00	0.013	0.0025	1.23	0.71	0.03	0.68
P-178	MH-165	MH-178	10 inch	2,669.00	0.013	0.0025	2.32	0.71	0.31	0.40
P-179	MH-178	MH-179	10 inch	2,636.00	0.013	0.0025	1.12	0.71	0.14	0.57
P-180	O-166	MH-180	12 inch	1,600.00	0.013	0.0020	2.44	1.03	0.47	0.56
P-181	MH-180	MH-181	12 inch	3,697.00	0.013	0.0020	1.51	1.03	0.36	0.67
P-182	MH-181	MH-182	10 inch	1,942.00	0.013	0.0026	2.37	0.60	0.33	0.27
P-183	MH-168	MH-183	10 inch	578.00	0.013	0.0025	1.65	0.71	0.29	0.42
P-184	MH-183	MH-184	10 inch	2,593.00	0.013	0.0025	1.57	0.71	0.21	0.50

City Planned Sewer Area No. 3 and Miscellaneous
(El Toro Viejo Trunk Sewer)


MH-491
MH-484
MH-510
MH-499
MH-507
MH-439
MH-500
MH-508
MH-509
MH-432
MH-429
MH-423
MH-456
MH-422
MH-483
MH-455
MH-447
MH-413
MH-409
MH-315
W
E
S
El Toro ViejoTrunk Sewer

Projected Equivalent Single Family Dwellings - City Planned Sewer Area No. 3 and Miscellaneous
El Toro Viejo Trunk Sewer
Project No: 02621
Date: March 20, 2004

SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
423	29/27	17A&C	LMR	39	9.00	351	CITY
					Total	351	
429	29/27	17D	PS	46.6	3.50	163	CITY
	29/27	20B	OS-P	25.7	0.08	2	CITY
	29/27	20B	HMR	6.46	15.68	101	CITY
	29/27	20B	OC	7.05	12.82	90	CITY
	29/27	20B	GC	15	12.82	192	CITY
					Total	549	
447	29/27	19D	GC	26	12.82	333	CITY
					Total	333	
455	29/27	21A	GC	23	12.82	295	CITY
	29/27	21A	LR	44	6.00	264	CITY
					Total	559	
466	29/27	16D	HMR	23	15.68	361	CITY
	29/27	15C	SR	75	3.00	225	
	29/27	15C	GC	2	12.82	26	
					Total	611	
471	29/27	15A	SR	12	3.00	36	CITY
					Total	36	
477	29/27	15A	SR	4	3.00	12	CITY
	29/27	15A	SR	0	3.00	59	septic
					Total	71	
483	29/27	18D	LR	23	6.00	138	CITY
					Total	138	
491	29/27	8C	ER	18	0.95	17	
	29/27	7B	LR	94	6.00	564	CITY
					Total	581	
507	29/27	9C	PS	10	3.50	35	
	29/27	9C	SR	0	3.00	270	septic
	29/27	9C	SR	6	3.00	18	
	29/27	9D	SR	0	3.00	328	septic
	29/27	9D	SR	13	3.00	39	
					Total	690	

SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
508	29/27	16A	SR	0	3.00	405	septic
					Total	405	
509	29/27	16B	SR	0	3.00	160	septic
					Total	160	
510	29/27	9D	GC	2	12.82	26	
	29/27	10D	OS-P	9	0.08	1	
	29/27	10D	PS	9	3.50	32	
	29/27	10D	SR	0	3.00	316	
	29/27	10D	SR	3	3.00	9	
					Total	383	
					Sub-Total	**4,868**	
					County	**1**	connected
					City	**2,903**	
					Grand Total	**1,964**	

Scenario: EL TORO VIEJO - EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-401	O-315	MH-402	36 inch	726.12	0.011	0.000744	2.52	13.89	5.64	8.25
P-402	MH-402	MH-403	36 inch	648.40	0.011	0.000540	2.51	11.84	5.64	6.19
P-403	MH-403	MH-404	36 inch	651.70	0.011	0.000660	2.46	13.09	5.64	7.44
P-404	MH-404	MH-405	36 inch	659.60	0.011	0.000531	2.43	11.73	5.64	6.09
P-405	MH-405	MH-406	36 inch	151.80	0.011	0.001779	2.53	21.48	5.64	15.84
P-406	MH-406	MH-407	36 inch	194.70	0.011	0.000565	2.69	12.11	5.64	6.46
P-407	MH-407	MH-408	36 inch	598.60	0.011	0.000601	2.51	12.49	5.64	6.85
P-408	MH-408	MH-409	36 inch	532.20	0.011	0.000225	2.28	7.65	5.64	2.01
P-409	MH-409	MH-410	36 inch	605.80	0.011	0.000924	2.35	15.49	5.64	9.84
P-410	MH-410	MH-411	36 inch	658.10	0.011	0.000395	2.40	10.13	5.64	4.48
P-411	MH-411	MH-412	30 inch	560.10	0.011	0.001089	3.04	10.34	5.02	5.32
P-412	MH-412	MH-413	30 inch	418.20	0.011	0.000813	2.90	8.93	5.02	3.91
P-413	MH-413	MH-414	30 inch	153.10	0.011	0.000784	2.41	8.77	4.47	4.31
P-414	MH-414	MH-415	30 inch	566.70	0.011	0.000635	2.25	7.90	4.26	3.64
P-415	MH-415	MH-416	30 inch	558.90	0.011	0.000608	2.16	7.73	4.06	3.67
P-416	MH-416	MH-417	30 inch	400.40	0.011	0.000874	2.26	9.26	4.06	5.21
P-417	MH-417	MH-418	30 inch	555.70	0.011	0.000648	2.28	7.97	3.97	4.00
P-418	MH-418	MH-419	30 inch	521.80	0.011	0.000690	2.23	8.23	3.86	4.37
P-419	MH-419	MH-420	30 inch	522.90	0.011	0.000421	2.08	6.43	3.73	2.70
P-420	MH-420	MH-421	30 inch	389.10	0.011	0.001079	2.09	10.29	3.51	6.78
P-421	MH-421	MH-422	30 inch	390.00	0.011	0.000692	2.23	8.24	3.51	4.73
P-422	MH-422	MH-423	30 inch	473.00	0.011	0.000761	2.10	8.64	3.22	5.42
P-423	MH-423	MH-424	30 inch	416.00	0.011	0.000649	2.07	7.98	3.10	4.88
P-424	MH-424	MH-425	30 inch	360.00	0.011	0.000694	2.06	8.26	3.10	5.15
P-425	MH-425	MH-426	30 inch	450.00	0.011	0.000689	2.08	8.22	3.10	5.12
P-426	MH-426	MH-427	30 inch	450.00	0.011	0.000756	2.14	8.61	3.10	5.51
P-427	MH-427	MH-428	30 inch	519.10	0.011	0.000944	2.31	9.63	3.10	6.52
P-428	MH-428	MH-429	30 inch	484.20	0.011	0.001363	2.67	11.57	3.08	8.49
P-429	MH-429	MH-430	21 inch	553.50	0.011	0.001481	2.50	4.66	1.47	3.19
P-430	MH-430	MH-431	21 inch	550.70	0.011	0.001925	2.54	5.31	1.45	3.86
P-431	MH-431	MH-432	21 inch	481.90	0.011	0.001162	2.38	4.13	1.43	2.70
P-432	MH-429	MH-433	18 inch	588.00	0.011	0.001650	3.32	3.26	1.74	1.52
P-433	MH-433	MH-434	18 inch	590.10	0.011	0.001915	2.59	3.51	1.53	1.98
P-434	MH-434	MH-435	18 inch	587.30	0.011	0.001652	2.66	3.26	1.53	1.73
P-435	MH-435	MH-436	18 inch	585.00	0.011	0.001538	2.56	3.15	1.53	1.61
P-436	MH-436	MH-437	18 inch	603.70	0.011	0.001872	2.64	3.47	1.53	1.94
P-437	MH-437	MH-438	18 inch	564.00	0.011	0.001773	2.68	3.38	1.53	1.85
P-438	MH-438	MH-439	18 inch	588.90	0.011	0.001562	2.37	3.17	1.32	1.86
P-439	MH-439	MH-440	18 inch	579.30	0.011	0.001726	2.39	3.33	1.24	2.10
P-440	MH-413	MH-441	12 inch	390.00	0.011	0.001692	2.15	1.12	0.27	0.85
P-441	MH-441	MH-442	12 inch	390.00	0.011	0.001718	1.55	1.13	0.27	0.86
P-442	MH-442	MH-443	12 inch	390.00	0.011	0.001692	1.55	1.12	0.27	0.85
P-443	MH-443	MH-444	12 inch	390.00	0.011	0.001692	1.55	1.12	0.27	0.85
P-444	MH-444	MH-445	12 inch	390.00	0.011	0.001718	1.55	1.13	0.27	0.86
P-445	MH-445	MH-446	12 inch	395.00	0.011	0.001696	1.55	1.12	0.27	0.85
P-446	MH-446	MH-447	12 inch	339.56	0.011	0.001679	1.10	1.11	0.15	0.97
P-447	MH-432	MH-448	12 inch	355.00	0.011	0.002958	2.00	1.48	0.15	1.33
P-448	MH-448	MH-449	12 inch	350.00	0.011	0.003000	1.00	1.49	0.07	1.42
P-449	MH-449	MH-450	12 inch	350.00	0.011	0.003000	1.10	1.49	0.07	1.42
P-450	MH-450	MH-451	12 inch	350.00	0.011	0.003000	1.10	1.49	0.07	1.42
P-451	MH-451	MH-452	12 inch	300.00	0.011	0.003000	1.10	1.49	0.07	1.42

Scenario: EL TORO VIEJO - EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-452	MH-452	MH-453	12 inch	350.00	0.011	0.003000	1.10	1.49	0.07	1.42
P-453	MH-453	MH-454	12 inch	300.00	0.011	0.003000	1.10	1.49	0.07	1.42
P-454	MH-454	MH-455	12 inch	310.00	0.011	0.003000	1.10	1.49	0.07	1.42
P-455	MH-432	MH-456	15 inch	344.00	0.011	0.003692	3.30	3.00	1.17	1.82
P-456	MH-456	MH-457	15 inch	414.00	0.011	0.003720	3.21	3.01	1.17	1.83
P-457	MH-457	MH-458	15 inch	580.00	0.011	0.003690	3.21	3.00	1.17	1.82
P-458	MH-458	MH-459	15 inch	416.00	0.011	0.003702	2.66	3.00	0.85	2.15
P-459	MH-459	MH-460	15 inch	450.00	0.011	0.003711	2.88	3.01	0.85	2.15
P-460	MH-460	MH-461	15 inch	442.23	0.011	0.003686	2.88	3.00	0.85	2.14
P-461	MH-461	MH-462	15 inch	569.15	0.011	0.003690	1.92	3.00	0.41	2.59
P-462	MH-462	MH-463	15 inch	569.15	0.011	0.002829	2.10	2.62	0.41	2.22
P-463	MH-463	MH-464	15 inch	540.47	0.011	0.004626	2.03	3.36	0.36	2.99
P-464	MH-464	MH-465	15 inch	541.23	0.011	0.003695	2.13	3.00	0.36	2.64
P-465	MH-465	MH-466	15 inch	415.69	0.011	0.003705	2.13	3.00	0.36	2.64
P-466	MH-466	MH-467	12 inch	83.90	0.011	0.029201	4.07	4.65	0.36	4.29
P-467	MH-467	MH-468	12 inch	317.40	0.011	0.018021	1.72	3.65	0.22	3.43
P-468	MH-468	MH-469	12 inch	350.00	0.011	0.002000	1.63	1.22	0.22	1.00
P-469	MH-469	MH-470	12 inch	380.50	0.011	0.001997	1.51	1.22	0.22	1.00
P-470	MH-470	MH-471	12 inch	380.50	0.011	0.001997	1.51	1.22	0.22	1.00
P-471	MH-471	MH-472	12 inch	350.00	0.011	0.002000	1.43	1.22	0.20	1.02
P-472	MH-472	MH-473	12 inch	350.00	0.011	0.002000	1.46	1.22	0.20	1.02
P-473	MH-473	MH-474	12 inch	341.56	0.011	0.002020	1.46	1.22	0.20	1.02
P-474	MH-474	MH-475	12 inch	166.79	0.011	0.001979	0.61	1.21	0.03	1.18
P-475	MH-475	MH-476	12 inch	26.49	0.011	0.000755	1.11	0.75	0.03	0.72
P-476	MH-476	MH-477	12 inch	388.49	0.011	0.001570	0.65	1.08	0.03	1.05
P-477	MH-477	MH-478	12 inch	414.85	0.011	0.001495	0.66	1.05	0.03	1.02
P-478	MH-422	MH-479	15 inch	386.31	0.011	0.000802	1.84	1.40	0.25	1.14
P-479	MH-479	MH-480	15 inch	185.37	0.011	0.001079	1,17	1.62	0.25	1.37
P-480	MH-480	MH-481	15 inch	339.88	0.011	0.001089	1.24	1.63	0.25	1.37
P-481	MH-481	MH-482	15 inch	403.81	0.011	0.001065	1.26	1.61	0.25	1.36
P-482	MH-482	MH-483	15 inch	264.00	0.011	0.001098	1.49	1.64	0.25	1.38
P-483	MH-440	MH-484	18 inch	452.00	0.011	0.001504	3.04	3.11	1.24	1.88
P-484	MH-484	MH-485	12 inch	400.00	0.011	0.002250	3.22	1.29	0.97	0.32
P-485	MH-485	MH-486	12 inch	400.00	0.011	0.002000	2.53	1.22	0.97	0.24
P-486	MH-486	MH-487	12 inch	400.00	0.011	0.002000	2.48	1.22	0.97	0.24
P-487	MH-487	MH-488	12 inch	400.00	0.011	0.002000	2.48	1.22	0.97	0.24
P-488	MH-488	MH-489	12 inch	400.00	0.011	0.002000	2.48	1.22	0.97	0.24
P-489	MH-489	MH-490	12 inch	380.00	0.011	0.002000	2.48	1.22	0.97	0.24
P-490	MH-490	MH-491	12 inch	198.00	0.011	0.011919	2.88	2.97	0.92	2.05
P-491	MH-484	MH-492	15 inch	362.00	0.011	0.002210	1.22	2.32	0.21	2.11
P-492	MH-492	MH-493	15 inch	360.00	0.011	0.002194	1.47	2.31	0.21	2.10
P-493	MH-493	MH-494	15 inch	283.00	0.011	0.002191	1.47	2.31	0.21	2.10
P-494	MH-494	MH-495	15 inch	495.00	0.011	0.002202	0.93	2.32	0.09	2.23
P-495	MH-495	MH-496	15 inch	307.00	0.011	0.002182	1.05	2.30	0.09	2.22
P-496	MH-496	MH-497	15 inch	307.00	0.011	0.002280	1.06	2.36	0.09	2.27
P-497	MH-497	MH-498	15 inch	211.00	0.011	0.004929	1.08	3.46	0.06	3.40
P-498	MH-498	MH-499	15 inch	336.00	0.011	0.000417	0.70	1.01	0.06	0.94
P-510	MH-478	MH-510	12 inch	1,985.00	0.013	0.002015	0.00	1.03	0.00	1.03

Scenario: EL TORO VIEJO - EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-500	O-499	MH-500	12 inch	352.52	0.011	0.002610	0.00	1.39	0.00	1.39
P-501	MH-500	MH-501	12 inch	339.00	0.011	0.002271	0.00	1.30	0.00	1.30
P-502	MH-501	MH-502	12 inch	133.00	0.011	0.004511	0.00	1.83	0.00	1.83
P-503	MH-502	MH-503	12 inch	553.28	0.011	0.002512	0.00	1.36	0.00	1.36
P-504	MH-503	MH-504	12 inch	263.68	0.011	0.002958	0.00	1.48	0.00	1.48
P-505	MH-504	MH-505	10 inch	1,211.32	0.011	0.002749	0.00	0.88	0.00	0.88
P-506	MH-505	MH-506	10 inch	811.60	0.011	0.002785	0.00	0.88	0.00	0.88
P-507	MH-506	MH-507	10 inch	532.50	0.011	0.002779	0.00	0.88	0.00	0.88
P-508	O-432	MH-508	12 inch	2,833.00	0.013	0.002008	0.00	1.03	0.00	1.03
P-509	MH-508	MH-509	10 inch	4,801.00	0.013	0.002499	0.00	0.71	0.00	0.71

Scenario: EL TORO VIEJO - FUTURE LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-401	O-315	MH-402	36 inch	726.12	0.011	0.000744	2.28	13.89	9.25	4.64
P-402	MH-402	MH-403	36 inch	648.40	0.011	0.000540	2.38	11.84	9.25	2.58
P-403	MH-403	MH-404	36 inch	651.70	0.011	0.000660	2.45	13.09	9.25	3.83
P-404	MH-404	MH-405	36 inch	659.60	0.011	0.000531	2.50	11.73	9.25	2.48
P-405	MH-405	MH-406	36 inch	151.80	0.011	0.001779	2.59	21.48	9.25	12.23
P-406	MH-406	MH-407	36 inch	194.70	0.011	0.000565	2.70	12.11	9.25	2.86
P-407	MH-407	MH-408	36 inch	598.60	0.011	0.000601	2.65	12.49	9.25	3.24
P-408	MH-408	MH-409	36 inch	532.20	0.011	0.000225	2.53	7.65	9.25	-1.60
P-409	MH-409	MH-410	36 inch	605.80	0.011	0.000924	2.45	15.49	8.76	6.73
P-410	MH-410	MH-411	36 inch	658.10	0.011	0.000395	2.52	10.13	8.76	1.37
P-411	MH-411	MH-412	30 inch	560.10	0.011	0.001089	3.25	10.34	8.13	2.21
P-412	MH-412	MH-413	30 inch	418.20	0.011	0.000813	3.20	8.93	8.13	0.80
P-413	MH-413	MH-414	30 inch	153.10	0.011	0.000784	2.79	8.77	7.42	1.35
P-414	MH-414	MH-415	30 inch	566.70	0.011	0.000635	2.64	7.90	7.21	0.68
P-415	MH-415	MH-416	30 inch	558.90	0.011	0.000608	2.52	7.73	7.02	0.71
P-416	MH-416	MH-417	30 inch	400.40	0.011	0.000874	2.54	9.26	7.02	2.24
P-417	MH-417	MH-418	30 inch	555.70	0.011	0.000648	2.53	7.97	6.94	1.04
P-418	MH-418	MH-419	30 inch	521.80	0.011	0.000690	2.49	8.23	6.83	1.40
P-419	MH-419	MH-420	30 inch	522.90	0.011	0.000421	2.39	6.43	6.70	-0.27
P-420	MH-420	MH-421	30 inch	389.10	0.011	0.001079	2.36	10.29	6.49	3.80
P-421	MH-421	MH-422	30 inch	390.00	0.011	0.000692	2.44	8.24	6.49	1.75
P-422	MH-422	MH-423	30 inch	473.00	0.011	0.000761	2.34	8.64	6.13	2.51
P-423	MH-423	MH-424	30 inch	416.00	0.011	0.000649	2.27	7.98	5.81	2.17
P-424	MH-424	MH-425	30 inch	360.00	0.011	0.000694	2.28	8.26	5.81	2.44
P-425	MH-425	MH-426	30 inch	450.00	0.011	0.000689	2.30	8.22	5.81	2.41
P-426	MH-426	MH-427	30 inch	450.00	0.011	0.000756	2.36	8.61	5.81	2.80
P-427	MH-427	MH-428	30 inch	519.10	0.011	0.000944	2.52	9.63	5.81	3.81
P-428	MH-428	MH-429	30 inch	484.20	0.011	0.001363	2.93	11.57	5.79	5.78
P-429	MH-429	MH-430	21 inch	553.50	0.011	0.001481	2.84	4.66	2.89	1.77
P-430	MH-430	MH-431	21 inch	550.70	0.011	0.001925	3.13	5.31	2.87	2.44
P-431	MH-431	MH-432	21 inch	481.90	0.011	0.001162	2.96	4.13	2.85	1.27
P-432	MH-429	MH-433	18 inch	588.00	0.011	0.001650	3.07	3.26	2.67	0.59
P-433	MH-433	MH-434	18 inch	590.10	0.011	0.001915	3.00	3.51	2.47	1.04
P-434	MH-434	MH-435	18 inch	587.30	0.011	0.001652	3.05	3.26	2.47	0.79
P-435	MH-435	MH-436	18 inch	585.00	0.011	0.001538	2.93	3.15	2.47	0.68
P-436	MH-436	MH-437	18 inch	603.70	0.011	0.001872	3.02	3.47	2.47	1.00
P-437	MH-437	MH-438	18 inch	564.00	0.011	0.001773	3.08	3.38	2.47	0.91
P-438	MH-438	MH-439	18 inch	588.90	0.011	0.001562	2.83	3.17	2.26	0.92
P-439	MH-439	MH-440	18 inch	579.30	0.011	0.001726	2.85	3.33	2.18	1.16
P-440	MH-413	MH-441	12 inch	390.00	0.011	0.001692	2.46	1.12	0.44	0.68
P-441	MH-441	MH-442	12 inch	390.00	0.011	0.001718	1.84	1.13	0.44	0.69
P-442	MH-442	MH-443	12 inch	390.00	0.011	0.001692	1.83	1.12	0.44	0.68
P-443	MH-443	MH-444	12 inch	390.00	0.011	0.001692	1.83	1.12	0.44	0.68
P-444	MH-444	MH-445	12 inch	390.00	0.011	0.001718	1.84	1.13	0.44	0.69
P-445	MH-445	MH-446	12 inch	395.00	0.011	0.001696	1.83	1.12	0.44	0.68
P-446	MH-446	MH-447	12 inch	339.56	0.011	0.001679	1.51	1.11	0.31	0.80
P-447	MH-432	MH-448	12 inch	355.00	0.011	0.002958	2.80	1.48	0.50	0.98
P-448	MH-448	MH-449	12 inch	350.00	0.011	0.003000	2.10	1.49	0.42	1.07
P-449	MH-449	MH-450	12 inch	350.00	0.011	0.003000	2.18	1.49	0.42	1.07
P-450	MH-450	MH-451	12 inch	350.00	0.011	0.003000	2.18	1.49	0.42	1.07
P-451	MH-451	MH-452	12 inch	300.00	0.011	0.003000	2.18	1.49	0.42	1.07

Scenario: EL TORO VIEJO - FUTURE LOADS

CAPACITY REPORT

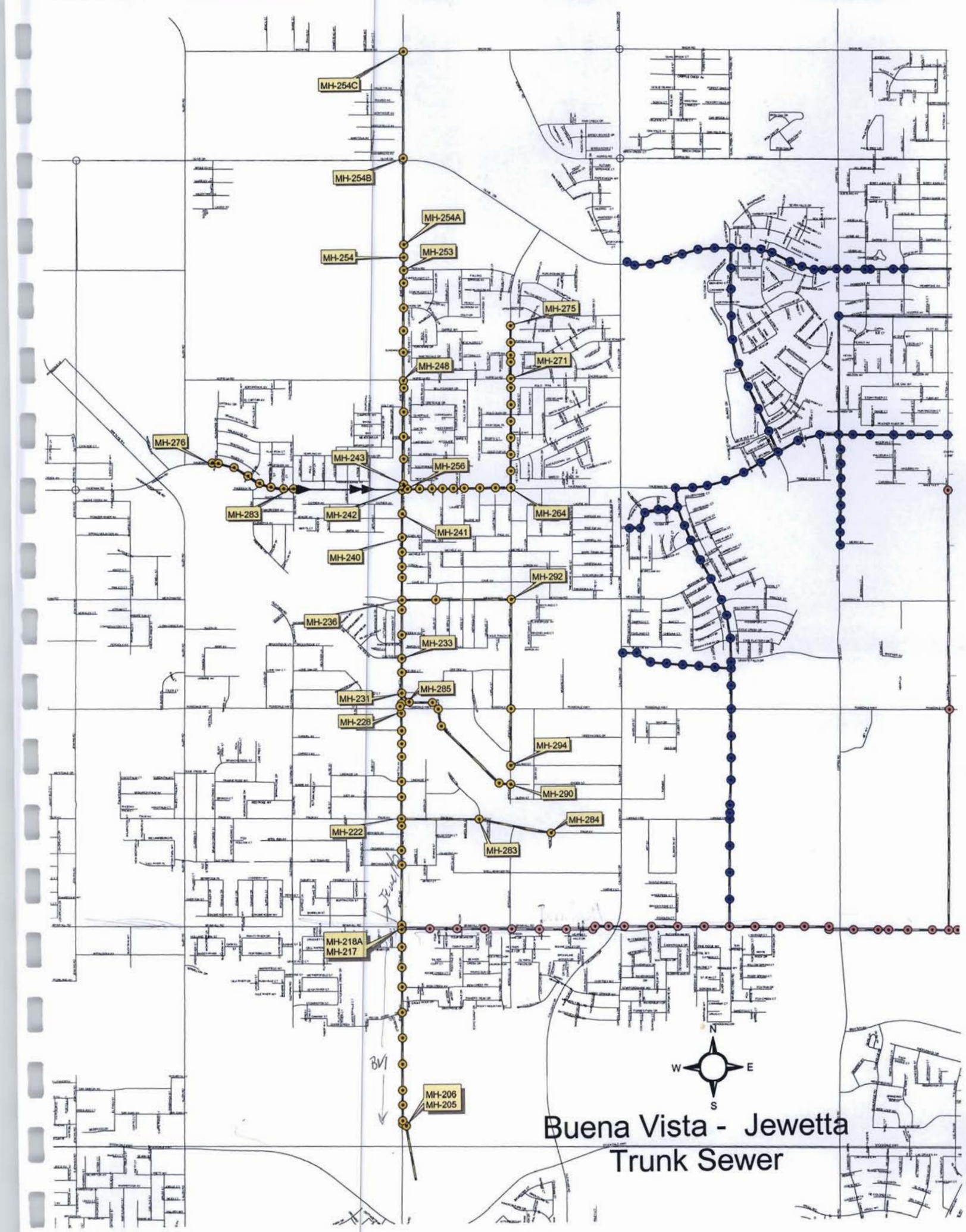
Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-452	MH-452	MH-453	12 inch	350.00	0.011	0.003000	2.18	1.49	0.42	1.07
P-453	MH-453	MH-454	12 inch	300.00	0.011	0.003000	2.18	1.49	0.42	1.07
P-454	MH-454	MH-455	12 inch	310.00	0.011	0.003000	2.18	1.49	0.42	1.07
P-455	MH-432	MH-456	15 inch	344.00	0.011	0.003692	3.39	3.00	1.85	1.15
P-456	MH-456	MH-457	15 inch	414.00	0.011	0.003720	3.69	3.01	1.85	1.16
P-457	MH-457	MH-458	15 inch	580.00	0.011	0.003690	3.69	3.00	1.85	1.15
P-458	MH-458	MH-459	15 inch	416.00	0.011	0.003702	3.32	3.00	1.54	1.46
P-459	MH-459	MH-460	15 inch	450.00	0.011	0.003711	3.50	3.01	1.54	1.47
P-460	MH-460	MH-461	15 inch	442.23	0.011	0.003686	3.49	3.00	1.54	1.45
P-461	MH-461	MH-462	15 inch	569.15	0.011	0.003690	2.92	3.00	1.13	1.87
P-462	MH-462	MH-463	15 inch	569.15	0.011	0.002829	3.00	2.62	1.13	1.50
P-463	MH-463	MH-464	15 inch	540.47	0.011	0.004626	3.02	3.36	1.09	2.27
P-464	MH-464	MH-465	15 inch	541.23	0.011	0.003695	3.14	3.00	1.09	1.91
P-465	MH-465	MH-466	15 inch	415.69	0.011	0.003705	3.13	3.00	1.09	1.91
P-466	MH-466	MH-467	12 inch	83.90	0.011	0.029201	5.01	4.65	0.74	3.91
P-467	MH-467	MH-468	12 inch	317.40	0.011	0.018021	2.60	3.65	0.60	3.06
P-468	MH-468	MH-469	12 inch	350.00	0.011	0.002000	2.36	1.22	0.60	0.62
P-469	MH-469	MH-470	12 inch	380.50	0.011	0.001997	2.14	1.22	0.60	0.62
P-470	MH-470	MH-471	12 inch	380.50	0.011	0.001997	2.14	1.22	0.60	0.62
P-471	MH-471	MH-472	12 inch	350.00	0.011	0.002000	2.05	1.22	0.55	0.66
P-472	MH-472	MH-473	12 inch	350.00	0.011	0.002000	2.09	1.22	0.55	0.66
P-473	MH-473	MH-474	12 inch	341.56	0.011	0.002020	2.09	1.22	0.55	0.67
P-474	MH-474	MH-475	12 inch	166.79	0.011	0.001979	1.75	1.21	0.41	0.80
P-475	MH-475	MH-476	12 inch	26.49	0.011	0.000755	2.38	0.75	0.41	0.34
P-476	MH-476	MH-477	12 inch	388.49	0.011	0.001570	1.75	1.08	0.41	0.67
P-477	MH-477	MH-478	12 inch	414.85	0.011	0.001495	1.60	1.05	0.36	0.69
P-478	MH-422	MH-479	15 inch	386.31	0.011	0.000802	2.02	1.40	0.36	1.04
P-479	MH-479	MH-480	15 inch	185.37	0.011	0.001079	1.31	1.62	0.36	1.26
P-480	MH-480	MH-481	15 inch	339.88	0.011	0.001089	1.39	1.63	0.36	1.27
P-481	MH-481	MH-482	15 inch	403.81	0.011	0.001065	1.42	1.61	0.36	1.25
P-482	MH-482	MH-483	15 inch	264.00	0.011	0.001098	1.64	1.64	0.36	1.28
P-483	MH-440	MH-484	18 inch	452.00	0.011	0.001504	3.56	3.11	2.18	0.94
P-484	MH-484	MH-485	12 inch	400.00	0.011	0.002250	3.12	1.29	1.35	-0.06
P-485	MH-485	MH-486	12 inch	400.00	0.011	0.002000	2.68	1.22	1.35	-0.13
P-486	MH-486	MH-487	12 inch	400.00	0.011	0.002000	2.66	1.22	1.35	-0.13
P-487	MH-487	MH-488	12 inch	400.00	0.011	0.002000	2.66	1.22	1.35	-0.13
P-488	MH-488	MH-489	12 inch	400.00	0.011	0.002000	2.66	1.22	1.35	-0.13
P-489	MH-489	MH-490	12 inch	380.00	0.011	0.002000	2.66	1.22	1.35	-0.13
P-490	MH-490	MH-491	12 inch	198.00	0.011	0.011919	3.31	2.97	1.30	1.67
P-491	MH-484	MH-492	15 inch	362.00	0.011	0.002210	2.02	2.32	0.78	1.54
P-492	MH-492	MH-493	15 inch	360.00	0.011	0.002194	2.35	2.31	0.78	1.53
P-493	MH-493	MH-494	15 inch	283.00	0.011	0.002191	2.35	2.31	0.78	1.53
P-494	MH-494	MH-495	15 inch	495.00	0.011	0.002202	2.13	2.32	0.66	1.66
P-495	MH-495	MH-496	15 inch	307.00	0.011	0.002182	2.22	2.30	0.66	1.65
P-496	MH-496	MH-497	15 inch	307.00	0.011	0.002280	2.24	2.36	0.66	1.70
P-497	MH-497	MH-498	15 inch	211.00	0.011	0.004929	2.45	3.46	0.64	2.83
P-498	MH-498	MH-499	15 inch	336.00	0.011	0.000417	1.86	1.01	0.64	0.37
P-510	MH-478	MH-510	12 inch	1,985.00	0.013	0.002015	1.57	1.03	0.34	0.70

Scenario: EL TORO VIEJO - FUTURE LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-500	O-499	MH-500	12 inch	352.52	0.011	0.002610	2.11	1.39	0.57	0.82
P-501	MH-500	MH-501	12 inch	339.00	0.011	0.002271	2.24	1.30	0.57	0.73
P-502	MH-501	MH-502	12 inch	133.00	0.011	0.004511	2.50	1.83	0.57	1.26
P-503	MH-502	MH-503	12 inch	553.28	0.011	0.002512	2.43	1.36	0.57	0.79
P-504	MH-503	MH-504	12 inch	263.68	0.011	0.002958	2.38	1.48	0.57	0.91
P-505	MH-504	MH-505	10 inch	1,211.32	0.011	0.002749	2.83	0.88	0.57	0.31
P-506	MH-505	MH-506	10 inch	811.60	0.011	0.002785	2.42	0.88	0.57	0.31
P-507	MH-506	MH-507	10 inch	532.50	0.011	0.002779	2.43	0.88	0.57	0.31
P-508	O-432	MH-508	12 inch	2,833.00	0.013	0.002008	1.43	1.03	0.45	0.58
P-509	MH-508	MH-509	10 inch	4,801.00	0.013	0.002499	1.15	0.71	0.15	0.56

City Planned Sewer Area No. 4
(Buena Vista Trunk Sewer)


MH-254C
MH-254B
MH-254A
MH-254
MH-253
MH-275
MH-271
MH-248
MH-276
MH-243
MH-256
MH-283
MH-242
MH-264
MH-241
MH-240
MH-292
MH-236
MH-233
MH-285
MH-231
MH-228
MH-294
MH-290
MH-284
MH-222
MH-283
MH-218A
MH-217
MH-206
MH-205
N
W
E
S
Buena Vista - Jewetta
Trunk Sewer

Projected Equivalent Single Family Dwellings - City Planned Sewer Area 4
Buena Vista Trunk Sewer
Project No: 02621
Date: March 20, 2004

SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
212	29/27	31C	LR	230	6.00	1380	CITY
	29/26	36D	LMR	41	9.00	369	CITY
					Total	1749	
218	29/27	30C	SR	47	3.00	141	
	29/27	30C	SR	18	3.00	54	CITY
	29/27	30C	LMR	14	9.00	126	CITY
	29/27	30C	GC	10	12.82	128	CITY
	29/26	25D	ER	17	0.95	16	
					Total	465	
231	29/26	19C	SR	0	3.00	74	septic
					Total	74	
233	29/26	24A	SR	0	3.00	94	dry
					Total	94	
248	29/26	13B	R-1A	20	0.00	0	CITY
	29/26	13B	LR	57	6.00	342	CITY
	29/26	13D	LR	14	6.00	84	CITY
					Total	426	
253	29/26	13B	LR	70	6.00	420	CITY
	29/26	13B	GC	6	12.82	77	CITY
					Total	497	
254A	29/27	7C	LR	54	6.00	324	CITY
					Total	324	
254B	29/27	7A	GC	15	12.82	192	CITY
					Total	192	
254C	29/27	7A	LR	166	6.00	996	CITY
					Total	996	
275	29/27	17B	GC	16	12.82	205	CITY
					Total	205	
283	29/26	24B	SR	80	3.00	240	CITY
	29/26	24B	OS-P	9	0.08	1	CITY
	29/26	24B	PS	9	3.50	32	
	29/26	24D	HMR	20	15.68	314	CITY
	29/26	13D	LR	49	6.00	294	CITY
					Total	880	

SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
284	29/27	30A	HMR	10	15.68	157	
	29/27	30A	SR	0	3.00	221	septic
					Total	378	
290	29/27	30A	ER	0	0.95	56	septic
	29/27	30B	SR	0	3.00	153	septic
					Total	209	
291	29/27	19C	SR	0	3.00	29	dry
	29/27	19C	SR	0	3.00	55	dry
	29/27	19C	SR	0	3.00	123	septic
	29/27	19C	SR	15	3.00	45	
	29/28	19A	SR	32	3.00	96	
	29/27	19A	SR	0	3.00	36	dry
					Total	384	
292	29/27	19A	SR	0	3.00	295	septic
	29/27	19B	SR	0	3.00	207	septic
	29/27	19D	SR	0	3.00	44	septic
	29/27	19D	SR	37	3.00	111	
					Total	657	
293	29/27	30A	SR	0	3.00	19	septic
	29/27	30A	GC	6	12.82	77	
	29/27	30B	GC	16	12.82	205	
	29/27	19C	GC	9	12.82	115	
	29/27	19C	LMR/LR	0	9.00	32	septic
	29/27	19C	LMR/LR	16	9.00	144	
	29/27	19D	LI	12	17.32	208	
	29/27	19D	GC	22	12.82	282	
					Total	1082	
294	29/27	30B	HMR	9	15.68	141	
	29/27	30B	LMR/LR	0	9.00	62	septic
	29/27	30B	SR	0	3.00	77	
					Total	280	
313	29/27	29C	LR	52	6.00	312	
	29/27	29C	ER	7	12.82	90	
	29/27	29C	GC	14	12.82	179	CITY
	29/27	30D	SR	150	3.00	450	
					Total	1031	
315	29/27	32B	GC	34	12.82	436	CITY
	29/27	29D	PS	3	3.50	11	CITY
	29/27	29D	OS-P	21	0.08	2	CITY
	29/27	29D	LR	77	2.70	208	CITY
	29/27	29D	GC	14	12.82	179	CITY
					Total	835	

SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots
409	29/27	29A	GC	7	12.82	90
	29/27	29A	HMR	7	15.68	110
	29/27	29A	SI	20	17.32	346
	29/27	29A	ER	74	0.95	70
	29/27	29A	PS	10	3.50	35
	29/27	29A	LMR/LR	25	9.00	225
	29/27	29A	OS-P	10	0.08	1
					Total	877
					Sub-Total	**11,636**
					City	**6,561**
					Grand Total	**5,075**

Scenario: BUENA VISTA EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-204	O-204	MH-205	42 inch	1,295.99	0.011	0.000918	3.74	23.29	11.49	11.80
P-205	MH-205	MH-206	42 inch	7.00	0.011	0.001429	3.48	29.04	11.49	17.56
P-206	MH-206	MH-207	42 inch	94.31	0.011	0.000848	3.29	22.38	11.49	10.89
P-207	MH-207	MH-208	42 inch	80.05	0.011	0.000750	3.13	21.04	11.49	9.55
P-208	MH-208	MH-209	42 inch	382.07	0.011	0.000785	3.07	21.53	11.49	10.04
P-209	MH-209	MH-210	42 inch	345.15	0.011	0.000753	3.06	21.09	11.49	9.60
P-210	MH-210	MH-211	42 inch	622.34	0.011	0.000755	3.09	21.12	11.49	9.63
P-211	MH-211	MH-212	42 inch	622.58	0.011	0.000739	3.15	20.89	11.49	9.40
P-212	MH-212	MH-213	42 inch	610.73	0.011	0.000753	3.12	21.09	11.24	9.85
P-213	MH-213	MH-214	42 inch	610.74	0.011	0.000753	3.15	21.09	11.22	9.87
P-214	MH-214	MH-215	42 inch	472.01	0.011	0.000742	3.12	20.93	11.11	9.82
P-215	MH-215	MH-216	42 inch	494.28	0.011	0.000769	3.05	21.31	10.81	10.50
P-216	MH-216	MH-217	42 inch	434.03	0.011	0.000737	3.05	20.87	10.76	10.10
P-217	MH-217	MH-218A	42 inch	22.23	0.011	0.001350	2.97	28.23	10.76	17.47
P-218A	MH-218A	MH-218B	30 inch	100.70	0.011	0.000794	3.19	8.83	3.18	5.65
P-218B	MH-218B	MH-219	30 inch	1,457.00	0.011	0.000803	2.56	8.88	3.18	5.69
P-219	MH-219	MH-220	30 inch	366.07	0.011	0.000792	2.56	8.82	3.08	5.74
P-220	MH-220	MH-221	30 inch	600.00	0.011	0.000800	2.37	8.86	3.08	5.78
P-221	MH-221	MH-222	30 inch	176.80	0.011	0.000848	2.28	9.13	3.08	6.04
P-222	MH-222	MH-223	27 inch	530.00	0.011	0.001170	2.57	8.09	3.08	5.01
P-223	MH-223	MH-224	27 inch	477.42	0.011	0.000649	2.47	6.03	3.08	2.95
P-224	MH-224	MH-225	27 inch	595.00	0.011	0.000790	2.31	6.65	3.08	3.57
P-225	MH-225	MH-226	27 inch	316.00	0.011	0.000791	2.29	6.65	3.08	3.57
P-226	MH-226	MH-227	27 inch	316.04	0.011	0.000823	2.25	6.78	3.08	3.70
P-227	MH-227	MH-228	27 inch	435.59	0.011	0.000804	2.26	6.71	3.08	3.62
P-228	MH-228	MH-229	24 inch	164.55	0.011	0.000790	2.83	4.86	3.08	1.77
P-229	MH-229	MH-230	24 inch	71.00	0.011	0.000704	2.45	4.59	3.08	1.50
P-230	MH-230	MH-231	24 inch	253.53	0.011	0.000749	2.27	4.73	3.08	1.65
P-231	MH-231	MH-232	24 inch	505.00	0.011	0.000792	2.24	4.86	3.08	1.78
P-232	MH-232	MH-233	24 inch	333.36	0.011	0.000810	2.25	4.92	3.08	1.84
P-233	MH-233	MH-234	24 inch	566.72	0.011	0.000794	1.96	4.87	2.55	2.32
P-234	MH-234	MH-235	24 inch	600.00	0.011	0.000350	1.91	3.23	2.55	0.68
P-235	MH-235	MH-236	24 inch	233.75	0.011	0.001968	2.13	7.67	2.55	5.12
P-236	MH-236	MH-237	24 inch	535.00	0.011	0.000598	3.18	4.23	2.55	1.68
P-237	MH-237	MH-238	24 inch	265.00	0.011	0.000604	2.09	4.25	2.55	1.70
P-238	MH-238	MH-239	24 inch	349.80	0.011	0.000600	1.96	4.23	2.55	1.69
P-283	MH-222	MH-283	10 inch	1,894.00	0.013	0.002503	0.00	0.71	0.00	0.71
P-284	MH-283	MH-284	10 inch	1,788.00	0.013	0.002500	0.00	0.71	0.00	0.71
P-285	MH-231	MH-285	10 inch	278.00	0.013	0.002518	0.00	0.71	0.00	0.71
P-286	MH-285	MH-286	10 inch	564.00	0.013	0.002500	0.00	0.71	0.00	0.71
P-287	MH-286	MH-287	10 inch	215.00	0.013	0.002512	0.00	0.71	0.00	0.71
P-288	MH-287	MH-288	10 inch	428.00	0.013	0.002500	0.00	0.71	0.00	0.71
P-289	MH-288	MH-289	10 inch	1,968.00	0.013	0.002500	0.00	0.71	0.00	0.71
P-290	MH-289	MH-290	10 inch	285.00	0.013	0.002491	0.00	0.71	0.00	0.71
P-291	O-236	MH-291a	12 inch	809.00	0.013	0.002002	0.00	1.03	0.00	1.03
P-292	MH-291a	MH-292	12 inch	1,842.00	0.013	0.001998	0.00	1.03	0.00	1.03
P-293	MH-292	MH-293	12 inch	2,632.00	0.013	0.001998	0.00	1.03	0.00	1.03
P-294	MH-293	MH-294	10 inch	1,377.00	0.013	0.002505	0.00	0.71	0.00	0.71

Scenario: BUENA VISTA EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-239	O-239	MH-240	24 inch	349.79	0.011	0.000600	2.06	4.23	2.55	1.69
P-240	MH-240	MH-241	24 inch	573.83	0.011	0.000593	1.97	4.21	2.55	1.66
P-241	MH-241	MH-242	24 inch	573.83	0.011	0.004514	2.96	11.61	2.55	9.06
P-242A	WW-201	MH-243	21 inch	70.50	0.011	0.000993	2.74	3.81	1.01	2.80
P-242B	MH-243	MH-244	21 inch	606.96	0.011	0.000906	2.14	3.64	1.01	2.63
P-243	MH-244	MH-245	21 inch	538.00	0.011	0.000892	1.82	3.61	1.01	2.60
P-244	MH-245	MH-246	21 inch	600.00	0.011	0.000900	1.00	3.63	0.35	3.28
P-245	MH-246	MH-247	21 inch	563.00	0.011	0.000906	1.26	3.64	0.35	3.29
P-246	MH-247	MH-248	21 inch	172.78	0.011	0.000926	1.21	3.68	0.35	3.33
P-247	MH-248	MH-249	18 inch	670.28	0.011	0.001104	1.95	2.67	0.35	2.32
P-248	MH-249	MH-250	18 inch	522.72	0.011	0.001110	1.01	2.67	0.20	2.48
P-249	MH-250	MH-251	18 inch	546.61	0.011	0.001098	1.12	2.66	0.20	2.46
P-250	MH-251	MH-252	18 inch	600.00	0.011	0.001083	0.83	2.64	0.11	2.53
P-251	MH-252	MH-253	18 inch	310.06	0.011	0.001129	0.91	2.70	0.11	2.58
P-252	MH-253	MH-254	12 inch	313.00	0.011	0.002013	1.73	1.22	0.11	1.11
P-253	MH-254	MH-254A	12 inch	300.00	0.011	0.002000	1.18	1.22	0.11	1.10
P-254A	MH-254A	MH-254B	12 inch	2,087.00	0.013	0.003301	0.00	1.32	0.00	1.32
P-254B	MH-254B	MH-254C	12 inch	2,578.00	0.013	0.002002	0.00	1.03	0.00	1.03
P-255A	WW-201	MH-256	12 inch	92.00	0.011	0.002283	3.51	1.30	1.24	0.06
P-255B	MH-256	MH-257	12 inch	298.74	0.011	0.002008	2.90	1.22	1.24	-0.02
P-255C	MH-257	MH-258	12 inch	298.73	0.011	0.001975	2.58	1.21	1.24	-0.03
P-256	MH-258	MH-259	12 inch	263.03	0.011	0.002015	2.50	1.22	1.24	-0.02
P-257	MH-259	MH-260	12 inch	263.49	0.011	0.002011	2.44	1.22	1.24	-0.02
P-258	MH-260	MH-261	12 inch	263.48	0.011	0.001974	2.44	1.21	1.24	-0.03
P-259	MH-261	MH-262	12 inch	384.58	0.011	0.002002	2.44	1.22	1.24	-0.02
P-260	MH-262	MH-263	12 inch	378.52	0.011	0.002008	2.31	1.22	1.17	0.05
P-261	MH-263	MH-264	12 inch	373.52	0.011	0.002008	2.31	1.22	1.17	0.05
P-262	MH-264	MH-265	12 inch	400.00	0.011	0.002000	2.31	1.22	1.17	0.04
P-263	MH-265	MH-266	12 inch	400.00	0.011	0.002000	1.91	1.22	0.97	0.25
P-264	MH-266	MH-267	12 inch	400.00	0.011	0.002000	1.87	1.22	0.89	0.33
P-265	MH-267	MH-268	12 inch	400.00	0.011	0.002000	2.11	1.22	0.82	0.40
P-266	MH-268	MH-269	12 inch	400.00	0.011	0.002000	2.36	1.22	0.82	0.40
P-267	MH-269	MH-270	12 inch	400.00	0.011	0.002000	2.30	1.22	0.78	0.44
P-268	MH-270	MH-271	12 inch	220.45	0.011	0.001996	2.32	1.22	0.78	0.44
P-269	MH-271	MH-272	12 inch	385.62	0.011	0.001997	2.32	1.22	0.78	0.44
P-270	MH-272	MH-273	12 inch	167.00	0.011	0.002036	2.03	1.23	0.63	0.60
P-271	MH-273	MH-274	12 inch	307.00	0.011	0.001987	1.99	1.21	0.55	0.67
P-272	MH-274	MH-275	12 inch	400.00	0.011	0.002000	2.00	1.22	0.51	0.71
P-273A	WW-202	MH-276	18 inch	73.50	0.011	0.008299	3.30	7.31	0.56	6.75
P-273B	MH-276	MH-277	10 inch	150.19	0.011	0.002464	2.72	0.83	0.56	0.27
P-274	MH-277	MH-278	10 inch	400.00	0.011	0.002525	1.90	0.84	0.39	0.45
P-275	MH-278	MH-279	10 inch	400.00	0.011	0.002475	2.05	0.83	0.39	0.44
P-276	MH-279	MH-280	10 inch	326.94	0.011	0.002508	1.62	0.84	0.26	0.58
P-277	MH-280	MH-281	10 inch	302.33	0.011	0.002481	1.77	0.83	0.26	0.58
P-278	MH-281	MH-282	10 inch	302.33	0.011	0.002514	1.77	0.84	0.26	0.58
P-279	MH-282	MH-283	10 inch	239.51	0.011	0.002463	1.77	0.83	0.26	0.57

Scenario: BUENA VISTA FUTURE LOADS

CAPACITY REPORT

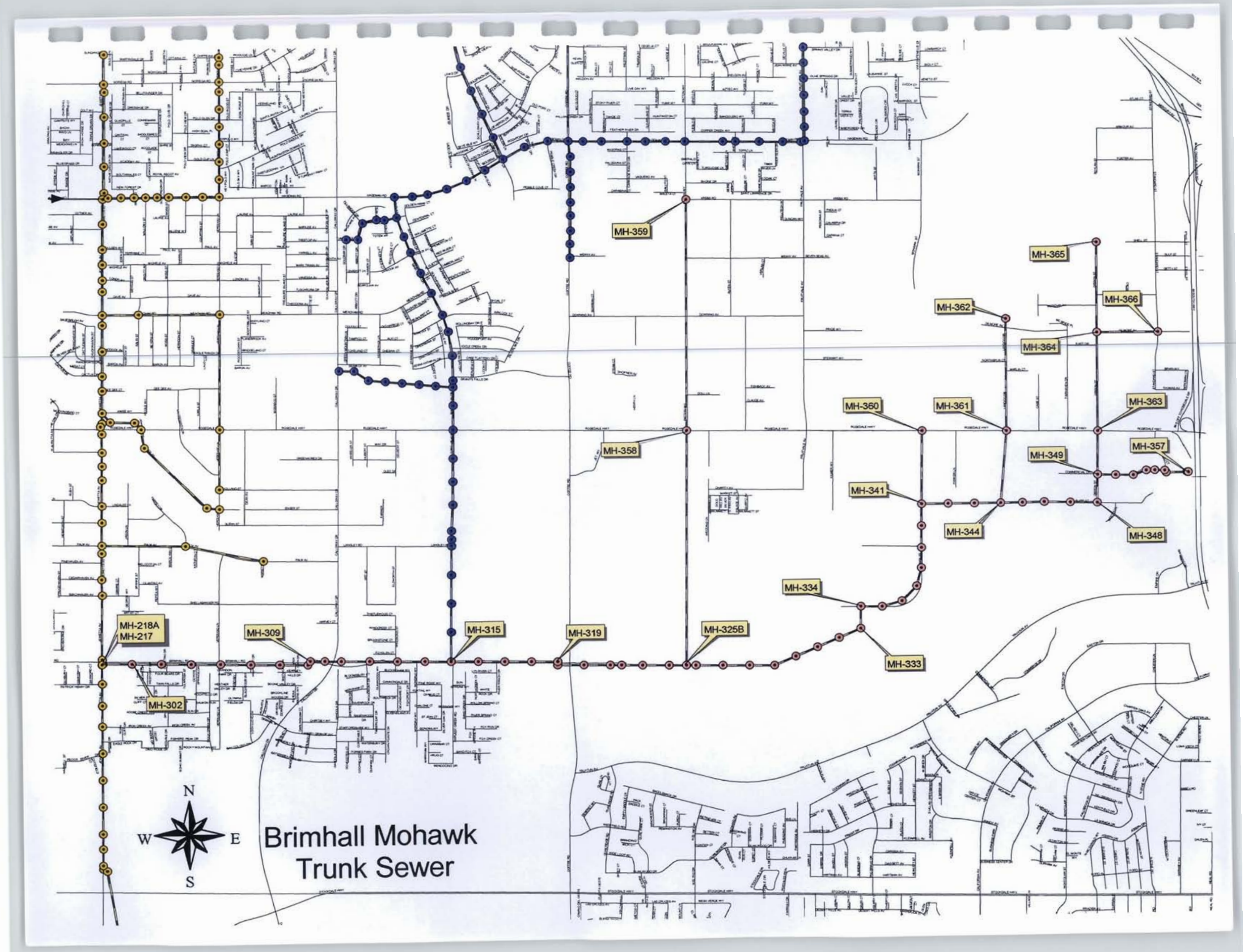
Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-204	O-204	MH-205	42 inch	1,295.99	0.011	0.000918	4.22	23.29	24.17	-0.89
P-205	MH-205	MH-206	42 inch	7.00	0.011	0.001429	4.13	29.04	24.17	4.87
P-206	MH-206	MH-207	42 inch	94.31	0.011	0.000848	4.04	22.38	24.17	-1.79
P-207	MH-207	MH-208	42 inch	80.05	0.011	0.000750	3.96	21.04	24.17	-3.13
P-208	MH-208	MH-209	42 inch	382.07	0.011	0.000785	3.90	21.53	24.17	-2.64
P-209	MH-209	MH-210	42 inch	345.15	0.011	0.000753	3.89	21.09	24.17	-3.08
P-210	MH-210	MH-211	42 inch	622.34	0.011	0.000755	3.89	21.12	24.17	-3.05
P-211	MH-211	MH-212	42 inch	622.58	0.011	0.000739	3.89	20.89	24.17	-3.28
P-212	MH-212	MH-213	42 inch	610.73	0.011	0.000753	3.68	21.09	22.87	-1.78
P-213	MH-213	MH-214	42 inch	610.74	0.011	0.000753	3.68	21.09	22.86	-1.77
P-214	MH-214	MH-215	42 inch	472.01	0.011	0.000742	3.66	20.93	22.75	-1.82
P-215	MH-215	MH-216	42 inch	494.28	0.011	0.000769	3.61	21.31	22.46	-1.16
P-216	MH-216	MH-217	42 inch	434.03	0.011	0.000737	3.61	20.87	22.42	-1.56
P-217	MH-217	MH-218A	42 inch	22.23	0.011	0.001350	3.61	28.23	22.42	5.81
P-218A	MH-218A	MH-218B	30 inch	100.70	0.011	0.000794	2.34	8.83	7.43	1.40
P-218B	MH-218B	MH-219	30 inch	1,457.00	0.011	0.000803	2.25	8.88	7.15	1.73
P-219	MH-219	MH-220	30 inch	366.07	0.011	0.000792	2.22	8.82	7.06	1.76
P-220	MH-220	MH-221	30 inch	600.00	0.011	0.000800	2.22	8.86	7.06	1.80
P-221	MH-221	MH-222	30 inch	176.80	0.011	0.000848	2.22	9.13	7.06	2.07
P-222	MH-222	MH-223	27 inch	530.00	0.011	0.001170	2.65	8.09	6.80	1.29
P-223	MH-223	MH-224	27 inch	477.42	0.011	0.000649	2.65	6.03	6.80	-0.77
P-224	MH-224	MH-225	27 inch	595.00	0.011	0.000790	2.65	6.65	6.80	-0.15
P-225	MH-225	MH-226	27 inch	316.00	0.011	0.000791	2.65	6.65	6.80	-0.15
P-226	MH-226	MH-227	27 inch	316.04	0.011	0.000823	2.65	6.78	6.80	-0.02
P-227	MH-227	MH-228	27 inch	435.59	0.011	0.000804	2.65	6.71	6.80	-0.10
P-228	MH-228	MH-229	24 inch	164.55	0.011	0.000790	3.35	4.86	6.80	-1.95
P-229	MH-229	MH-230	24 inch	71.00	0.011	0.000704	3.35	4.59	6.80	-2.22
P-230	MH-230	MH-231	24 inch	253.53	0.011	0.000749	3.35	4.73	6.80	-2.07
P-231	MH-231	MH-232	24 inch	505.00	0.011	0.000792	3.25	4.86	6.60	-1.74
P-232	MH-232	MH-233	24 inch	333.36	0.011	0.000810	3.25	4.92	6.60	-1.68
P-233	MH-233	MH-234	24 inch	566.72	0.011	0.000794	2.95	4.87	5.99	-1.13
P-234	MH-234	MH-235	24 inch	600.00	0.011	0.000350	2.95	3.23	5.99	-2.76
P-235	MH-235	MH-236	24 inch	233.75	0.011	0.001968	2.95	7.67	5.99	1.67
P-236	MH-236	MH-237	24 inch	535.00	0.011	0.000598	2.22	4.23	4.51	-0.29
P-237	MH-237	MH-238	24 inch	265.00	0.011	0.000604	2.22	4.25	4.51	-0.27
P-238	MH-238	MH-239	24 inch	349.80	0.011	0.000600	2.22	4.23	4.51	-0.28
P-283	MH-222	MH-283	10 inch	1,894.00	0.013	0.002503	1.41	0.71	0.31	0.40
P-284	MH-283	MH-284	10 inch	1,788.00	0.013	0.002500	1.69	0.71	0.31	0.40
P-285	MH-231	MH-285	10 inch	278.00	0.013	0.002518	0.52	0.71	0.18	0.53
P-286	MH-285	MH-286	10 inch	564.00	0.013	0.002500	0.52	0.71	0.18	0.52
P-287	MH-286	MH-287	10 inch	215.00	0.013	0.002512	0.52	0.71	0.18	0.52
P-288	MH-287	MH-288	10 inch	428.00	0.013	0.002500	0.72	0.71	0.18	0.52
P-289	MH-288	MH-289	10 inch	1,968.00	0.013	0.002500	1.21	0.71	0.18	0.52
P-290	MH-289	MH-290	10 inch	285.00	0.013	0.002491	1.41	0.71	0.18	0.52
P-291	O-236	MH-291a	12 inch	809.00	0.013	0.002002	3.59	1.03	1.48	-0.45
P-292	MH-291a	MH-292	12 inch	1,842.00	0.013	0.001998	2.43	1.03	1.23	-0.20
P-293	MH-292	MH-293	12 inch	2,632.00	0.013	0.001998	1.54	1.03	0.78	0.25
P-294	MH-293	MH-294	10 inch	1,377.00	0.013	0.002505	1.19	0.71	0.22	0.49

Scenario: BUENA VISTA FUTURE LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-239	O-239	MH-240	24 inch	349.79	0.011	0.000600	2.22	4.23	4.51	-0.28
P-240	MH-240	MH-241	24 inch	573.83	0.011	0.000593	2.22	4.21	4.51	-0.31
P-241	MH-241	MH-242	24 inch	573.83	0.011	0.004514	2.33	11.61	4.51	7.09
P-242A	WW-201	MH-243	21 inch	70.50	0.011	0.000993	3.61	3.81	2.48	1.33
P-242B	MH-243	MH-244	21 inch	606.96	0.011	0.000906	2.81	3.64	2.48	1.16
P-243	MH-244	MH-245	21 inch	538.00	0.011	0.000892	2.38	3.61	2.48	1.13
P-244	MH-245	MH-246	21 inch	600.00	0.011	0.000900	1.95	3.63	1.90	1.73
P-245	MH-246	MH-247	21 inch	563.00	0.011	0.000906	2.12	3.64	1.90	1.74
P-246	MH-247	MH-248	21 inch	172.78	0.011	0.000926	2.09	3.68	1.90	1.79
P-247	MH-248	MH-249	18 inch	670.28	0.011	0.001104	2.43	2.67	1.63	1.03
P-248	MH-249	MH-250	18 inch	522.72	0.011	0.001110	2.18	2.67	1.50	1.17
P-249	MH-250	MH-251	18 inch	546.61	0.011	0.001098	2.22	2.66	1.50	1.15
P-250	MH-251	MH-252	18 inch	600.00	0.011	0.001083	2.16	2.64	1.44	1.20
P-251	MH-252	MH-253	18 inch	310.06	0.011	0.001129	2.17	2.70	1.44	1.26
P-252	MH-253	MH-254	12 inch	313.00	0.011	0.002013	3.29	1.22	1.13	0.09
P-253	MH-254	MH-254A	12 inch	300.00	0.011	0.002000	2.56	1.22	1.13	0.08
P-254A	MH-254A	MH-254B	12 inch	2,087.00	0.013	0.003301	2.26	1.32	0.84	0.49
P-254B	MH-254B	MH-254C	12 inch	2,578.00	0.013	0.002002	2.14	1.03	0.75	0.28
P-255A	WW-201	MH-256	12 inch	92.00	0.011	0.002283	3.59	1.30	1.33	-0.03
P-255B	MH-256	MH-257	12 inch	298.74	0.011	0.002008	2.94	1.22	1.33	-0.11
P-255C	MH-257	MH-258	12 inch	298.73	0.011	0.001975	2.63	1.21	1.33	-0.12
P-256	MH-258	MH-259	12 inch	263.03	0.011	0.002015	2.62	1.22	1.33	-0.11
P-257	MH-259	MH-260	12 inch	263.49	0.011	0.002011	2.62	1.22	1.33	-0.11
P-258	MH-260	MH-261	12 inch	263.48	0.011	0.001974	2.62	1.21	1.33	-0.12
P-259	MH-261	MH-262	12 inch	384.58	0.011	0.002002	2.62	1.22	1.33	-0.11
P-260	MH-262	MH-263	12 inch	378.52	0.011	0.002008	2.49	1.22	1.26	-0.04
P-261	MH-263	MH-264	12 inch	373.52	0.011	0.002008	2.49	1.22	1.26	-0.04
P-262	MH-264	MH-265	12 inch	400.00	0.011	0.002000	2.49	1.22	1.26	-0.05
P-263	MH-265	MH-266	12 inch	400.00	0.011	0.002000	2.08	1.22	1.06	0.16
P-264	MH-266	MH-267	12 inch	400.00	0.011	0.002000	1.93	1.22	0.98	0.24
P-265	MH-267	MH-268	12 inch	400.00	0.011	0.002000	1.78	1.22	0.91	0.31
P-266	MH-268	MH-269	12 inch	400.00	0.011	0.002000	1.78	1.22	0.91	0.31
P-267	MH-269	MH-270	12 inch	400.00	0.011	0.002000	1.71	1.22	0.87	0.35
P-268	MH-270	MH-271	12 inch	220.45	0.011	0.001996	1.71	1.22	0.87	0.35
P-269	MH-271	MH-272	12 inch	385.62	0.011	0.001997	1.79	1.22	0.87	0.35
P-270	MH-272	MH-273	12 inch	167.00	0.011	0.002036	1.64	1.23	0.72	0.51
P-271	MH-273	MH-274	12 inch	307.00	0.011	0.001987	1.92	1.21	0.64	0.58
P-272	MH-274	MH-275	12 inch	400.00	0.011	0.002000	2.11	1.22	0.60	0.62
P-273A	WW-202	MH-276	18 inch	73.50	0.011	0.008299	4.03	7.31	1.14	6.17
P-273B	MH-276	MH-277	10 inch	150.19	0.011	0.002464	3.70	0.83	1.14	-0.30
P-274	MH-277	MH-278	10 inch	400.00	0.011	0.002525	2.78	0.84	0.98	-0.14
P-275	MH-278	MH-279	10 inch	400.00	0.011	0.002475	2.78	0.83	0.98	-0.15
P-276	MH-279	MH-280	10 inch	326.94	0.011	0.002508	2.43	0.84	0.86	-0.02
P-277	MH-280	MH-281	10 inch	302.33	0.011	0.002481	2.43	0.83	0.86	-0.02
P-278	MH-281	MH-282	10 inch	302.33	0.011	0.002514	2.43	0.84	0.86	-0.02
P-279	MH-282	MH-283	10 inch	239.51	0.011	0.002463	2.43	0.83	0.86	-0.03

City Planned Sewer Area No. 5
(Brimhall-Mohawk Trunk Sewer)


MH-359
MH-365
MH-366
MH-362
MH-364
MH-360
MH-361
MH-363
MH-358
MH-357
MH-349
MH-341
MH-344
MH-348
MH-334
MH-218A
MH-217
MH-309
MH-315
MH-319
MH-325B
MH-333
MH-302
N
W
E
S
Brimhall Mohawk
Trunk Sewer

Projected Equivalent MSIngle Family Dwellings - City Planned Sewer Area 5
Brimhall - Mohawk Trunk Sewer
Project No: 02621
Date: March 20, 2004

SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
313	29/27	29B	MSI	34	1.42	48	septic
	29/27	29C	MSI	27	1.42	38	
	29/27	29C	MSI	7	1.42	10	CITY
					Total	97	
318	29/27	29D	MSI	46	1.42	65	CITY
	29/27	28C	MSI	63	1.42	89	CITY
	29/28	28A	MSI	39	1.42	55	CITY
	29/28	29A	MSI	34	1.42	48	CITY
	29/27	29A	P	106	3.50	371	CITY
					Total	629	
325B	29/27	28B	MSI	81	1.42	115	septic
	29/27	28D	MSI	103	1.42	146	septic
	29/27	28B	MSI	2	1.42	3	
	29/27	28A	MSI	24	1.42	34	
	29/27	27A	MSI	95	1.42	135	
	29/27	27A	MSI	6	1.42	9	
	29/27	28C&D	MSI	226	1.42	321	
	29/27	33B	MSI	50	1.42	71	
					Total	834	
334	29/27	27C	MSI	13	1.42	18	septic
	29/27	27C	MSI	29	1.42	41	
	29/27	27C	MSI	107	1.42	152	
					Total	212	
335	29/27	27D	MSI	10	1.42	14	septic
	29/27	27D	MSI	60	1.42	85	
					Total	99	
341	29/27	27A	MSI	13	1.42	18	
	29/27	27B	MSI	144	1.42	204	
					Total	223	
348	29/27	26A	MSI	16	1.42	23	CITY
	29/27	26A	P	4	3.50	14	CITY
					Total	37	

SSMH No.	T. & R.	Sect. & Qtr.	Land Use	Area (acres)	Lots/Acre	No. Lots	
358	29/27	21C	MSI	30	1.42	43	septic
	29/27	21D	MSI	52	1.42	74	septic
	29/27	28B	MSI	22	1.42	31	septic
	29/27	28A	MSI	22	1.42	31	CITY
	29/27	21C	MSI	106	1.42	151	
	29/27	21D	MSI	93	1.42	132	
	29/27	28A	MSI	74	1.42	105	CITY
	29/27	28B	MSI	9	1.42	13	
					Total	579	
359	29/27	21A	MSI	18	1.42	26	septic
	29/27	21B	MSI	139	1.42	197	septic
	29/27	22A	MSI	69	1.42	98	septic
	29/27	21A	MSI	44	1.42	62	
	29/27	21B	MSI	14	1.42	20	
					Total	403	
360	29/27	27A	MSI	46	1.42	65	septic
	29/27	27B	MSI	16	1.42	23	septic
	29/27	22C	MSI	143	1.42	203	
	29/27	22D	MSI	72	1.42	102	
					Total	393	
362	29/27	22B	MSI	4	1.42	6	septic
	29/27	22D	MSI	67	1.42	95	septic
	29/27	23A	MSI	12	1.42	17	septic
	29/27	23C	MSI	74	1.42	105	septic
	29/27	22B	MSI	68	1.42	97	
					Total	320	
363	29/27	26A	MSI	47	1.42	67	septic
					Total	67	
365	29/27	23A	MSI	116	1.42	165	septic
	29/27	23A	MSI	59	1.42	84	
					Total	249	
366	29/27	23C	MSI	77	1.42	109	septic
					Total	109	
					Sub-Total	***4,250***	
					City	***812***	
					Grand Total	***3,438***	

Scenario: BRIMHALL MOHAWK EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-301	O-218A	MH-302	42 inch	667.50	0.011	0.000539	2.27	17.85	7.58	10.27
P-302	MH-302	MH-303	42 inch	668.50	0.011	0.000748	2.47	21.02	7.57	13.44
P-303	MH-303	MH-304	42 inch	666.00	0.011	0.000781	2.71	21.47	7.54	13.93
P-304	MH-304	MH-305	42 inch	663.50	0.011	0.000543	2.71	17.90	7.51	10.39
P-305	MH-305	MH-306	42 inch	672.50	0.011	0.000580	2.56	18.51	7.32	11.18
P-306	MH-306	MH-307	42 inch	655.50	0.011	0.000839	2.72	22.26	7.32	14.94
P-307	MH-307	MH-308	42 inch	646.80	0.011	0.000819	2.90	22.00	7.29	14.71
P-308	MH-308	MH-309	42 inch	95.00	0.011	0.000632	3.23	19.31	7.27	12.04
P-309	MH-309	MH-310	42 inch	323.00	0.011	0.000650	2.94	19.59	7.27	12.32
P-310	MH-310	MH-311	42 inch	382.60	0.011	0.000183	2.56	10.39	7.27	3.12
P-311	MH-311	MH-312	36 inch	651.90	0.011	0.000445	3.12	10.74	6.93	3.82
P-312	MH-312	MH-313	36 inch	635.20	0.011	0.000756	2.73	14.00	6.93	7.07
P-313	MH-313	MH-314	36 inch	632.30	0.011	0.000933	2.86	15.56	6.80	8.76
P-314	MH-314	MH-315	36 inch	626.00	0.011	0.000543	2.76	11.87	6.66	5.21
P-315	MH-315	MH-316	18 inch	600.00	0.011	0.001417	2.63	3.02	0.82	2.20
P-316	MH-316	MH-317	18 inch	600.00	0.011	0.001350	2.00	2.95	0.82	2.13
P-317	MH-317	MH-318	18 inch	600.00	0.011	0.001333	1.98	2.93	0.82	2.11
P-318	MH-318	MH-319	18 inch	600.02	0.011	0.001350	1.81	2.95	0.70	2.24
P-319	MH-319	MH-320	18 inch	75.00	0.011	0.001333	1.76	2.93	0.70	2.23
P-320	MH-320	MH-321	18 inch	600.00	0.011	0.001350	1.80	2.95	0.70	2.24
P-321	MH-321	MH-322	18 inch	600.00	0.011	0.000783	1.57	2.25	0.62	1.63
P-322	MH-322	MH-323	18 inch	322.00	0.011	0.001087	1.59	2.65	0.62	2.03
P-323	MH-323	MH-324	18 inch	470.00	0.011	0.001106	1.67	2.67	0.62	2.05
P-324	MH-324	MH-325A	18 inch	573.00	0.011	0.001152	1.70	2.72	0.62	2.10
P-325A	MH-325A	MH-325B	18 inch	397.00	0.011	0.001108	1.70	2.67	0.62	2.05
P-325B	MH-325B	MH-326	18 inch	203.00	0.011	0.001084	1.64	2.64	0.62	2.02
P-326	MH-326	MH-327	18 inch	600.00	0.011	0.001100	1.66	2.66	0.62	2.04
P-327	MH-327	MH-328	18 inch	600.00	0.011	0.001100	1.69	2.66	0.62	2.04
P-328	MH-328	MH-329	18 inch	572.32	0.011	0.001101	1.69	2.66	0.62	2.04
P-329	MH-329	MH-330	18 inch	531.00	0.011	0.001092	1.90	2.65	0.62	2.03
P-330	MH-330	MH-331	18 inch	531.00	0.011	0.001111	1.69	2.67	0.62	2.05
P-331	MH-331	MH-332	18 inch	531.00	0.011	0.001092	1.69	2.65	0.62	2.03
P-332	MH-332	MH-333	18 inch	535.52	0.011	0.001102	1.69	2.66	0.62	2.04
P-333	MH-333	MH-334	18 inch	497.32	0.011	0.001106	1.90	2.67	0.62	2.05
P-334	MH-334	MH-335	18 inch	475.08	0.011	0.001095	1.90	2.65	0.62	2.03
P-335	MH-335	MH-336	18 inch	466.92	0.011	0.001114	1.69	2.68	0.62	2.06
P-336	MH-336	MH-337	18 inch	468.00	0.011	0.001090	1.69	2.65	0.62	2.03
P-337	MH-337	MH-338	18 inch	469.28	0.011	0.001108	1.69	2.67	0.62	2.05
P-338	MH-338	MH-339	18 inch	460.51	0.011	0.001086	1.68	2.64	0.62	2.02
P-339	MH-339	MH-340	18 inch	500.00	0.011	0.001100	1.68	2.66	0.62	2.04
P-340	MH-340	MH-341	18 inch	501.41	0.011	0.001097	1.69	2.66	0.62	2.04
P-341	MH-341	MH-342	18 inch	600.00	0.011	0.001100	1.90	2.66	0.62	2.04
P-342	MH-342	MH-343	18 inch	600.00	0.011	0.001100	1.69	2.66	0.62	2.04
P-343	MH-343	MH-344	18 inch	600.00	0.011	0.001100	1.69	2.66	0.62	2.04
P-344	MH-344	MH-345	18 inch	500.00	0.011	0.001100	1.69	2.66	0.62	2.04
P-345	MH-345	MH-346	18 inch	507.17	0.011	0.001104	1.69	2.67	0.62	2.05
P-346	MH-346	MH-347	18 inch	600.00	0.011	0.001100	1.69	2.66	0.62	2.04
P-347	MH-347	MH-348	18 inch	600.00	0.011	0.001100	1.69	2.66	0.62	2.04
P-348	MH-348	MH-349	18 inch	638.67	0.011	0.001096	1.69	2.66	0.52	2.14
P-349	MH-349	MH-350	15 inch	408.00	0.011	0.003309	2.13	2.84	0.52	2.32
P-350	MH-350	MH-351	15 inch	409.92	0.011	0.002781	2.25	2.60	0.52	2.09

Scenario: BRIMHALL MOHAWK EXISTING LOADS

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-351	MH-351	MH-352	15 inch	312.62	0.011	0.002815	2.21	2.62	0.52	2.10
P-352	MH-352	MH-353	15 inch	187.11	0.011	0.002779	2.21	2.60	0.52	2.08
P-353	MH-353	MH-354	15 inch	230.00	0.011	0.002826	2.21	2.62	0.52	2.11
P-354	MH-354	MH-355	15 inch	62.61	0.011	0.002715	1.05	2.57	0.13	2.44
P-355	MH-355	MH-356	15 inch	475.96	0.011	0.002815	1.58	2.62	0.13	2.48
P-356	MH-356	MH-357	15 inch	25.00	0.011	0.006800	1.10	4.07	0.13	3.93
P-358	MH-325B	MH-358	15 inch	5,280.00	0.013	0.001500	0.00	1.62	0.00	1.62
P-359	MH-358	MH-359	12 inch	5,280.00	0.013	0.002000	0.00	1.03	0.00	1.03
P-360	MH-341	MH-360	12 inch	1,640.00	0.013	0.002012	0.00	1.03	0.00	1.03
P-361	MH-344	MH-361	15 inch	1,640.00	0.013	0.001524	0.00	1.63	0.00	1.63
P-362	MH-361	MH-362	12 inch	2,640.00	0.013	0.002008	0.00	1.03	0.00	1.03
P-363	MH-349	MH-363	18 inch	1,004.00	0.013	0.001096	0.00	2.25	0.00	2.25
P-364	MH-363	MH-364	15 inch	2,256.00	0.013	0.001507	0.00	1.62	0.00	1.62
P-365	MH-364	MH-365	12 inch	2,054.00	0.013	0.001996	0.00	1.03	0.00	1.03
P-366	MH-364	MH-366	12 inch	1,385.00	0.013	0.002022	0.00	1.04	0.00	1.04

Scenario: BRIMHALL MOHAWK FUTURE LOADS (B)

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-301	O-218A	MH-302	42 inch	667.50	0.011	0.000539	2.41	17.85	14.99	2.86
P-302	MH-302	MH-303	42 inch	668.50	0.011	0.000748	2.41	21.02	14.98	6.04
P-303	MH-303	MH-304	42 inch	666.00	0.011	0.000781	2.40	21.47	14.95	6.52
P-304	MH-304	MH-305	42 inch	663.50	0.011	0.000543	2.40	17.90	14.92	2.98
P-305	MH-305	MH-306	42 inch	672.50	0.011	0.000580	2.37	18.51	14.75	3.76
P-306	MH-306	MH-307	42 inch	655.50	0.011	0.000839	2.37	22.26	14.75	7.51
P-307	MH-307	MH-308	42 inch	646.80	0.011	0.000819	2.37	22.00	14.72	7.28
P-308	MH-308	MH-309	42 inch	95.00	0.011	0.000632	2.36	19.31	14.70	4.61
P-309	MH-309	MH-310	42 inch	323.00	0.011	0.000650	2.36	19.59	14.70	4.90
P-310	MH-310	MH-311	42 inch	382.60	0.011	0.000183	2.36	10.39	14.70	-4.30
P-311	MH-311	MH-312	36 inch	651.90	0.011	0.000445	3.15	10.74	14.38	-3.64
P-312	MH-312	MH-313	36 inch	635.20	0.011	0.000756	3.15	14.00	14.38	-0.38
P-313	MH-313	MH-314	36 inch	632.30	0.011	0.000933	2.99	15.56	13.64	1.92
P-314	MH-314	MH-315	36 inch	626.00	0.011	0.000543	2.96	11.87	13.52	-1.65
P-315	MH-315	MH-316	18 inch	600.00	0.011	0.001417	3.19	3.02	3.64	-0.62
P-316	MH-316	MH-317	18 inch	600.00	0.011	0.001350	3.19	2.95	3.64	-0.70
P-317	MH-317	MH-318	18 inch	600.00	0.011	0.001333	3.19	2.93	3.64	-0.71
P-318	MH-318	MH-319	18 inch	600.02	0.011	0.001350	2.36	2.95	2.70	0.25
P-319	MH-319	MH-320	18 inch	75.00	0.011	0.001333	2.36	2.93	2.70	0.23
P-320	MH-320	MH-321	18 inch	600.00	0.011	0.001350	2.36	2.95	2.70	0.25
P-321	MH-321	MH-322	18 inch	600.00	0.011	0.000783	2.29	2.25	2.61	-0.37
P-322	MH-322	MH-323	18 inch	322.00	0.011	0.001087	2.29	2.65	2.61	0.03
P-323	MH-323	MH-324	18 inch	470.00	0.011	0.001106	2.29	2.67	2.61	0.06
P-324	MH-324	MH-325A	18 inch	573.00	0.011	0.001152	2.29	2.72	2.61	0.11
P-325A	MH-325A	MH-325B	18 inch	397.00	0.011	0.001108	2.29	2.67	2.61	0.06
P-325B	MH-325B	MH-326	18 inch	203.00	0.011	0.001084	1.40	2.64	1.59	1.05
P-326	MH-326	MH-327	18 inch	600.00	0.011	0.001100	1.40	2.66	1.59	1.07
P-327	MH-327	MH-328	18 inch	600.00	0.011	0.001100	1.40	2.66	1.59	1.07
P-328	MH-328	MH-329	18 inch	572.32	0.011	0.001101	1.40	2.66	1.59	1.07
P-329	MH-329	MH-330	18 inch	531.00	0.011	0.001092	1.40	2.65	1.59	1.06
P-330	MH-330	MH-331	18 inch	531.00	0.011	0.001111	1.40	2.67	1.59	1.08
P-331	MH-331	MH-332	18 inch	531.00	0.011	0.001092	1.40	2.65	1.59	1.06
P-332	MH-332	MH-333	18 inch	535.52	0.011	0.001102	1.40	2.66	1.59	1.07
P-333	MH-333	MH-334	18 inch	497.32	0.011	0.001106	1.40	2.67	1.59	1.07
P-334	MH-334	MH-335	18 inch	475.08	0.011	0.001095	1.29	2.65	1.48	1.18
P-335	MH-335	MH-336	18 inch	466.92	0.011	0.001114	1.24	2.68	1.42	1.26
P-336	MH-336	MH-337	18 inch	468.00	0.011	0.001090	1.24	2.65	1.42	1.23
P-337	MH-337	MH-338	18 inch	469.28	0.011	0.001108	1.24	2.67	1.42	1.25
P-338	MH-338	MH-339	18 inch	460.51	0.011	0.001086	1.28	2.64	1.42	1.22
P-339	MH-339	MH-340	18 inch	500.00	0.011	0.001100	1.48	2.66	1.42	1.24
P-340	MH-340	MH-341	18 inch	501.41	0.011	0.001097	1.84	2.66	1.42	1.24
P-341	MH-341	MH-342	18 inch	600.00	0.011	0.001100	1.91	2.66	1.08	1.59
P-342	MH-342	MH-343	18 inch	600.00	0.011	0.001100	2.02	2.66	1.08	1.59
P-343	MH-343	MH-344	18 inch	600.00	0.011	0.001100	2.02	2.66	1.08	1.59
P-344	MH-344	MH-345	18 inch	500.00	0.011	0.001100	1.82	2.66	0.90	1.76
P-345	MH-345	MH-346	18 inch	507.17	0.011	0.001104	1.91	2.67	0.90	1.77
P-346	MH-346	MH-347	18 inch	600.00	0.011	0.001100	1.91	2.66	0.90	1.76
P-347	MH-347	MH-348	18 inch	600.00	0.011	0.001100	1.91	2.66	0.90	1.76
P-348	MH-348	MH-349	18 inch	638.67	0.011	0.001096	1.89	2.66	0.75	1.90
P-349	MH-349	MH-350	15 inch	408.00	0.011	0.003309	1.98	2.84	0.52	2.32
P-350	MH-350	MH-351	15 inch	409.92	0.011	0.002781	2.25	2.60	0.52	2.09

Scenario: BRIMHALL MOHAWK FUTURE LOADS (B)

CAPACITY REPORT

Label	Downstream Node	Upstream Node	Section Size	Length (ft)	Mannings n	Constructed Slope (ft/ft)	Average Velocity (ft/s)	Pipe Capacity (mgd)	Total Peak Flow (mgd)	Excess Capacity (mgd)
P-351	MH-351	MH-352	15 inch	312.62	0.011	0.002815	2.21	2.62	0.52	2.10
P-352	MH-352	MH-353	15 inch	187.11	0.011	0.002779	2.21	2.60	0.52	2.08
P-353	MH-353	MH-354	15 inch	230.00	0.011	0.002826	2.21	2.62	0.52	2.11
P-354	MH-354	MH-355	15 inch	62.61	0.011	0.002715	1.05	2.57	0.13	2.44
P-355	MH-355	MH-356	15 inch	475.96	0.011	0.002815	1.58	2.62	0.13	2.48
P-356	MH-356	MH-357	15 inch	25.00	0.011	0.006800	1.10	4.07	0.13	3.93
P-358	MH-325B	MH-358	15 inch	5,280.00	0.013	0.001500	1.27	1.62	0.55	1.07
P-359	MH-358	MH-359	12 inch	5,280.00	0.013	0.002000	1.40	1.03	0.23	0.80
P-360	MH-341	MH-360	12 inch	1,640.00	0.013	0.002012	1.23	1.03	0.22	0.81
P-361	MH-344	MH-361	15 inch	1,640.00	0.013	0.001524	1.07	1.63	0.18	1.45
P-362	MH-361	MH-362	12 inch	2,640.00	0.013	0.002008	1.87	1.03	0.18	0.85
P-363	MH-349	MH-363	18 inch	1,004.00	0.013	0.001096	0.90	2.25	0.24	2.01
P-364	MH-363	MH-364	15 inch	2,256.00	0.013	0.001507	1.70	1.62	0.20	1.42
P-365	MH-364	MH-365	12 inch	2,054.00	0.013	0.001996	1.69	1.03	0.14	0.89
P-366	MH-364	MH-366	12 inch	1,385.00	0.013	0.002022	0.99	1.04	0.06	0.97

APPENDIX B

Appendix B

Proposed Service Area Cost Details

Estimated Construction Costs.

- County Planned Sewer Area A
- County Planned Sewer Area B
- City Planned Sewer Area #1
- City Planned Sewer Area #2
- City Planned Sewer Area #3
- City Planned Sewer Area #4
- City Planned Sewer Area #5

Appendix B

Detailed Analysis of City Planned Service Area #1 Costs and Offsets

	03/30/02 ESFD 8,685		03/18/04 ESFD 9,481		02/18/04 Total Costs
Project Cost per ESFD [1]	$1,112.00		$1,136.03		$10,770,685.00
Extra Capacity Cost Per ESFD [2]	76.00 [3]		61.96 [4]		587,398.37
Allen Road Trunkline Cost/ESFD	230.00		210.95		2,000,000.00
Allen Road from Palm Ave. to Rosedale Hwy.			57.30		543,260.00
Brimhall Road Sewer Contribution			9.83		93,196.62
Subtotal County Line Fee		$1,418.00		$1,476.06	
Buena Vista Trunk II	$387.00		$426.18		
Brimhall	-		N/A		
Stockdale Trunk	51.00		N/A		
Allen Road Trunkline	-		N/A		
City Connection Fee	2,200.00		2,400.00		
Subtotal City Connection/Capacity Charge		$2,638.00		$2,826.18	
		$4,056.00		$4,302.24	

Notes:

[1] Fee detramined by taking the project cost and dividing by number of ESFD.

[2] This came from Exhibit G of County Agreement No. 943-99 MGC Formula. That formula calculates $574,506 per MGD peak flow, or 57.45 cents/peak flow gallon per day.

[3] Prior Service Area No. 1 Report Within the boundary of Service Area No. 1 there were 8,685 ESFD's total. Since 6,528 units were already covered by the $2,000,000 contribution by Kern County (Ref. Agreement No. 943-99), the remaining units needed to be covered by formula. The units not accounted by formula totaled 2,157. The cost associated with those units, based on the formula was $660,682. Taking that cost and dividing by 8,685 total units returned the $76 per unit.

[4] Revised Service Area No. 1 Service Area No. 1 has expanded to 9,455 units. The County paid $543,260 for the Allen Road sewer extension from Palm Avenue to Rosedale Highway. This amount was subtracted from the construction cost budget and accounted for separately. The County contributed $93,196.62 to the City for the Brimhall trunk from Westdale to Allen Road. This was added to the $2,000,000 contribution by the County to the City for a Total of $2,093,196.62. Applying the formula from Exhibit G of Kern County Agreement 943-99, the total cost for the 9,455 units is $2,680,594.99. Subtracting from that number the $2,093,196.62 of Kern County contributions results in $587,398.37 of Extra Capacity cost. Dividing that number by the total number of ESFD's results in an extra capacity cost of $62 per unit.

APPENDIX B

Appendix B

Proposed Service Area Cost Details

Estimated Construction Costs.

- County Planned Sewer Area A
- County Planned Sewer Area B
- City Planned Sewer Area #1
- City Planned Sewer Area #2
- City Planned Sewer Area #3
- City Planned Sewer Area #4
- City Planned Sewer Area #5

CSA 71
Proposed NORSD Trunk Sewer / County Planned Sewer Area A
Preliminary Opinion of Probable Construction Cost
Project No.: 02621
Date: November 2003

Item No.	Estimated Quantity	Unit of Measure	Item	Unit Price	Extension
1	1	L.S.	Mobilization(10%)	2,229,756	2,229,756
2	1	L.S.	Trench Safety	100,000	100,000
3	1	L.S.	Traffic Control	100,000	100,000
4	1	L.S.	Develop Water	10,000	10,000
5	436	Ea.	Manholes	4,500	1,960,200
6	100,320	L.F.	12" PVC Trunk Line	60	6,019,200
7	36,960	L.F.	15" PVC Trunk Line	75	2,772,000
8	21,120	L.F.	18" PVC Trunk Line	90	1,900,800
9	5,280	L.F.	21" PVC Trunk Line	100	528,000
10	5,280	L.F.	24" PVC Trunk Line	110	580,800
11	2,640	L.F.	27" PVC Trunk Line	120	316,800
12	2,640	L.F.	30" PVC Trunk Line	130	343,200
13	348,480	L.F.	Sawcut Pavement	2	696,960
14	174,240	L.F.	Pavement Repair	40	6,969,600
Subtotal					24,527,316
Contingency (15%)					3,679,097
Subtotal					28,206,413
Engineering, Surveying, Construction Inspection (15%)					4,230,962
Total					32,437,375

CSA 71
Proposed NORSD Trunk Sewer / County Planned Sewer Area B
Preliminary Opinion of Probable Construction Cost
Project No.: 02621
Date: November 2003

Item No.	Estimated Quantity	Unit of Measure	Item	Unit Price	Extension
1	1	L.S.	Mobilization(10%)	1,883,592	1,883,592
2	1	L.S.	Trench Safety	100,000	100,000
3	1	L.S.	Traffic Control	100,000	100,000
4	1	L.S.	Develop Water	10,000	10,000
5	343	Ea.	Manholes	4,500	1,544,400
6	5,280	L.F.	10" PVC Trunk Line	55	290,400
7	76,560	L.F.	12" PVC Trunk Line	60	4,593,600
8	23,760	L.F.	15" PVC Trunk Line	75	1,782,000
9	13,200	L.F.	18" PVC Trunk Line	90	1,188,000
10	10,560	L.F.	21" PVC Trunk Line	100	1,056,000
11	7,920	L.F.	24" PVC Trunk Line	110	871,200
12	274,560	L.F.	Sawcut Pavement	2	549,120
13	137,280	L.F.	Pavement Restoration	40	5,491,200
14	3	L.S.	SS Lift Pump Station	400,000	1,200,000
15	3	L.S.	Real Estate Procurement	20,000	60,000
Subtotal					20,719,512
Contingency (15%)					3,107,927
Subtotal					23,827,439
Engineering, Surveying, Construction Inspection (15%)					3,574,116
Total					27,401,555

CSA 71
Proposed Allen Road Sewer / City Service Area # 1
Preliminary Opinion of Probable Construction Cost
Project No.: 02621
Date: February 2004

Item No.	Estimated Quantity	Unit of Measure	Item	Unit Price	Extension
1	1	L.S.	Mobilization(10%)	740,381	740,381
2	1	L.S.	Trench Safety	50,000	50,000
3	1	L.S.	Traffic Control	50,000	50,000
4	1	L.S.	Develop Water	10,000	10,000
5	99	Ea.	Manholes	4,500	446,925
6	20,060	L.F.	10" PVC Trunk Line	55	1,103,300
7	6,880	L.F.	12" PVC Trunk Line	60	412,800
8	12,580	L.F.	15" PVC Trunk Line	75	943,500
9	6,600	L.F.	18" PVC Trunk Line	90	594,000
10	120	L.F.	22" Bore and Casing at Hagman Road for 15" PVC Line	220	26,400
11	120	L.F.	22" Bore and Casing at Rosedale Hwy. for 15" PVC Line	220	26,400
12	120	L.F.	26" Bore and Casing at Rosedale Hwy. for 18" PVC Line	260	31,200
13	92,240	L.F.	Sawcut Pavement	2	184,480
14	46,120	L.F.	Pavement Restoration	40	1,844,800
15	4	L.S.	SS Lift Pump Station	400,000	1,600,000
16	4	L.S.	Real Estate Procurement	20,000	80,000
Subtotal					8,144,186
Contingency (15%)					1,221,628
Subtotal					9,365,813
Engineering, Surveying, Construction Inspection (15%)					1,404,872
Total					10,770,685

Appendix B

Detailed Analysis of City Planned Service Area #1 Costs and Offsets

	03/30/02 ESFD 8,685		03/18/04 ESFD 9,481		02/18/04 Total Costs
Project Cost per ESFD [1]	$1,112.00		$1,136.03		$10,770,685.00
Extra Capacity Cost Per ESFD [2]	76.00 [3]		61.96 [4]		587,398.37
Allen Road Trunkline Cost/ESFD	230.00		210.95		2,000,000.00
Allen Road from Palm Ave. to Rosedale Hwy.			57.30		543,260.00
Brimhall Road Sewer Contribution			9.83		93,196.62
Subtotal County Line Fee		$1,418.00		$1,476.06	
Buena Vista Trunk II	$387.00		$426.18		
Brimhall	-		N/A		
Stockdale Trunk	51.00		N/A		
Allen Road Trunkline	-		N/A		
City Connection Fee	2,200.00		2,400.00		
Subtotal City Connection/Capacity Charge		$2,638.00		$2,826.18	
		$4,056.00		$4,302.24	

Notes:

(1) Fee detramined by taking the project cost and dividing by number of ESFD.

(2) This came from Exhibit G of County Agreement No. 943-99 MGC Formula. That formula calculates $574,506 per MGD peak flow, or 57.45 cents/peak flow gallon per day.

(3) Prior Service Area No. 1 Report Within the boundary of Service Area No. 1 there were 8,685 ESFD's total. Since 6,528 units were already covered by the $2,000,000 contribution by Kern County (Ref. Agreement No. 943-99), the remaining units needed to be covered by formula. The units not accounted by formula totaled 2,157. The cost associated with those units, based on the formula was $660,682. Taking that cost and dividing by 8,685 total units returned the $76 per unit.

(4) Revised Service Area No. 1 Service Area No. 1 has expanded to 9,455 units. The County paid $543,260 for the Allen Road sewer extension from Palm Avenue to Rosedale Highway. This amount was subtracted from the construction cost budget and accounted for separately. The County contributed $93,196.62 to the City for the Brimhall trunk from Westdale to Allen Road. This was added to the $2,000,000 contribution by the County to the City for a Total of $2,093,196.62. Applying the formula from Exhibit G of Kern County Agreement 943-99, the total cost for the 9,455 units is $2,680,594.99. Subtracting from that number the $2,093,196.62 of Kern County contributions results in $587,398.37 of Extra Capacity cost. Dividing that number by the total number of ESFD's results in an extra capacity cost of $62 per unit.

CSA 71
Proposed Stockdale - Nord Trunk Sewer / City Planned Sewer Area # 2
Preliminary Opinion of Probable Construction Cost
Project No.: 02621
Date: November 2003

Item No.	Estimated Quantity	Unit of Measure	Item	Unit Price	Extension
1	1	L.S.	Mobilization(10%)	837,975	837,975
2	1	L.S.	Trench Safety	50,000	50,000
3	1	L.S.	Traffic Control	100,000	100,000
4	1	L.S.	Develop Water	10,000	10,000
5	109	Ea.	Manholes	4,500	491,250
6	18,900	L.F.	10" PVC Trunk Line	55	1,039,500
7	15,900	L.F.	12" PVC Trunk Line	60	954,000
8	8,000	L.F.	18" PVC Trunk Line	90	720,000
9	5,300	L.F.	24" PVC Trunk Line (Proposed by COB / Const. 04-05)	110	583,000
10	10,600	L.F.	8" and 10" PVC Force Main	90	954,000
11	120	L.F.	20" Bore and Casing at Rosedale Hwy. For 12" PVC Line	200	24,000
12	120	L.F.	26" Bore and Casing at Stockdale Hwy. For 18" PVC Line	260	31,200
13	117,400	L.F.	Sawcut Pavement	2	234,800
14	58,700	L.F.	Pavement Restoration	40	2,348,000
15	2	L.S.	SS Lift Pump Station	400,000	800,000
16	2	L.S.	Real Estate Procurement	20,000	40,000
Subtotal					9,217,725
Contingency (15%)					1,382,659
Subtotal					10,600,384
Engineering, Surveying, Construction Inspection (15%)					1,590,058
Total					12,190,441

CSA 71
Proposed El Viejo Trunk Sewer / City Planned Sewer Area # 3
Preliminary Opinion of Probable Construction Cost
Project No.: 02621
Date: November 2003

Item No.	Estimated Quantity	Unit of Measure	Item	Unit Price	Extension
1	1	L.S.	Mobilization(10%)	117,488	117,488
2	1	L.S.	Trench Safety	50,000	50,000
3	1	L.S.	Traffic Control	50,000	50,000
4	1	L.S.	Develop Water	5,000	5,000
5	24	Ea.	Manholes	4,500	106,875
6	5,000	L.F.	10" PVC Trunk Line	55	275,000
7	4,500	L.F.	12" PVC Trunk Line	60	270,000
8	19,000	L.F.	Sawcut Pavement	2	38,000
9	9,500	L.F.	Pavement Restoration	40	380,000
Subtotal					1,292,363
Contingency (15%)					193,854
Subtotal					1,486,217
Engineering, Surveying, Construction Inspection (15%)					222,933
Total					1,709,149

CSA 71
Proposed Buena Vista Trunk Sewer / City Service Area # 4
Preliminary Opinion of Probable Construction Cost
Project No.: 02621
Date: February 2004

Item No.	Estimated Quantity	Unit of Measure	Item	Unit Price	Extension
1	1	L.S.	Mobilization(10%)	230,848	230,848
2	1	L.S.	Trench Safety	50,000	50,000
3	1	L.S.	Traffic Control	50,000	50,000
4	1	L.S.	Develop Water	10,000	10,000
5	39	Ea.	Manholes	4,500	174,375
6	10,220	L.F.	10" PVC Trunk Line	55	562,100
7	5,280	L.F.	12" PVC Trunk Line	60	316,800
8	120	L.F.	18" Bore and Casing at Railroad for 10" PVC Line	180	21,600
9	120	L.F.	18" Bore and Casing at Rosedale Hwy. for 10" PVC Line	180	21,600
10	31,000	L.F.	Sawcut Pavement	2	62,000
11	15,500	L.F.	Pavement Restoration	40	620,000
12	1	L.S.	SS Lift Pump Station	400,000	400,000
13	1	L.S.	Real Estate Procurement	20,000	20,000
Subtotal					2,539,323
Contingency (15%)					380,898
Subtotal					2,920,221
Engineering, Surveying, Construction Inspection (15%)					438,033
Total					3,358,254

CSA 71
Proposed Brimhall - Mohawk Trunk Sewer / City Planned Sewer Area # 5
Preliminary Opinion of Probable Construction Cost
Project No.: 02621
Date: November 2003

Item No.	Estimated Quantity	Unit of Measure	Item	Unit Price	Extension
1	1	L.S.	Mobilization(10%)	289,818	289,818
2	1	L.S.	Trench Safety	50,000	50,000
3	1	L.S.	Traffic Control	50,000	50,000
4	1	L.S.	Develop Water	10,000	10,000
5	40	Ea.	Manholes	4,500	180,375
6	6,700	L.F.	12" PVC Trunk Line	60	402,000
7	6,600	L.F.	15" PVC Trunk Line	75	495,000
8	7,400	L.F.	18" PVC Trunk Line	90	666,000
9	120	L.F.	20" Bore and Casing at Rosedale Hwy. for 12" PVC Line	200	24,000
10	240	L.F.	22" Bore and Casing at Rosedale Hwy. for 2X15" PVC Line	220	52,800
11	120	L.F.	26" Bore and Casing at Rosedale Hwy. for 18" PVC Line	260	31,200
12	100	L.F.	26" Bore and Casing at RR for 18" PVC Line	260	26,000
13	41,400	L.F.	Sawcut Pavement	2	82,800
14	20,700	L.F.	Pavement Restoration	40	828,000
Subtotal					3,187,993
Contingency (15%)					478,199
Subtotal					3,666,191
Engineering, Surveying, Construction Inspection (15%)					549,929
Total					4,216,120

APPENDIX C

Appendix C

CSA-71 Agreements

February 6, 1990
April 23, 1991
April 7, 1992
January 26, 1993
October 20, 1999
January 12, 2000

Kern County
Agt. # 071-90

JOINT EXERCISE OF POWERS AGREEMENT

BETWEEN

NORTH OF RIVER SANITARY DISTRICT NO. 1,

COUNTY OF KERN,

AND

CITY OF SHAFTER

PARTIES AND DATE

This Agreement is made this 6th day of February, 1990 between the CITY OF SHAFTER, a municipal corporation (hereinafter referred to as "SHAFTER"), the NORTH OF RIVER SANITARY DISTRICT NO. 1, a special district of the State of California (hereinafter referred to as "NORSD"), and the County of Kern, a political subdivision of the State of California (hereinafter referred to as "COUNTY").

R E C I T A L S

WHEREAS, SHAFTER, NORSD, and COUNTY, are empowered to acquire, construct, operate and maintain sewerage systems that include, but are not limited to, sewer lines, sewage lift stations, wastewater treatment plants and treated wastewater effluent disposal areas; and

THEREFORE, NORSD, COUNTY, and SHAFTER have determined that it is in their best interest to enter into this JPA to plan, design, construct, operate and maintain sewerage improvements to meet sewer needs of all of the parties to this JPA.

SECTION 1: PROJECT FACILITIES:

The sewerage facilities, hereinafter referred to as "Project facility (ies)", covered by this JPA include trunk sewers, a wastewater treatment plant, and treated wastewater disposal facilities. The approximate alignments of the trunk sewers and the locations of the wastewater treatment plant and disposal areas are shown on Exhibit "A" attached hereto. The alignments and locations shown are preliminary and subject to change.

NORRIS/SEVENTH STANDARD SEWER:

The NORRIS/SEVENTH STANDARD SEWER will extend from NORSD's present wastewater treatment plant to the site of the wastewater treatment plant proposed herein. That portion of the NORRIS/SEVENTH STANDARD SEWER located west of Jenkins Road is part of the project facilities.

SHAFTER SEWER:

payment, plus the amount of interest that that money would have earned if it had been invested by the Kern County Treasurer. Upon such request, NORSD shall remit the amount requested to COUNTY.

If the first phase of the wastewater treatment plant is not constructed and operational by January 1, 2000, SHAFTER may request that NORSD return the amount of money which SHAFTER paid, for the construction of the NORRIS/SEVENTH STANDARD SEWER pursuant to this JPA, plus the amount of interest that that money would have earned if it had been invested by the Kern County Treasurer. Upon such request, NORSD shall remit the amount requested to SHAFTER.

SECTION 3: CAPACITY RIGHTS:

NORRIS/SEVENTH STANDARD SEWER:

Except as noted below, ownership of the NORRIS/SEVENTH STANDARD SEWER shall be vested solely in NORSD. Both SHAFTER and COUNTY shall have capacity rights in the NORRIS/SEVENTH STANDARD SEWER in the amounts indicated below. Those capacity rights are based on the total costs to be paid by SHAFTER and COUNTY for each "reach" of the NORRIS /SEVENTH STANDARD SEWER.

A "reach" is an identifiable portion of the sewer.

The SHAFTER SEWER shall be owned solely by Shafter. The entire capacity of this sewer shall likewise be owned solely by Shafter.

WASTEWATER TREATMENT PLANT AND DISPOSAL FACILITIES:

The wastewater treatment plant and disposal facilities will be jointly owned by NORSD and Shafter. Ownership, and capacity in the facilities, shall be vested in NORSD and Shafter in direct proportion to the fraction of the total cost of the treatment and disposal facilities paid for by each. "Total Cost" shall include all costs associated with the wastewater treatment plant and disposal facilities, including, but not limited to, construction contract costs (including change orders), right-of-way costs, land costs, legal costs, administrative costs, financing costs (including interest), insurance costs and engineering costs. Capacity rights owned by NORSD and SHAFTER shall be based on the total actual capacity of the wastewater treatment plant and disposal facilities. As between NORSD and SHAFTER, the capacity rights for the wastewater treatment plant and disposal facilities which are used by or reserved for COUNTY shall be considered as being included in the ownership and capacity rights vested in NORSD.

COUNTY shall be permitted to use wastewater treatment plant capacity upon payment of a Connection Fee as each sewer user in CSA 71 is connected to the public sewer herein described. The connection fees

It is probable that at sometime in the future one or more of the parties to this JPA may find that it (they) have excess capacity in the sewer, treatment plant, or disposal facility. In such an event, the party with the excess capacity may transfer its excess capacity, or capacities, to one of the other parties to this JPA provided the other party agrees to accept the transfer. Such transfer may be permanent or for a limited period of time.

SECTION 4: CONSTRUCTION OF WASTEWATER TREATMENT PLANT AND DISPOSAL FACILITIES:

NORSD or Shafter may construct or expand treatment plant and disposal facilities as they determine are necessary to meet their needs. Either party can expand the treatment plant and/or disposal facilities at no cost to the other. It is the intent of this JPA that any such construction be a cooperative, joint effort of NORSD and SHAFTER. However, it may occur that only one of the parties desires to construct or expand the facilities. In such a case, the non-participating party shall cooperate with the party proposing the construction. Construction of improvements shall be done in such a manner so as not to interfere with the safe and continuous operation of any existing facilities.

SECTION 5: TECHNICAL ADVISORY COMMITTEE:

$2,500,000 for constructing the sewer. NORSD has on hand a like or greater sum to fund construction of the sewer. Shafter's share of the sewer is estimated to be $1,000,000. The remainder of NORSD's share required for construction of the sewer will be obtained by debt financing. NORSD will arrange for said debt financing used to implement the construction of the NORRIS/SEVENTH STANDARD SEWER. Within 30 days of the date of execution of this Agreement, COUNTY shall contribute $2,500,000 to NORSD as an initial payment toward CSA 71's share of the total cost of that portion of the sewer in which CSA 71 has capacity rights. If NORSD fails to obtain sufficient financing within three (3) years following the execution of the JPA to construct the NORRIS/Seventh STANDARD SEWER, NORSD shall upon the request of the County return the $2,500,000 initial payment to COUNTY plus the amount of interest the $2,500,000 would have earned if it had been invested by the Kern County Treasurer.

After the commencement of the construction of the NORRIS/SEVENTH STANDARD SEWER, COUNTY shall pay NORSD COUNTY'S share of the total costs of the sewer as allocated pursuant to Section 3 of this JPA less the sum of the $2,500,000 initial payment plus the amount of interest the $2,500,000 would have earned if it had been invested by the Kern County Treasurer. COUNTY shall pay this difference over a period of time, not to exceed ten (10) years, as provided below for "advanced fund". COUNTY, in its sole discretion, can at any time prepay the amount due without penalty.

present site will be finally totally disposed of after the proposed wastewater treatment plant and disposal facilities specified herein become available to treat and dispose NORSD's wastewater flows.

The cost of abandonment of NORSD's present facilities, or any expense related to the NORSD's presently owned property, shall be borne solely by NORSD. Any income or revenue from the sale of NORSD's property shall be considered solely the income or revenue of NORSD although such income or revenue may be used, at the sole discretion of NORSD, to fund construction of the project facilities described herein.

If funds from one party to this JPA are used to fund the construction or operation and maintenance of facilities that benefit one or both of the other parties to this agreement, then such "advanced funds" shall be repaid by the benefiting party, or parties, to the party advancing the "advanced funds". The total repaid shall include the cost of the funds borrowed or otherwise advanced.

When funds are advanced from cash on hand, the amount repaid shall be equal to the principal sum advanced plus the interest that would have been earned had the funds been allowed to accumulate in an interest bearing account. The interest rates that would have been earned had the funds been invested with the Kern County Treasurer will be used to calculate the amount of interest due the advancing party.

NORSD shall have the authority and the right to meet budgeted O&M expenses without further approval or concurrence by COUNTY or SHAFTER. NORSD agrees to abide by financial policies and procedures generally applicable to sanitary districts of similar size and operation.

For purposes of this agreement, "Year" shall be defined as a fiscal year beginning on the 1st day of July.

In the event of an emergency requiring immediate action to rectify a condition endangering the public health and safety, or damage to the project facilities, NORSD may incur unbudgeted expenses on behalf of the three parties to this JPA. In the event of such an emergency, reasonable effort will be made to obtain the approval of the TAC committee members prior to taking action. NORSD's spending authority in an emergency shall be limited to $25,000 per incident unless approved otherwise by the participants' governing bodies, except where the Health and Safety Code or Government Code of the State of California allow or require some other limit.

Quarterly, at the start of each quarter of each fiscal year, NORSD shall present a billing to each Party for one-fourth (1/4) of each respective Party's share of the annual budget. Said billing may be paid monthly, due the 1st of each month. Upon receipt of the audit for a given fiscal year, NORSD shall reconcile payments made as

proximately caused in whole or in part by any negligence of COUNTY or its agents, officers, directors, servants or employees, and each of them, in connection with the rights and duties granted in this agreement to COUNTY or in connection with operation and or maintenance of COUNTY's separate sewerage systems.

SHAFTER agrees to indemnify and to hold COUNTY and NORSD and their agents, officers, directors, servants, employees and each of them, harmless from and against all liability or claims for loss or damage to property to whomever belonging or injury to or death of any person proximately caused in whole or in part by any negligence of SHAFTER or its agents, officers, directors, servants or employees, and each of them, in connection with the rights and duties granted in this agreement to SHAFTER or in connection with operation and or maintenance of SHAFTER's separate sewerage systems.

NORSD shall maintain sufficient insurance against loss or damage to the project facilities as is customarily maintained with respect to such facilities in the State of California. In addition, NORSD shall maintain sufficient workers' compensation and public liability insurance as is customarily maintained with respect to such facilities in the State of California. Said public liability insurance shall name COUNTY and SHAFTER and their respective officers, officials and employees as additional named insureds and shall insure NORSD for its contractual obligations under this JPA.

the entities (NORSD, COUNTY, or SHAFTER) that will own capacity in the new facility. The calculation will be based on the fraction of the calendar year the new facility will be in operation and the estimated "fixed costs" for that fraction of the fiscal year the new facility will be in operation.

Fixed costs shall be allocated to each party based on their capacity rights in each of the facilities.

With respect to the fixed costs for the NORRIS/SEVENTH STANDARD SEWER which are not specifically related to a particular "reach" (e.g. liability and property insurance and cost of annual audits), such fixed costs shall be allocated to each "reach" identified in Section 3 of this JPA based on the length of each "reach". The parties will bear the fixed costs for each "reach" based on the allocated capacity rights defined in Section 3 of this JPA.

VARIABLE COSTS - Variable costs are those directly related to flow including, but not limited to:

1. Power for operations (variable component)
2. Chemicals
3. Labor

of CSA 71 flow for use by the TAC to calculate flow distribution.

It is the intent of the parties that the O&M costs be allocated based on the actual flows generated by the respective parties.

The total O&M cost to be paid by each party to this JPA shall be the sum of the fixed and variable O&M costs.

SECTION 9 - FINANCIAL ACCOUNTING

NORSD, as the "operating entity" (refer to Section 7), shall establish separate accounts for capital and O&M costs associated with the project facilities. The accounts and procedures followed in administering the accounts shall conform to the recommendations of the State of California's UNIFORM SYSTEM OF ACCOUNTS FOR WASTE DISPOSAL DISTRICTS.

Within six months after the end of NORSD's fiscal year, the financial accounts referred to in the preceding paragraph shall be audited by an accounting firm independent of and acceptable to each of the three parties to this JPA. The audit shall establish whether or not expenses and revenues have been properly allocated to each party and shall cover both capital expenditures, if any, and O&M costs. The

the ORDINANCE, the conditions within the ORDINANCE shall be applied to all dischargers whose wastewater flows into the project facilities. The ORDINANCE shall establish acceptable discharge standards and appropriate surcharges for the commercial/industrial users and any other items as are customarily included in such ordinances.

After adoption, the ORDINANCE may only be modified with unanimous consent of the parties to this JPA.

SECTION 12 - NON-PROJECT FACILITIES

NORSD, COUNTY, and SHAFTER shall each separately operate and maintain their sewerage facilities which connect to but are not a part of the PROJECT FACILITIES. However, this requirement shall not prevent by separate agreement one or more of the parties to this JPA from contracting for maintenance and operation of their separate facilities.

SECTION 13 - LIQUIDATION, EXPANSION, AND REPLACEMENT OF PROJECT FACILITIES:

If any portion of the PROJECT FACILITIES is sold, the revenues from such sale shall be distributed to the parties to this JPA in proportion to each Party's share of the capacity of the facility

Depreciation of fixed assets is a recognized and legitimate O&M expense and shall be included in the preparation of the annual O&M budget. However, because of the varying requirements of the Parties, depreciation and any construction reserve fund shall be the responsibility of each individual Party and not of the JPA.

SECTION 15 - SETTLEMENT OF DISAGREEMENTS:

Any disagreements resulting from this agreement shall be submitted to nonbinding advisory arbitration pursuant to the rules of the American Arbitration Association.

SECTION 16 - SEVERABILITY:

If any section, subsection, sentence, clause, phrase or word of this agreement, or the application thereof, to any party, or to any other person or circumstance, is for any reason held invalid, it shall be deemed severable and the validity of the remainder of the agreement or the application of such provision to the other party, parties, or to any other persons or circumstance shall not be affected thereby. Each Party hereby declares that it would have entered into this agreement and each section, subsection, sentence, clause, phrase and work thereof irrespective of the fact that one or more section, subsection, sentence, clause, phrase or word, or the application

NORSD: 5001 Olive Dr.
Bakersfield
93308

SHAFTER: 320 James
Shafter
93263

COUNTY: 2700 M Suit 500
Bakersfield
93301

SECTION 19 - ATTORNEYS FEES AND COSTS:

IF any action at law or in equity is necessary to enforce or interpret the terms of this agreement, or if the arbitration provisions of this agreement noted above are invoked, the prevailing party shall be entitled to reasonable attorneys fees, costs, and necessary disbursements in addition to any other relief to which that party may be entitled. This provision shall be construed as applicable to this entire agreement.

SECTION 20 - PARTIAL INVALIDITY:

If any provision of this agreement is held by a court of competent jurisdiction or by an arbitrator to be invalid, void, or unenforceable, the remaining provisions shall nevertheless continue in full force without being impaired or invalidated in any way. This agreement shall be interpreted according to the laws of the State of California.

IN WITNESS THEREOF, the parties to this JPA have executed this agreement on _____, 1990.

NORTH OF RIVER SANITARY DISTRICT:

APPROVED AS TO FORM:

By_____

District's Attorney

APPROVED AS TO CONTENT:

By Donald O. Sloan

General Manager

By_____

President

Kern County
Agt. #187-91

CITY OF BAKERSFIELD
Agreement No. 91-67
April 10, 1991

AMENDMENT TO AGREEMENT
FOR SEWER MAINTENANCE AND SEWAGE TRANSPORT,
TREATMENT AND DISPOSAL
A PORTION OF COUNTY SERVICE AREA NO. 71

THIS AMENDMENT TO AGREEMENT, made this 23rd day of April, 1991, by and between the COUNTY OF KERN, a political subdivision of the State of California (hereinafter "COUNTY") and the CITY OF BAKERSFIELD, a municipal corporation (hereinafter "CITY").

W I T N E S S E T H:

WHEREAS, COUNTY and CITY entered into County Agreement #480-89, City Agreement #89-197, dated August 30, 1989 (Exhibit "A") concerning sewage transport, treatment and disposal; and

WHEREAS, in said agreement CITY has agreed to construct, or cause to be constructed, those trunk sewers found necessary by CITY to connect portions of sewerage systems located in CITY SERVICE AREA to trunk sewer lines of CITY and shall maintain and operate those connecting trunk sewers; and

WHEREAS, per said agreement CSA 71 CAPITAL IMPROVEMENT ACCOUNT funds shall be apportioned to completed trunk sewers; and

WHEREAS, certain trunk sewers will be constructed utilizing assessment district financing; and

WHEREAS, significant costs associated with bond financing can be avoided if CSA 71 funds are applied at time of assessment district formation rather than at completion of construction; and

WHEREAS, COUNTY and CITY believe it would be more cost effective to apply CSA 71 funds towards its share of costs at time of assessment district formation; and

WHEREAS, COUNTY and CITY desire to modify said agreement to allow allocation of CSA 71 funds at the time assessment districts are formed to construct sewer trunk lines which will serve CSA 71.

NOW, THEREFORE, COUNTY and CITY do hereby mutually agree as follows:

1. Paragraph 6 of County Agreement #480-89, City Agreement #89-197, is revised as follows:

> CITY and COUNTY shall jointly, and to the satisfaction of each, determine the percentage of CITY SERVICE AREA to be served by each of the trunk sewers indicated on the drawing attached hereto, and marked as Exhibit "A". Thereupon, the $1,500,000

CITY OF BAKERSFIELD

transferred to CAPITAL IMPROVEMENT ACCOUNT shall be apportioned between the trunk sewers in accordance with the percentage of CITY SERVICE AREA to be served. Upon completion of construction of one or more of the trunk sewers, the funds apportioned to the completed sewer, along with interest accrued on that portion of the funds, shall be used to defray the cost of constructing the applicable trunk sewer with the intent to reduce assessments to be charged to properties within CITY SERVICE AREA for connection to that sewer or its tributary sewers. At the time an assessment district is to be formed to construct trunk sewers to serve CITY SERVICE AREA of County Service Area No. 71, CSA 71 CAPITAL IMPROVEMENT ACCOUNT funds may be applied to the project prior to the completion of construction at COUNTY's discretion.

2. All the remaining terms and conditions set forth in the County Agreement #480-89, City Agreement #89-197, of August 30, 1989, are continued hereafter in full force and effect, and all parties agree to continue performance in accordance with all terms of the agreement as amended.

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///

IN WITNESS WHEREOF, CITY and COUNTY have caused this Amendment to be executed by their respective authorized offices, to be effective on the date first above written.

APPROVED AS TO FORM:

By Robert M Sparks
City Attorney

Countersigned

By
Finance Director

CITY OF BAKERSFIELD

By Clarence E Medders
Mayor

"CITY"

APPROVED AS TO CONTENT:
Public Works Department

By
Director, Ed Schulz

APPROVED AS TO FORM:
Office of County Counsel

By
Deputy

COUNTY OF KERN

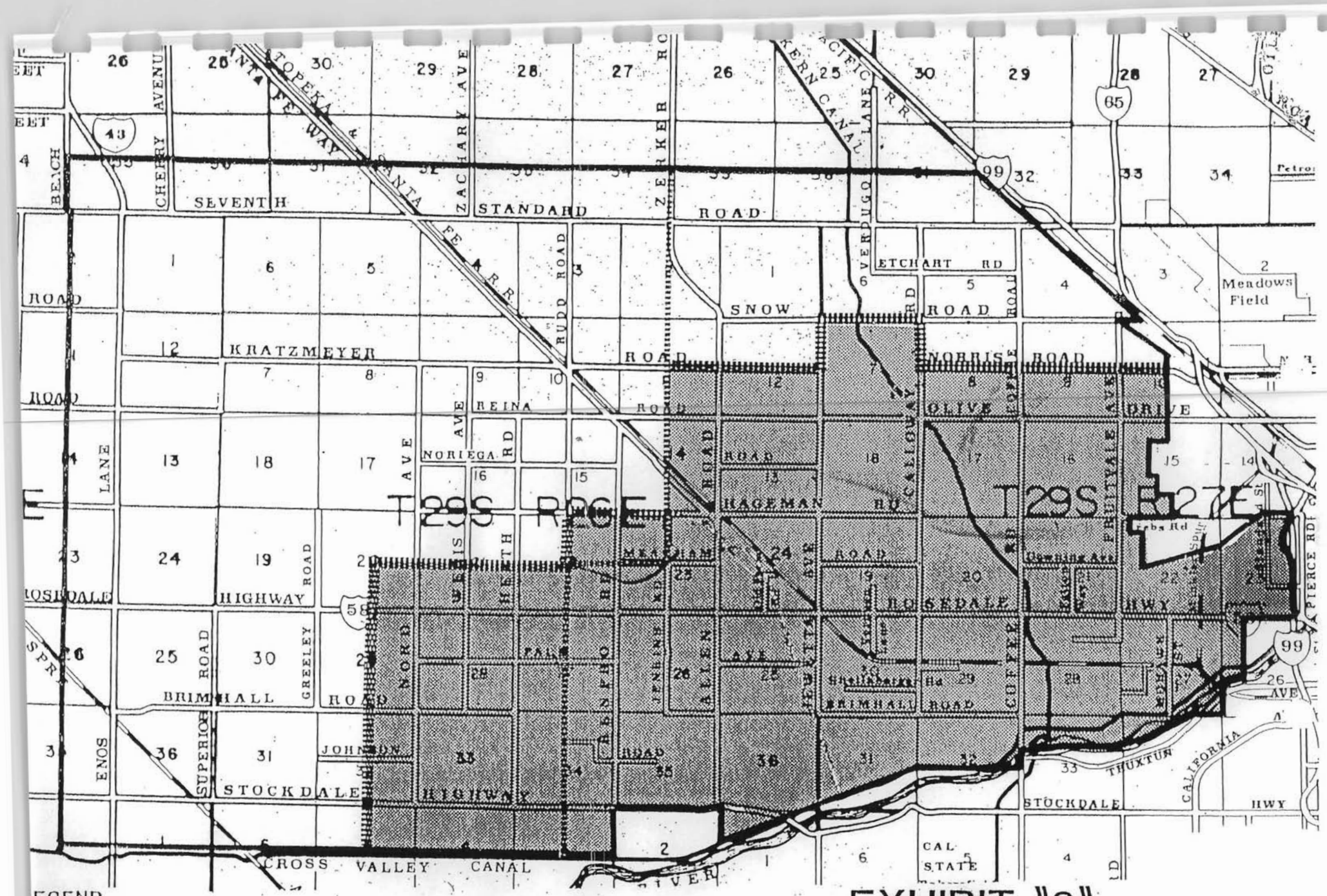
By Karl F Hettinger
Chairman, Board of Supervisors

"COUNTY"

APPROVED AS TO CONTENT
Department of Public Works

By
Director, L. Dale Mills

JB:cf
CSA71AG.A10



LEGEND

AMENDED CITY SERVICE AREA BOUNDARY

ORIGINAL CSA 71 BOUNDARY

EXHIBIT "2"

CITY OF BAKERSFIELD

CSA 71 SEWER AGREEMENT

AMENDED CITY SERVICE AREA BOUNDARY

Kern County
Agt. #109-92

CITY OF BAKERSFIELD
Agreement No. 93-14
Approved JUL 28 1993

AMENDMENT TO AGREEMENT
FOR SEWER MAINTENANCE AND SEWAGE TRANSPORT,
TREATMENT AND DISPOSAL
A PORTION OF COUNTY SERVICE AREA NO. 71

THIS AMENDMENT TO AGREEMENT, made this 7th day of April, 1992, by and between the COUNTY OF KERN, a political subdivision of the State of California (hereinafter "COUNTY") and the CITY OF BAKERSFIELD, a municipal corporation (hereinafter "CITY").

W I T N E S S E T H:

WHEREAS, COUNTY and CITY entered into County Agreement #480-89, City Agreement #89-197, dated August 30, 1989 (Exhibit "1") concerning sewage transport, treatment and disposal; and

WHEREAS, COUNTY and CITY amended said agreement on April 23, 1991, to permit release of CSA No. 71 funds upon formation of an assessment district for construction of a trunk line; and

WHEREAS, in said agreement COUNTY and CITY designated the CITY SERVICE AREA whereby the CITY shall be responsible for providing sewerage service to a portion of County Service Area No. 71 and the COUNTY, through a separate agreement with the North of the River Sanitation District, will provide service to the remainder of the territory; and

WHEREAS, due to the completion of the North of the River Sanitation District sewer trunk line, residents of the northern portion of the CITY SERVICE AREA can be more effectively served by the COUNTY; and

WHEREAS, due to the pattern of residential development, residents of the southern portion of CSA No. 71 not originally designated to be served by the CITY may now be more effectively served by the new sewage treatment plant planned by the CITY.

NOW, THEREFORE, COUNTY and CITY do hereby mutually agree to alter the boundaries of the CITY SERVICE AREA, by revising Exhibit "A" to Agreement #480-89 (Exhibit "1" hereof), to appear as shown on Exhibit "2" hereof; and

COUNTY and CITY further agree that all terms and conditions set forth in the County Agreement #480-89, City Agreement #89-197 of August 30, 1989, as amended April 23, 1991, are continued hereafter in full force and effect, and all parties agree to continue performance in accordance with all terms of the agreement as amended.

OF BAKERSF

IN WITNESS WHEREOF, CITY and COUNTY have caused this Amendment to be executed by their respective authorized offices, to be effective on the date first above written.

APPROVED AS TO FORM:

By Robert M. Sheffy for
City Attorney

Countersigned

By
Finance Director

CITY OF BAKERSFIELD

By
Mayor

"CITY"

APPROVED AS TO CONTENT:
Public Works Department

By
Director, Ed Schulz

APPROVED AS TO FORM:
Office of County Counsel

By Bruce Duelbust
Deputy

APPROVED AS TO CONTENT
Department of Public Works

By
Interim Director, Joel Heinrichs

COUNTY OF KERN

By Mary K. Shell
Chairman, Board of Supervisors
"COUNTY"

RJB:cf
CSA71AMD.A12

CITY OF BAKERSFIELD

EXHIBIT "1"

Kern County
Agt. # 480-89

89-197

AGREEMENT

Sewer Maintenance and
Sewage Transport, Treatment and Disposal
A Portion of County Service Area 71

THIS AGREEMENT, made and entered into as of the _____ day of AUG 3 0 1989, 1989, by and between the CITY OF BAKERSFIELD, a municipal corporation (hereinafter "CITY"), and the COUNTY OF KERN, a political subdivision of the State of California (hereinafter "COUNTY");

RECITALS

WHEREAS, both CITY and COUNTY are empowered to acquire, construct, operate and maintain sewerage systems that include, but are not limited to sewer lines, sewage lift stations, wastewater treatment plants and treated wastewater effluent disposal areas; and

WHEREAS, COUNTY established County Service Area 71 (hereinafter "CSA 71") to provide for the collection, treatment, disposal and maintenance of facilities for wastewater within its boundaries; and

WHEREAS, COUNTY has approved subdivisions and development within the area comprising CSA 71; and

WHEREAS, since the formation of CSA 71, the approval of subdivisions and developments have been and will continue to be conditioned upon the developers constructing certain sewer service improvements and dedicating and/or conveying those improvements and necessary easements to COUNTY; and

WHEREAS, COUNTY believes it would be more timely, efficient and a benefit to both the CITY and COUNTY if wastewater generated within portions of CSA 71 as designated within this Agreement were

OF BAKERS

transported to CITY's present or future proposed sewer trunk line that is best able to transport this wastewater for treatment and disposal by CITY; and

WHEREAS, CITY can effectively serve and provide sewerage services to the area designated on Exhibit "A" to this Agreement and hereinafter referred to as "CITY SERVICE AREA" and CSA 71 can provide sewerage service to the remainder of the territory through a separate agreement proposed to be entered into with the North of the River Sanitation District; and

WHEREAS, CITY and COUNTY are willing to accommodate the need for sewerage service and desire to cooperate in meeting the need for collection, treatment and disposal of wastewater within the boundaries of CSA 71 and agree that CITY shall be responsible for providing sewerage service to CITY SERVICE AREA, and COUNTY shall be responsible for collecting sewer service charges and paying CITY those amounts, all pursuant to the terms and conditions of this Agreement; and

WHEREAS, if service areas are not agreed upon, both CITY and COUNTY may continue to construct and plan sewerage facilities to serve uncertain and changing boundaries, potentially over-building said facilities and creating overlapping service areas; and

WHEREAS, neither CITY nor CSA 71 separately has sufficient funding to acquire or construct sewerage facilities that would be adequate for their individual needs, but jointly the two agencies have sufficient funding capability to acquire and construct a sewerage system that would be adequate to meet the needs of both

CITY OF BAKERSFIELD

agencies and, therefore, it is to the mutual benefit of both parties that a sewerage system be constructed to serve both CITY areas and CITY SERVICE AREA, with said sewerage system to be operated and maintained by CITY.

NOW, THEREFORE, in consideration of the mutual promises and covenants herein contained, CITY and COUNTY agree as follows:

1. CITY hereby agrees to accept sewage from the entire service area as shown on Exhibit "A" attached hereto and made a part of this Agreement and designated thereon as CITY SERVICE AREA, subject to the terms and conditions of this Agreement.

2. COUNTY hereby conveys to CITY those portions of the sewerage system within each tract or development previously dedicated or conveyed to COUNTY within CITY SERVICE AREA including, but not limited to, street laterals, sewage lift stations and necessary easements. Hereafter, upon completion and acceptance of a tract or subdivision within CITY SERVICE AREA, COUNTY shall convey to CITY those portions of the sewerage system within said completed and accepted tract or subdivision. COUNTY shall approve sewerage service improvements when appropriately engineered and constructed on the basis of directing the flow of sewage to certain proposed or existing sewer lines to be designated by mutual agreement between COUNTY and CITY.

3. Conveyance of all portions of the sewerage system by COUNTY to CITY as provided in Paragraph 2 of this Agreement is subject to the following:

a. CITY shall accept, maintain and operate all portions

OF BAKERS

of sewerage systems located in CITY SERVICE AREA;

b. CITY shall construct, or cause to be constructed, those trunk sewers found necessary by CITY to connect portions of sewerage systems located in CITY SERVICE AREA to trunk sewer lines of CITY and shall maintain and operate those connecting trunk sewers;

c. CITY expressly accepts responsibility and liability for any operation or maintenance task necessary to maintain the sewerage system in a serviceable condition, with the exception of service laterals (from use to main), and shall indemnify COUNTY from any liability resulting from any sewer-related operation or maintenance task performed after acceptance of the applicable portion of the system by CITY;

d. Maintenance and operation of sewerage systems, portions of sewerage systems and trunk sewers shall include, but not be limited to, sewer cleaning, root control, vector control, adjustment of sewer manholes to street grade, replacement and/or repair of sewers and sewer manholes, response to complaints of sewer stoppages, repair of roadways or easements if damaged by sewers or sewage (although this shall not relieve developers of their responsibilities during the one year guarantee period as provided in any subdivision improvement agreement between COUNTY and developer), and such other tasks as are required from time to

CITY OF BAKERSFIELD

time to maintain sewerage service provided, or to be provided, to property-owners and property located within CITY SERVICE AREA with the exception of service laterals;

e. The level of maintenance and operation provided by CITY shall be the same as that provided by CITY for sewerage service to properties located within CITY.

4. CITY shall permit COUNTY and residents and landowners within CITY SERVICE AREA to discharge sewage into CITY-operated sewerage system and agrees to transport it to a sewage plant and make proper disposal of all of said sewage, subject to those same regulations and restrictions as CITY requires of sewage generated within CITY.

5. Upon the date of this Agreement, or as soon thereafter as is practical, COUNTY shall transfer CSA 71 funds in the amount of $1,500,000 to an interest-bearing "CAPITAL IMPROVEMENT ACCOUNT" to be established and maintained by the Kern County Treasurer's Office.

6. CITY and COUNTY shall jointly, and to the satisfaction of each, determine the percentage of CITY SERVICE AREA to be served by each of the trunk sewers indicated on the drawing attached hereto and marked as Exhibit "A". Thereupon, the $1,500,000 transferred to CAPITAL IMPROVEMENT ACCOUNT shall be apportioned between the trunk sewers in accordance with the percentage of CITY SERVICE AREA to be served. Upon completion of construction of one or more of the trunk sewers, the funds apportioned to the completed sewer, along with interest accrued on that portion of the funds, shall be used to

Y OF BAKERSF

defray the cost of constructing the applicable trunk sewer with the intent to reduce assessments to be charged to properties within CITY SERVICE AREA for connection to that sewer or its tributary sewers.

7. As provided in Section 25210.72a of the Government Code, COUNTY may fix and collect charges for services provided within a county service area, including sewerage services, and COUNTY will fix and collect such charges for sewerage services provided to CITY SERVICE AREA.

8. The cost of maintenance and operation charged to property located in CITY SERVICE AREA shall be calculated in the same manner and shall be the same as those charges assessed to property with similar sewerage uses located within CITY. Neither COUNTY nor any property-owner or sewer user within CITY SERVICE AREA shall pay any sewer service charge, maintenance fee, or other related fee or charge for CITY providing sewerage service except as specifically provided for in this Agreement. This provision shall not prohibit CITY, COUNTY or a developer/property owner from initiating Assessment District proceedings for the purpose of financing capital improvements related to the transportation of sewerage generated within CITY SERVICE AREA, nor shall it prohibit CITY from charging a Connection Fee for connection to CITY facilities where that Connection Fee is equal to that charged to CITY properties receiving the same service, nor shall it prohibit CITY from charging for the previous oversizing of facilities as required by CITY Agreement No. 88-117 (Laborde), nor shall it prohibit CITY from charging an additional connection charge or surcharge to pay the cost of

CITY OF BAKERSFIELD

extending the CITY's Buena Vista sewer trunk line from the intersection of White Lane and Buena Vista Road to the City's Wastewater Treatment Plant No. 3.

9. COUNTY shall, annually, pay CITY for providing sewerage services to CITY SERVICE AREA. The amount to be paid CITY shall be the same as the amount charged to CITY properties for equivalent sewerage use and shall be the same as the sewer service charge established by the CITY each year on a charge per Equivalent Single Family Dwelling (ESFD) basis. The number of ESFD for which the CITY SERVICE AREA shall be charged shall be determined on the same basis used for CITY sewer connections calculated on March 1st of the year prior to the date payment is due and the rate shall be that established by CITY for the fiscal year (July 1 to June 30) following that March 1st date, with the payment due CITY on or before 20 calendar days following the second installment payment deadline date of the COUNTY taxes. That is, for the payment due CITY on or before April 30, 1990 the amount due shall be based upon the ESFD connected to the sewer on March 1, 1989 and calculated at the charge per ESFD in effect for CITY sewer users for fiscal year 1989-90.

10. At the time of connection to the sewer in CITY SERVICE AREA, CITY shall collect such Connection Fees as are required to reimburse CITY for construction costs of that portion of wastewater collection and disposal facilities reserved, constructed or made available for sewage flows from CITY SERVICE AREA. Additionally, CITY or COUNTY may collect such Assessment Fees as may be established from time to time in relation to assessment districts or

OF BAKERSF

other such means of financing construction of trunk sewers, collection sewer mains and local street sewers, with the funds to be conveyed to the applicable financing agency or entity. The intent is to have CITY form and administer assessment districts to cause to have installed trunk sewers, collection sewer mains and local street sewers.

11. COUNTY shall inspect, or cause to be inspected, construction of new or replacement building sewers from the building drain to, and including, the connection to sewer main. Building sewers shall thereafter be responsibility of the property owner. Building sewers located in the CITY SERVICE AREA shall be constructed to the standards of the COUNTY. Sewer connection permits may be issued by COUNTY but construction shall not be accepted as final until COUNTY is presented with verification from CITY that applicable Connection Fees have been paid. CITY may also collect at this time any oversizing charges and any pro-rated sewer service charge for the remaining portion of the fiscal year, this charge to be determined in the same manner as is used by CITY for CITY users at that time.

12. Issuance of sewer connection permits for industrial uses shall be subject to prior review and approval by CITY for the purpose of regulating constituents in sewage flows determined by CITY to potentially have adverse affect on wastewater treatment and disposal processing facilities. Industrial discharges from the CITY SERVICE AREA shall satisfy all requirements of Chapter 14.12 of the Bakersfield Municipal Code as the same exists and may later be amended.

CITY OF BAKERSFIELD

13. At such time as an area within CITY SERVICE AREA may annex into CITY, that portion of sewer service charges and/or fees associated with the annexed area shall no longer be charged to CITY SERVICE AREA, but upon completion of annexation shall become the responsibility of CITY to collect.

14. A Technical Advisory Committee (TAC) shall be created and be comprised of two members from each party and shall meet at least quarterly for the first four years of this Agreement and biannually thereafter. Additional meetings shall be convened when requested by either party to this agreement. As soon as practical following the effective date of this agreement, the TAC shall establish a proposed time schedule for construction of trunk lines to serve the CITY SERVICE AREA. This time schedule shall be periodically reviewed by the TAC for progress and compliance. The TAC shall also prepare recommendations for the two governing bodies regarding fees and charges, including level, duration and nature, as well as means of financing sewer line and other capital improvements.

15. Nothing in this Agreement shall be construed to prohibit CITY from contracting with North of the River Sanitary District or any other appropriate district to provide sewerage service for any portion of CITY SERVICE AREA if so recommended by the Technical Advisory Committee to be in the best interest of COUNTY, and approved by CITY and COUNTY.

16. Upon the advice of the TAC and based upon a persistent dispute as to the amount of sewer maintenance charges imposed by CITY, with six (6) month notice to CITY, COUNTY may assume

OF BAKERSF

responsibility for sewer maintenance in CITY SERVICE AREA, and that portion of the sewer service charge (representing sewer maintenance for the portion of the lines the COUNTY has elected to perform maintenance on) shall be deducted from monies which may become due CITY.

IN WITNESS WHEREOF, CITY and COUNTY have caused this Agreement to be executed by their respective authorized officers, to be effective on the date first above written.

APPROVED AS TO FORM:

By _____
City Attorney

Countersigned

By _____
Finance Director

APPROVED AS TO CONTENT:
Public Works Director

By _____
Director, Ed Schulz

APPROVED AS TO FORM:
Office of County Counsel

By _____
Deputy

APPROVED AS TO CONTENT:
Department of Public Works

By _____
Director, L. Dale Mills

agrmt.sew
SDS:fd/wl

CITY OF BAKERSFIELD

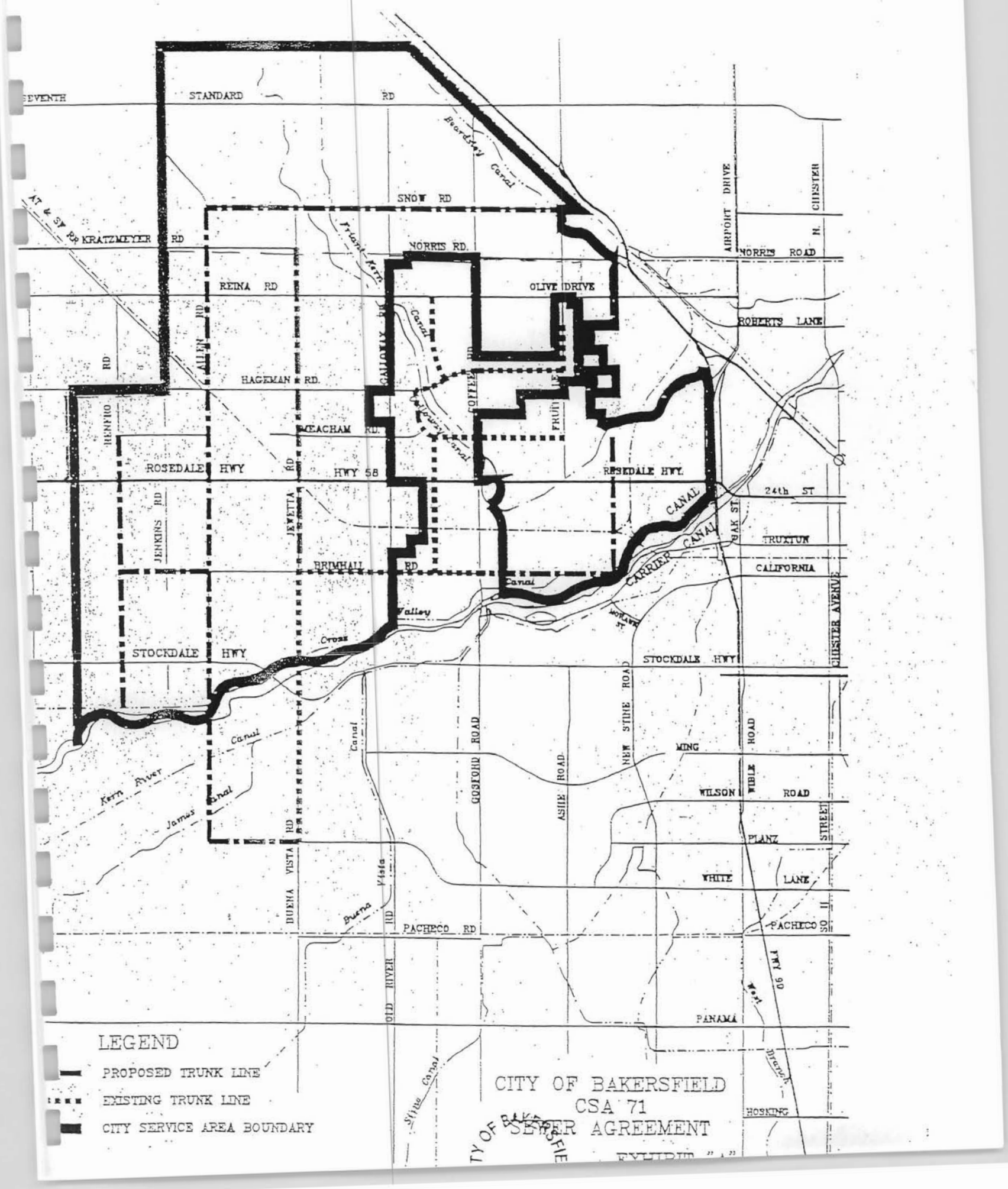
By _____
Mayor

"CITY"

COUNTY OF KERN

By _____
Chairman Board of Supervisors

"COUNTY" SEP 12 1989


SEVENTH
STANDARD
RD
Beardsley Canal
SNOW RD
AT & SF RR
KRATZMEYER RD
Friant-Kern
NORRIS RD.
AIRPORT DRIVE
CHESTER
NORRIS ROAD
REINA RD
OLIVE DRIVE
ROBERTS LANE
ALLEN RD
GALLOWAY
HAGEMAN RD.
FRUITVALE
HENSLEY CANAL
BEACHAM RD.
HENSLEY
ROSEDALE HWY
HWY 58
JENKINS RD
JEWETTA
BRIMHALL RD
CANAL
CARRIER
BAK ST
24th ST
TRUXTUN
CALIFORNIA
CHESTER AVENUE
WORLEY ST
STOCKDALE HWY
Kern River
James
Canal
GOSFORD ROAD
ASHE ROAD
NEW STINE ROAD
MING
WILSON
WIBLE ROAD
PLANZ
STREET
WHITE
LANE
BUENA VISTA RD
PACHECO RD
OLD RIVER
HWY 99
PANAMA
HOSKING
LEGEND
PROPOSED TRUNK LINE
EXISTING TRUNK LINE
CITY SERVICE AREA BOUNDARY
CITY OF BAKERSFIELD
CSA 71
SEWER AGREEMENT

KCD: County
Agt. # 042-93

AMENDMENT BETWEEN
NORTH OF RIVER SANITARY DISTRICT NO. 1, AND
COUNTY OF KERN

This AGREEMENT, made this 26th day of January, 1993, by and between the NORTH OF RIVER SANITARY DISTRICT NO. 1, a special district of the State of California (hereinafter referred to as "NORSD"), and the COUNTY OF KERN, a political subdivision of the State of California (hereinafter referred to as "COUNTY").

W I T N E S S E T H

WHEREAS, SHAFTER, NORSD and COUNTY entered into a Joint Exercise of Powers Agreement, dated February 6, 1990 (Exhibit "1") concerning planning, design, construction, operation and maintenance of sewerage improvements within various areas, which is incorporated by reference as though fully set forth herein; and

WHEREAS, per said agreement O & M costs are to be allocated to NORSD, COUNTY and SHAFTER based on flows; and

WHEREAS, COUNTY now anticipates discharging into NORRIS/SEVENTH STANDARD SEWER east of Jenkins Road, north of the City Service Area boundary, within County Service Area No. 71 shown on Exhibit "2".

NOW, THEREFORE, NORSD and COUNTY do hereby mutually agree as follows:

1. COUNTY will pay NORSD charges on or about July 1, 1993, and each year thereafter for service provided to sewer users discharging into the NORRIS/SEVENTH STANDARD SEWER east of Meter No. 1, calculated annually by taking the service charge assessed by NORSD minus five percent (5%) on sewer users in its own District as of August 1, 1992, and each and every year thereafter, and multiplying that figure by the number of equivalent single-family dwelling units connected to the public sewer in CSA No. 71 as of July 1, 1993, and each and every year thereafter. The five percent (5%. deduction is estimated to be the cost for operation and maintenance of the collection system between the discharger and the NORRIS/SEVENTH STANDARD SEWER. If the five percent(5%) estimate is later found not to accurately reflect the cost differential, the charges paid NORSD will be modified accordingly.

2. COUNTY will pay NORSD a connection fee for those sewer users discharging into the NORRIS/SEVENTH STANDARD SEWER east of Meter No. 1 at the same rate and in the same manner as NORSD charges those equivalent dischargers within NORSD's district boundaries.

3. COUNTY shall collect and pay NORSD prior to allowing discharge to the sewer a prorated portion of the current year's sewer service charge calculated as in Item 1. above for the balance of the current year ending June 30.

4. COUNTY shall not permit discharges to the sewer system of NORSD in violation of NORSD's adopted regulations.

5. Upon payment of the above charges and fees, NORSD shall continue to make available sewer capacity within the facilities of NORSD and thereafter transport, treat, and dispose of sewage discharged into the sewer line of NORSD.

IN WITNESS WHEREOF, NORSD and COUNTY have caused this agreement to be executed by their respective authorized officers, to be effective on the date first above written.

COUNTY OF KERN:

APPROVED AS TO FORM:

By Bruce Direlbin
Deputy, County Counsel

APPROVED AS TO CONTENT:

By Daphne W. Washington
Director
Waste Management

By Roy Ostelmeier
Chairman Board of
Supervisors

NORTH OF RIVER SANITARY DISTRICT:

APPROVED AS TO FORM:

By
District's Attorney

APPROVED AS TO CONTENT;

By
General Manager

By
President

Kern County

Agt. # 943-99

AGREEMENT NO. 99-266

SEWER MAINTENANCE AND SEWAGE TRANSPORT, TREATMENT AND DISPOSAL FOR A PORTION OF COUNTY SERVICE AREA 71

THIS AGREEMENT is made and entered into on OCT 20 1999, by and between the **CITY OF BAKERSFIELD**, a charter city and municipal corporation, ("CITY" herein) and the **COUNTY OF KERN**, a political subdivision of the State of California, ("COUNTY" herein).

RECITALS

WHEREAS, CITY and COUNTY have previously entered into several agreements concerning County Service Area 71 ("CSA 71" hereafter) concerning sewer service including agreements numbered 89-197 (CITY), 480-89 (COUNTY); 91-67 (CITY), 187-91 (COUNTY); and 93-149 (CITY), 109-92 (COUNTY); and

WHEREAS, CITY and COUNTY desire the above-listed agreements be terminated and all obligations, duties and rights set forth in said agreements be terminated and superseded by this Agreement; and

WHEREAS, CITY has awarded a contract for construction of the Allen Road Sewer Trunkline which can serve a portion of CSA 71; and

WHEREAS, COUNTY has previously contributed to the financing of the Jewetta Trunkline, the extension of the trunkline in Fruitvale Road and has constructed the trunkline in Olive Drive; and

WHEREAS, CITY intends to build another sewer trunkline known as the Buena Vista Sewer Trunkline II which can serve portions of CSA 71; and

WHEREAS, CITY estimates its cost of constructing the Allen Road Sewer Trunkline and Buena Vista Trunkline II will exceed Sixteen Million Dollars ($16,000,000); and

WHEREAS, the cost per MGD ("million gallons per day") will change from time to time as computed by CITY; and

WHEREAS, the cost per MGD calculation is attached to this Agreement as **Exhibit "G"**; and

CITY OF BAKERSFIELD OFFICIAL

WHEREAS, COUNTY wishes to connect to the Allen Road Sewer Trunkline to serve a portion of CSA 71; and

WHEREAS, COUNTY has currently available Two Million Dollars ($2,000,000) to pay for connecting a portion of CSA 71 to the Allen Road Sewer Trunkline; and

WHEREAS, both CITY and COUNTY are empowered to acquire, construct, operate and maintain sewerage systems; and

WHEREAS, COUNTY established CSA 71 to provide for sewerage service within its boundaries; and

WHEREAS, COUNTY has approved subdivision development in CSA 71 prior to the execution of this Agreement; and

WHEREAS, by this Agreement CITY AND COUNTY intend to designate an area within CSA 71 which will be allowed to connect to the CITY sewer system for the payment by COUNTY of Two Million Dollars ($2,000,000) for sewer trunkline fees and other fees as set forth below; and

WHEREAS, by this Agreement CITY and COUNTY are establishing conditions where other portions of CSA 71(beyond those set forth in **Exhibit "A"**) could receive sewer service through the CITY's facilities; and

WHEREAS, COUNTY may choose to expand the Sewer Service Area (**Exhibit "A"**) through additional payments; and

WHEREAS, the parties desire to define what payment amounts would be necessary to cover sewer trunkline fees in the event the COUNTY wishes to add "Eligible Area" or portion thereof (**Exhibit "B"**) to the "Sewer Service Area" (**Exhibit "A"**) or "Other Area" (**Exhibit "F"**); and

WHEREAS, areas set forth in **Exhibit "F"** may receive COUNTY service in the future for the payment of additional fees, these additional fees will be calculated on a formula similar to the formula set forth in **Exhibit "G,"** and said new formula will be subject to future negotiations; and

WHEREAS, CITY desires a limit on the maximum area to be served by CITY.

NOW, THEREFORE, incorporating the foregoing recitals herein, CITY and COUNTY mutually agree as follows:

1. AREAS OF SERVICE. The following exhibits are attached to this Agreement and each exhibit is incorporated by reference as though fully set forth. CITY and COUNTY agree the exhibits accurately reflect their intentions concerning service areas:

1.1 Exhibit "A": Shows the area which will be served upon the payment of Two Million Dollars ($2,000,000) and the fulfillment of other conditions set forth in this Agreement ("Sewer Service Area" herein);

1.2 Exhibit "B": Shows the area CITY sewer service may be expanded into upon the fulfillment of the conditions set forth in this Agreement ("Eligible Area" herein);

1.3 Exhibit "C": Shows the area within the original CSA 71 boundary which is now excluded from CITY sewer service under this Agreement;

1.4 Exhibit "D": Shows the area newly annexed and a part of CITY;

1.5 Exhibit "E": Shows the area currently served by North of the River Sanitary District No. 1 ("NOR").

1.6 Exhibit "F": Shows area for future service expansion by COUNTY which COUNTY may buy into for a contribution to future infrastructure costs (including but not limited to trunkline fees). A formula for the expansion of COUNTY service into these areas will be agreed to in the future. COUNTY and CITY agree the formula will be similar to the formula set forth in **Exhibit "G."**

1.7 Exhibit "G": Shows the MGD formula which will be used to calculate amounts that would be necessary for the COUNTY to pay the CITY to add territory to the "Service Area" (**Exhibit "A"**) from the "Eligible Area" (**Exhibit "B"**). All other applicable fees and policies would still be in effect.

2. PAYMENT AND SERVICE.

2.1 Sewer Service Area. COUNTY shall pay sewer trunkline fees to CITY in the sum of Two Million Dollars ($2,000,000) upon execution of this Agreement and CITY shall provide sewerage service to the area in CSA 71 designated in **Exhibit "A."** This area designated in **Exhibit "A"** as the Sewer Service Area is the only portion of CSA 71 that will be allowed to connect to the CITY sewer trunkline system for the Two Million Dollar ($2,000,000) payment. Connections outside the Sewer Service Area shall be permitted only under section 2.2 of this Agreement ("Adding Areas for Service"). COUNTY agrees to pay additional connection, operations and maintenance fees for all areas as set forth hereafter in this Agreement. CITY shall permit COUNTY and residents and landowners within Sewer Service Area to discharge sewage into CITY-operated sewerage system and agrees to transport it to a sewage plant and make proper disposal of all of said

sewage, subject to those same regulations and restrictions as CITY requires of sewage generated within CITY. COUNTY shall only accept properly disposed of sewage for discharge into CITY system. If areas within **Exhibit "A"** (Sewer Service Area) are annexed prior to their connection to the sewer a credit shall be given to COUNTY which may be used as part of any payment required under this Agreement for adding territory in the Eligible Area (**Exhibit "B"**). Said credit shall be based on the formula set forth in **Exhibit "G."** As for properties currently within the COUNTY and receiving service from CITY, CITY will continue to provide sewer service consistent with the terms of this Agreement.

2.2 **Adding Areas for Service.** In the Eligible Area only COUNTY shall be entitled to add area for sewer service in only the following way:

2.2.1 Eligible Area. COUNTY will pay all trunkline fees for the entire new area which COUNTY has requested be added to the Sewer Service Area. COUNTY understands and agrees that new areas must be of at least twenty (20) acres in size before CITY will approve service. Said payment will be made within thirty (30) days after submission by COUNTY of the written request for additional areas. The trunkline fees will be paid by COUNTY to CITY in an amount set by CITY in accordance with the terms of this Agreement. The connection fees shall be paid by the COUNTY within thirty (30) days of the time each property connects to the CITY sewer.

2.3 **Palm/Olive Areas.** Should any of the areas shown on **Exhibit "D"** de-annex and are no longer part of the CITY, said area shall become part of the Eligible Area (**Exhibit "B"**) and shall be subject to the same conditions for sewer service as other areas in **Exhibit "B."**

2.4 **Other Areas.** COUNTY may add areas beyond the Eligible Area by payment of a portion of future sewer collection system costs (including but not limited to trunkline fees). (See **Exhibit "F".**) A formula for the expansion of COUNTY service into these areas will be agreed to in the future. CITY and COUNTY agree the formula will be similar to the formula set forth in **Exhibit "G."**

3. **SERVICE AREAS.** **Exhibit "B"** will designate the total area within CSA 71 which may connect to the CITY sewer system ("Eligible Area"). **Exhibit "A"** will designate the area within the Eligible Area which will be able to connect upon completion of the CITY sewer trunkline now under construction. Thus, **Exhibit "A"** will set forth the area to be immediately served by CITY, and **Exhibits "B"** and "F" will designate the future area of service by CITY within the CSA 71 boundaries.

4. **OPERATION AND MAINTENANCE.** COUNTY shall own and properly maintain and operate all portions of the sewer system located within its jurisdiction. CITY shall own and properly maintain and operate all portions of the sewer system within its jurisdiction. The CITY's jurisdiction shall be deemed to be its corporate boundaries (city

limits). COUNTY shall pay to CITY, annually, for providing sewer service as set forth in this Agreement. Said payment shall be for the operation and maintenance of the CITY sewer system including wastewater treatment plants, pipeline maintenance and other associated expenses excepting operations and maintenance for the COUNTY maintained portions of the sewer lines. The amount paid by COUNTY to CITY shall be the same as would be charged by the CITY to CITY property owners for equivalent types of usage within the CITY's jurisdiction. The amount shall be calculated by CITY on the basis of sewer connections in the Sewer Service Area and said calculation shall be forwarded to COUNTY on or about March 1st of each year. The payment will be calculated on the rate established by CITY for the fiscal year (July 1 to June 30) following the March 1st date. The payment shall be due to CITY from COUNTY on or before thirty (30) calendar days following the second installment payment deadline date for COUNTY property taxes. Should COUNTY fail to pay the charges in a timely manner, COUNTY shall pay interest on the outstanding sum at the legal rate, compounded monthly, from the date the charges accrue. CITY shall give COUNTY notice of its failure to pay and COUNTY shall have ninety (90) days from the date of the notice from CITY to pay all past due charges plus interest. Should COUNTY fail to pay after the ninety (90) day cure period, COUNTY shall be in material breach of this Agreement. Maintenance and operation of sewerage systems, portions of sewerage systems and trunk sewers shall include, without restriction, sewer cleaning, root control, vector control, adjustment of sewer manholes to street grade, replacement and/or repair of sewers and sewer manholes, response to complaints to sewer stoppages, repair of roadways or easements if damaged by sewers or sewage (although this shall not relieve developers of their responsibilities during any guarantee period as provided in any subdivision improvement agreement between CITY or COUNTY and a developer), and other such tasks as are required from time to time to maintain sewerage service provided, or to be provided, to property owners. CITY shall have the right to terminate or suspend service to any parcel served under this Agreement in order to comply with State law.

5. **CONNECTION FEE.** COUNTY shall pay CITY fees set by CITY for each connection to any parcel in the Sewer Service Area. This connection fee is based upon capacity usage of the wastewater treatment facilities constructed by CITY. Said amount may be adjusted by CITY. CITY shall not charge property owners in the Sewer Service Area more than is charged to CITY users under similar circumstances. This fee is separate and distinct from any trunkline fees discussed above.

6. **CONSTRUCTION OF SEWERS.** Within one hundred eighty (180) days of the date of this Agreement, the COUNTY shall modify the COUNTY standards for sewers to the equivalent engineering standards for CITY sewers, COUNTY shall also, as a condition of approval of new tracts or other construction within the Sewer Service Area, Eligible Area or Other Area (**Exhibits "A," "B,"** and **"F"**), require that sewers be constructed to the new COUNTY standards. It shall be COUNTY's responsibility to inspect sewers in their area.

7. **INDUSTRIAL USERS.** Sewer connection permits for industrial users, as defined in the Bakersfield Municipal Code, shall be subject to prior written approval by CITY. Industrial users may not discharge sewerage constituents into the sewer system that have an adverse affect on pipelines, wastewater treatment and disposal facilities or public health. All industrial discharges must meet the requirements of the Bakersfield Municipal Code Chapter 14 as it now exists or may hereafter be amended as well as all State of California and United States laws and regulatory requirements.

8. **ANNEXATION.** Should any portion of the Sewer Service Area annex into CITY jurisdiction, that portion of the annual sewer operation and maintenance expense attributable to the annexed area shall no longer be paid by COUNTY; however, CITY shall collect such charges allowed by the Bakersfield Municipal Code from the annexed area unless the annexed area is part of the NOR service area.

9. **PREVIOUS AGREEMENT.** All previous agreements concerning CSA 71 sewerage between the CITY and COUNTY are hereby terminated. No rights, duties or obligations shall inure to or be imposed upon either party concerning the previous agreements for CSA 71 sewerage.

10. **ASSIGNMENT.** Neither this Agreement, nor any interest in it, may be assigned or transferred by any party without the prior written consent of all the parties. Any such assignment will be subject to such terms and conditions as CITY may choose to impose.

11. **BINDING EFFECT.** The rights and obligations of this Agreement shall inure to the benefit of, and be binding upon, the parties to the Agreement and their heirs, administrators, executors, personal representatives, successors and assigns.

12. **CORPORATE AUTHORITY.** Each individual signing this Agreement on behalf of entities represent and warrant that they are, respectively, duly authorized to sign on behalf of the entities and to bind the entities fully to each and all of the obligations set forth in this Agreement.

13. **EXECUTION.** This Agreement is effective upon execution. It is the product of negotiation and all parties are equally responsible for authorship of this Agreement. Section 1654 of the California Civil Code shall not apply to the interpretation of this Agreement.

14. **EXHIBITS.** In the event of a conflict between the terms, conditions or specifications set forth in this Agreement and those in exhibits attached hereto, the terms, conditions, or specifications set forth in this Agreement shall prevail. All exhibits to which reference is made in this Agreement are deemed incorporated in this Agreement, whether or not actually attached.

15. FORUM. Any lawsuit pertaining to any matter arising under, or growing out of, this Agreement shall be instituted in Kern County, California.

16. JOINT LIMITATION ON LIABILITIES AND INDEMNIFICATION.

16.1 Neither party shall be liable to the other party for any loss, damage, liability, claim or cause of action for damage to or destruction of property or for injury to or death of persons arising solely from any act or omission of the other party's officers, agents or employees.

16.2 CITY and COUNTY agree to indemnify and hold each other harmless from any and all claims, demands, liabilities, losses or causes of action which arise by virtue of its own acts or omissions (either directly or through or by its agents, officers, or employees) to such extent and in such part as the respective parties are found by reason of law to have proximately caused the injury or damage.

16.3 The party against whom any claim arising from any subject matter of this Agreement is filed shall give prompt notice of the filing of the claim to the other party.

17. MERGER AND MODIFICATION. All prior agreements between the parties are incorporated in this Agreement which constitutes the entire agreement. Its terms are intended by the parties as a final expression of their agreement with respect to such terms as are included herein and may not be contradicted by evidence of any prior agreement or contemporaneous oral agreement. The parties further intend this Agreement constitutes the complete and exclusive statement of its terms and no extrinsic evidence whatsoever may be introduced in any judicial or arbitration proceeding involving this Agreement. This Agreement may be modified only in a writing approved by the CITY Council and the COUNTY Board of Supervisors and signed by all the parties. CITY and COUNTY shall notify NOR of any proposed changes to this Agreement.

18. NEGATION OF PARTNERSHIP. CITY shall not become or be deemed a partner or joint venturer with COUNTY or associate in any such relationship with COUNTY by reason of the provisions of this Agreement. COUNTY shall not for any purpose be considered an agent, officer or employee of CITY, and CITY shall not for any purpose be considered an agent, officer or employee of COUNTY.

19. NON-INTEREST. No officer or employee of the CITY or COUNTY shall hold any interest in this Agreement (California Government Code section 1090).

20. NOTICES. All notices relative to this Agreement shall be given in writing and shall be personally served or sent by certified or registered mail and be effective upon actual personal service or depositing in the United States mail. The parties shall be addressed as follows, or at any other address designated by notice:

CITY: CITY OF BAKERSFIELD
City Hall
1501 Truxtun Avenue
Bakersfield, California, 93301

COUNTY: COUNTY OF KERN
Engineering and Survey Services Department
2700 M Street, Suite 570
Bakersfield, California 93301

21. **PRE-JUDGMENT INTEREST.** In the event of a default by any party to this Agreement, the non-defaulting party shall be allowed to recover interest on all damages at the legal rate from the date of the breach.

22. **TIME.** Time is of the essence in this Agreement.

23. **NO WAIVER OF DEFAULT.** The failure of any party to enforce against another a provision of this Agreement shall not constitute a waiver of that party's right to enforce such a provision at a later time, and shall not serve to vary the terms of this Agreement.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed, the day and year first-above written.

"CITY"
CITY OF BAKERSFIELD

By: _____
BOB PRICE, Mayor

"COUNTY"
COUNTY OF KERN

By: _____ OCT 26 1999
JON McQUISTON
Chairman, Board of Supervisors

APPROVED AS TO CONTENT:
PUBLIC WORKS DEPARTMENT

By: _____
RAUL ROJAS
Public Works Director

APPROVED AS TO CONTENT:
RESOURCE MANAGEMENT AGENCY

By: _____
DAVID PRICE III
Resource Management Agency Director

More Signatures on Following Page

APPROVED AS TO FORM:
BART J. THILTGEN
City Attorney

By: _____
ALAN D. DANIEL
Assistant City Attorney

APPROVED AS TO FORM:
OFFICE OF COUNTY COUNSEL

By: _____
STEPHEN D. SCHUETT
Assistant County Counsel

COUNTERSIGNED:

By: _____
GREGORY J. KLIMKO
Finance Director

ADD:dlr -

Attachments:
Exhibits "A," "B," "C," "D," "E," "F," & "G"

CERTIFICATE OF ADOPTION OF RESOLUTION
AUTHORIZING CHAIRMAN TO SIGN INSTRUMENT

The undersigned, Clerk of the Board of Supervisors of the County of Kern, hereby certifies that the following resolution was adopted by said Board of Supervisors at a regular meeting duly convened on the 26th day of October, 1999:

"WHEREAS, this Board has determined that the County of Kern should approve a certain Agreement No. 99-266 between Kern County and the City of Bakersfield re sewer maintenance and sewage transport, treatment and disposal for a portion of County Service Area 71 (Kern County Agreement No. 943-99), bearing the date October 20, 1999.

NOW, THEREFORE, BE IT RESOLVED by the Board of Supervisors of the County of Kern, State of California, that said instrument be, and it is hereby executed on behalf and in the name of said County of Kern, and the Chairman of this Board is hereby authorized and directed to sign his name thereto on behalf of said County."

The undersigned further certifies that on the date last mentioned the person who so signed said instrument was the duly elected Chairman of said Board and that his signature on said instrument is genuine.

The undersigned further certifies that said resolution was adopted by the following vote:

Ayes: McQuiston, Perez, Patrick, Peterson, Parra

Noes: None

Absent: None

Dated: October 26, 1999

BOARD OF SUPERVISORS KERN COUNTY, CA

DENISE PENNELL
Clerk of the Board of Supervisors
County of Kern

By: Judy A. Denny
Deputy Clerk

Reference: Item No. 5

Sewer Service Area

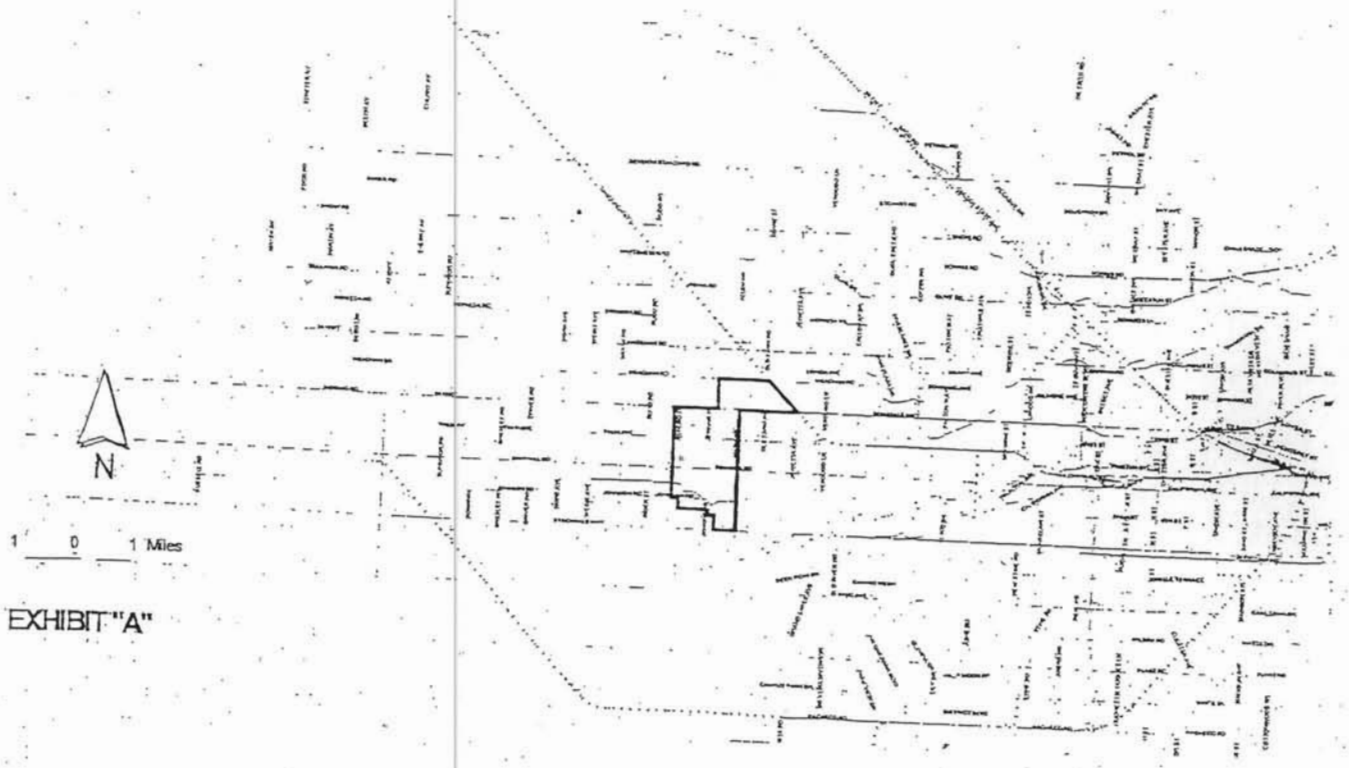


EXHIBIT "A"

Eligible Area

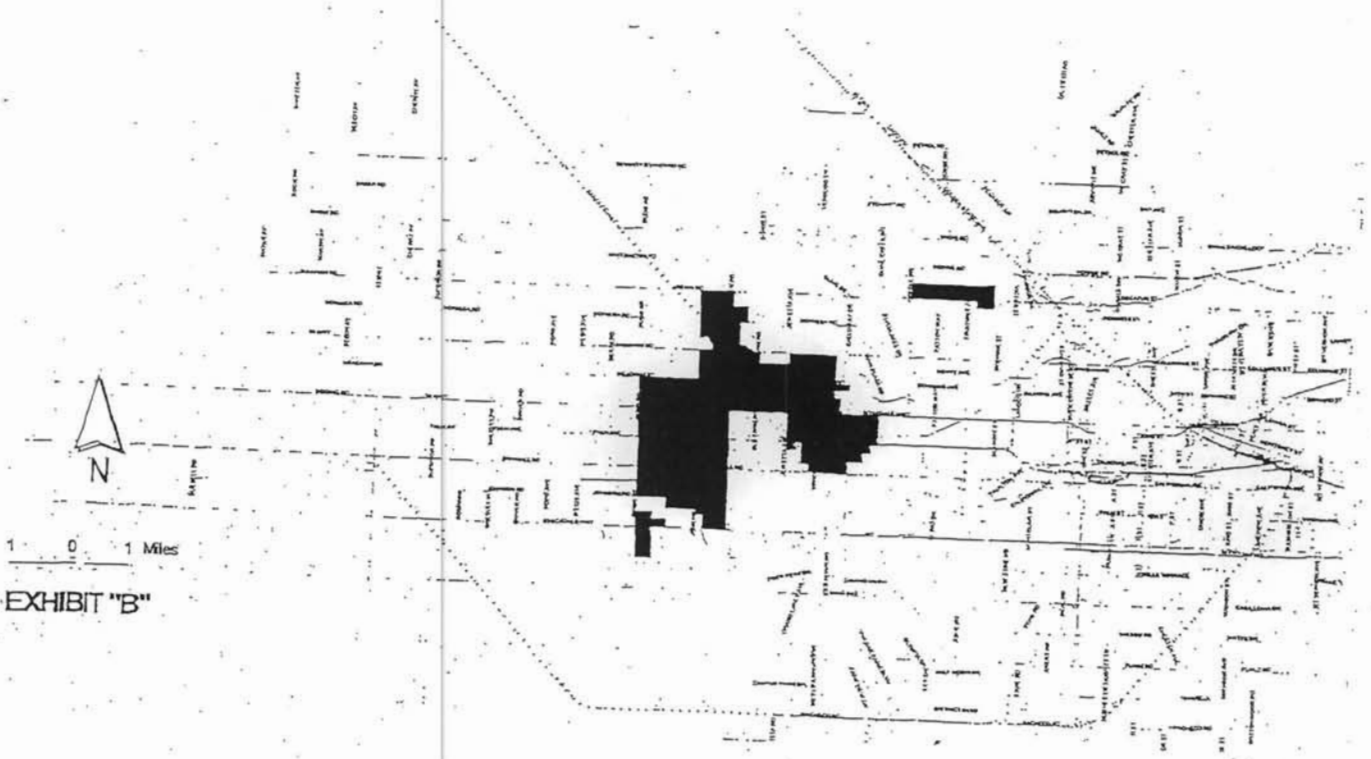


EXHIBIT "B"

CSA71 - AREA EXCLUDED FROM CITY SERVICE AREA

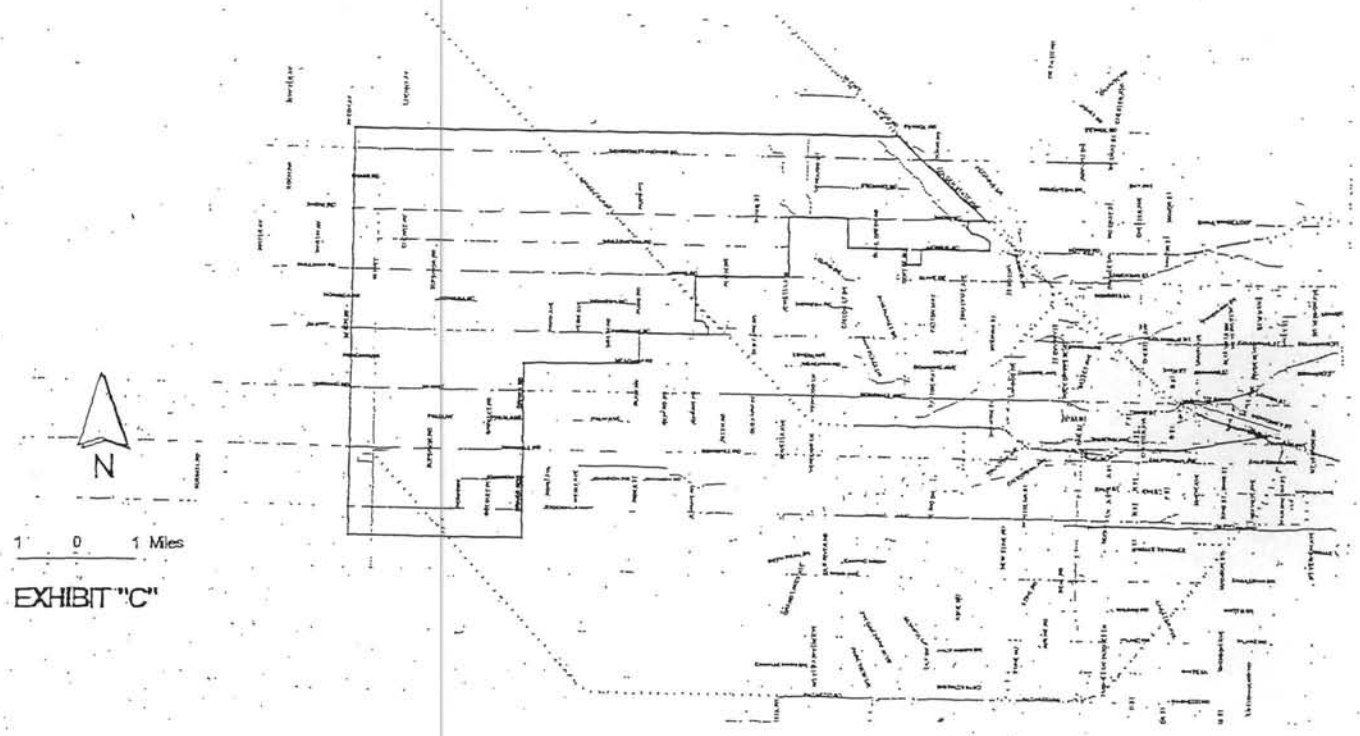


EXHIBIT "C"

New Annexations

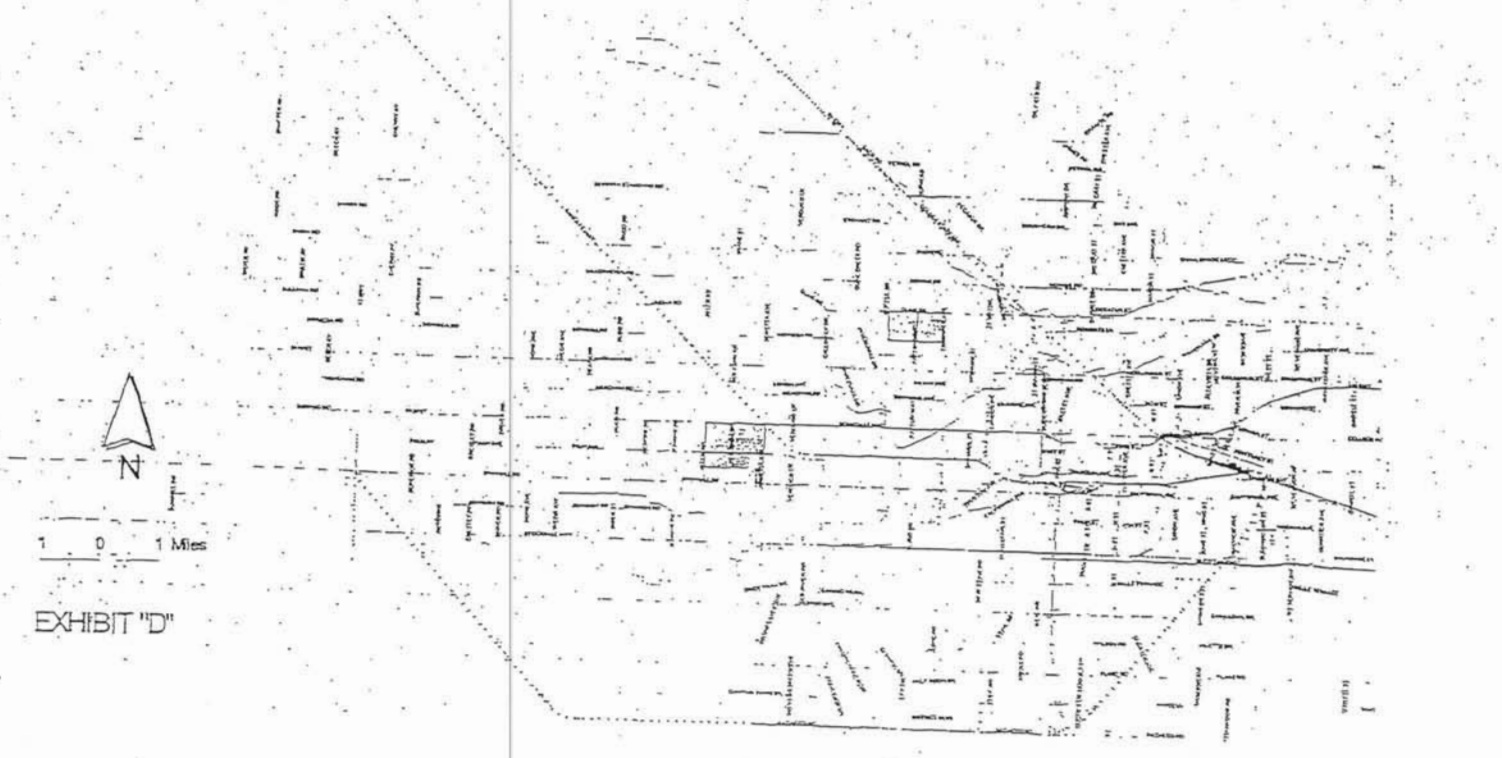


EXHIBIT "D"

North of the River Sanitary District No.1

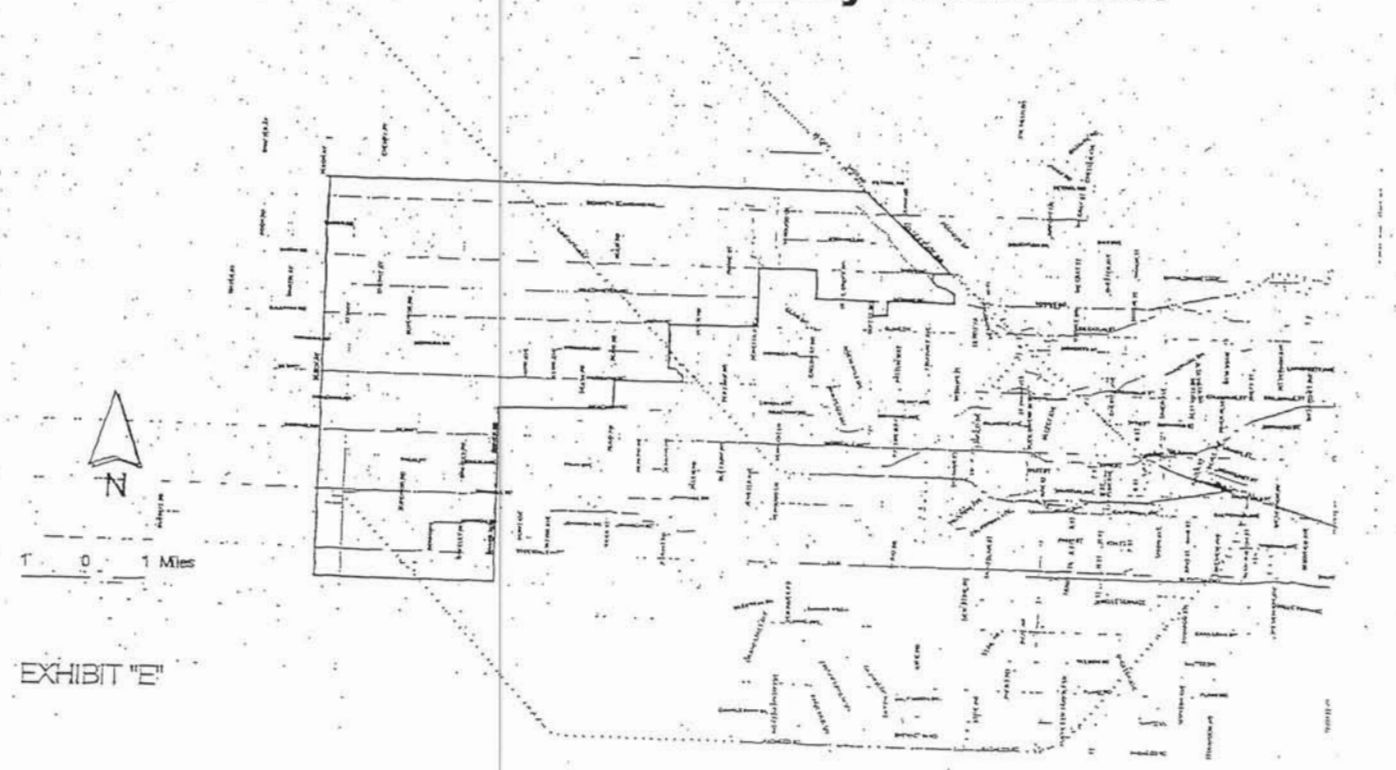


EXHIBIT "E"

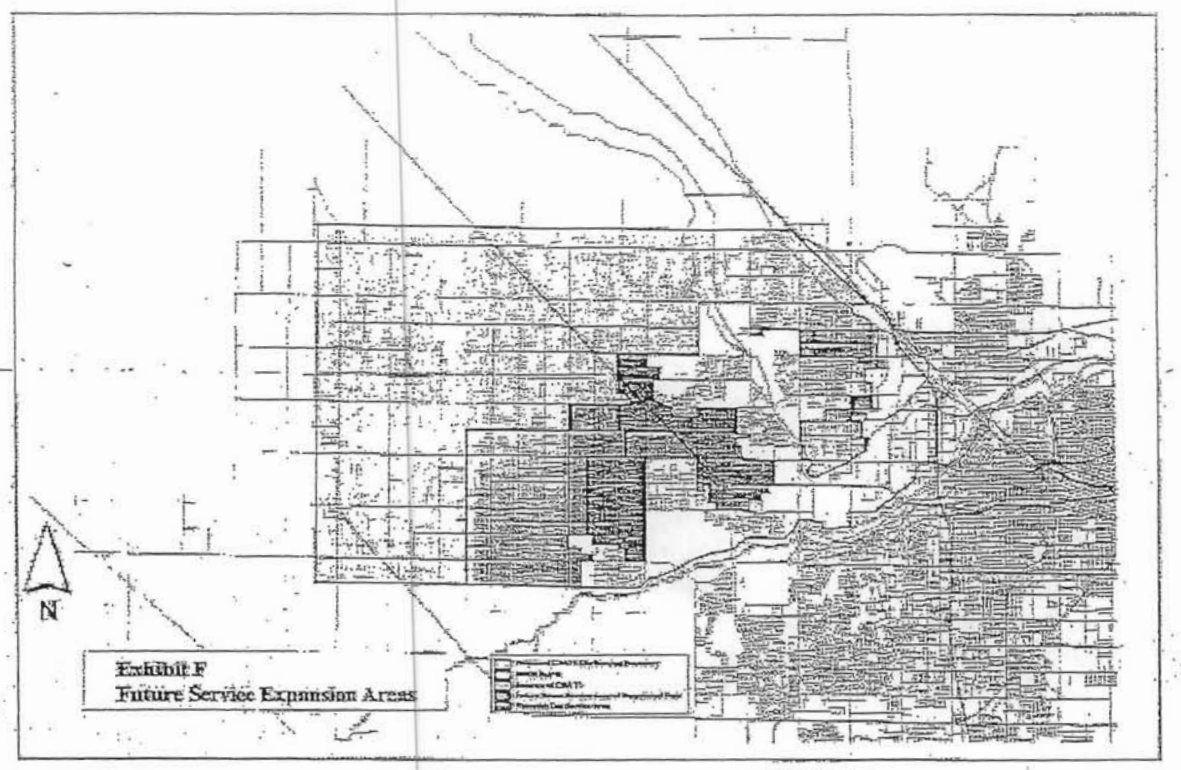

N
Exhibit F
Future Service Expansion Areas

EXHIBIT 'G'

MGD FORMULA

Total Flow for Service Area	=	27.85 MGD[1]
Total Cost of System	=	$16,000,000
Cost per MGD	=	$16,000,000 / 27.85 = $574,506 per MGD

An Area's Flow = Acreage x Factor per Acre[2]

The Area's Cost = $574,506 x Area Flow

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[1]The total design peak flow is calculated from actual base service area, north of the river, which the GIS application computed (21.91 MGD) plus Areas 4 & 5 flows from the Carollo study, south of the river (5.94 MGD).

[2]Each Land Use designation has a flow factor per acre associated with it, based upon Bakersfield City Standards.

AGREEMENT NO. 00-11

SEWER SERVICE BOUNDARY AGREEMENT BETWEEN THE CITY OF BAKERSFIELD AND NORTH OF THE RIVER SANITARY DISTRICT NO. 1

THIS AGREEMENT is made and entered into on JAN 12 2000, by and between the **CITY OF BAKERSFIELD**, a Charter city and municipal corporation, ("CITY" herein) and **NORTH OF THE RIVER SANITARY DISTRICT NO. 1**, a special district in the County of Kern, State of California, ("NOR" herein).

RECITALS

WHEREAS, both CITY and NOR are empowered to acquire, construct, operate, and maintain sewerage systems that include, but are not limited to, sewer lines, sewer lift stations, wastewater treatment plants and treated wastewater effluent disposal facilities; and

WHEREAS, CITY and NOR believe it would benefit both to establish a mutually agreed upon sewer service boundary understanding so both CITY and NOR can effectively plan for facilities required in their respective sewer service areas; and

NOW, THEREFORE, incorporating the foregoing recitals herein, CITY and NOR mutually agree as follows:

1. SEWER SERVICE AREA. CITY and NOR agree to the following sewer service area principles:

1.1 If the property is annexed to NOR, such areas within NOR shall be served by NOR;

1.2 If property is served by County through NOR and is annexed to CITY, such areas that are currently in the County which are being served by NOR would remain under NOR's jurisdiction and receive service from NOR after annexation;

1.3 Undeveloped property the County intends to serve through NOR, shown on Exhibit "A" as "proposed NOR Service Area Boundary", shall continue to be served by NOR should the City annex that property, and said property shall be required to be concurrently annexed to NOR. Undeveloped property within the "City Service Area"

CITY OF BAKERSFIELD
ORIGINAL

as shown on Exhibit "A" shall be served by the City.

1.4 NOR will collect connection fees, line charges, and service charges placed on the county tax rolls from NOR's service area as shown on Exhibit "A". City will collect connection fees, line charges, and service charges placed on the county tax rolls from City's service area as shown on Exhibit "A".

2. **MAINTENANCE AND ROADS.** Should NOR provide sewer service to an annexed area, NOR shall be solely responsible for all maintenance and repair of the sewer, sewer lines, wastewater treatment facilities and all materials and equipment related thereto. Should NOR excavate in CITY streets or rights-of-way in repairing or maintaining the above-listed facilities, *then the restoration of the street, right-of-way, or any damaged CITY-owned facility resulting from NOR's activities shall be repaired by NOR to the satisfaction of the City Engineer or, if not repaired by NOR, then repaired by CITY and billed to NOR. In restoring the street, right-of-way or other CITY facility, NOR shall use a contractor licensed in the State of California, with the appropriate speciality.* The CITY Engineer shall determine the level of restoration or repair required under this Agreement. NOR shall not be required to pay for any damage or repair unrelated to their activities. NOR shall indemnify and defend the CITY against all suits brought by third parties as a result of NOR's excavation activities as set forth in the indemnity provisions of this Agreement.

3. **SYSTEMS STAND ALONE.** CITY and NOR will provide sewerage service by maintaining completely separate systems. If CITY serves a local area, the sewerage shall be delivered to CITY for treatment. The same will apply to NOR.

4. **LEVEL OF SERVICE.** NOR agrees all sewer systems installed for CITY residents will meet or exceed CITY specifications. NOR agrees the level of service given to CITY residents will meet or exceed commonly accepted engineering standards. Where it is probable that areas will annex into the CITY, NOR agrees all sewers shall be installed to CITY specifications at a minimum, provided NOR has the jurisdiction to do so.

5. **FAILURE OF SEWER.** Should an NOR installed sewer line fail within the corporate boundaries of the CITY of Bakersfield for reasons related to or growing out of the installation or operation of said sewer line by NOR or its employees, agents, or independent contractors, NOR shall take immediate steps to repair and/or replace the same at the sole cost and expense of NOR. All roads and road surfaces, rights-of-way and CITY property damage shall be *repaired by NOR to the satisfaction of the City Engineer, or shall be* repaired by CITY and charged to NOR. CITY and NOR shall coordinate repair operations. Should CITY or its employees, agents, or independent contractors, damage NOR's sewer lines, facilities or property, CITY shall immediately repair, and/or replace same *to the satisfaction of NOR* at the sole cost and expense of CITY, *and if not repaired by CITY, then repaired by NOR and billed to CITY*.

CITY OF BAKERSFIELD
ORIGINAL

6. **ACCEPTANCE OF WORK OR SERVICES**. The acceptance of work or services, or payment for work or services, by CITY shall not constitute a waiver of any provisions of this Agreement.

7. **ASSIGNMENT**. Neither this Agreement, nor any interest in it, may be assigned or transferred by any party without the prior written consent of all the parties. Any such assignment will be subject to such terms and conditions as CITY may choose to impose. CITY shall not unreasonably withhold its consent.

8. **BINDING EFFECT**. The rights and obligations of this Agreement shall inure to the benefit of, and be binding upon, the parties to the Agreement and their heirs, administrators, executors, personal representatives, successors and assigns.

9. **CITY INSURANCE**. CITY represents it is self-insured and will, throughout the term of the this Agreement, maintain its insurance program. CITY warrants that, at all times during the term of this Agreement, it shall have and maintain workers' compensation insurance in compliance with the Labor Code of the State of California.

10. **COMPLIANCE WITH ALL LAWS**. NOR and CITY shall, at their respective sole costs, comply with all of the requirements of Municipal, State, and Federal authorities now in force, or which may hereafter be in force, pertaining to this Agreement, and shall faithfully observe in all activities relating to or growing out of this Agreement all Municipal ordinances and State and Federal statutes, rules or regulations, and permitting requirements now in force or which may hereafter be in force.

11. **AUTHORITY**. Each individual signing this Agreement on behalf of entities represent and warrant that they are, respectively, duly authorized to sign on behalf of the entities and to bind the entities fully to each and all of the obligations set forth in this Agreement.

12. **EXECUTION**. This Agreement is effective upon execution. It is the product of negotiation and all parties are equally responsible for authorship of this Agreement. Section 1654 of the California Civil Code shall not apply to the interpretation of this Agreement.

13. **EXHIBITS**. In the event of a conflict between the terms, conditions or specifications set forth in this Agreement and those in exhibits attached hereto, the terms, conditions, or specifications set forth in this Agreement shall prevail. All exhibits to which reference is made in this Agreement are deemed incorporated in this Agreement, whether or not actually attached.

14. **FORUM**. Any lawsuit pertaining to any matter arising under, or growing out of, this Agreement shall be instituted in Kern County, California.

CITY OF BAKERSFIELD
ORIGINAL

15. FURTHER ASSURANCES. Each party shall execute and deliver such papers, documents, and instruments, and perform such acts as are necessary or appropriate, to implement the terms of this Agreement and the intent of the parties to this Agreement.

16. INSURANCE. In addition to any other insurance or bond required under this Agreement, NOR shall procure and maintain for the duration of this Agreement the following types and limits of insurance ("basic insurance requirements" herein):

16.1 **Automobile liability insurance,** providing coverage on an occurrence basis for bodily injury, including death, of one or more persons, property damage and personal injury, with limits of not less than One Million Dollars ($1,000,000) per occurrence; and the policy shall:

16.1.1 Provide coverage for owned, non-owned and hired autos.

16.1.2 Contain an additional insured endorsement in favor of the CITY, its mayor, council, officers, agents and employees.

16.2 **Broad form commercial general liability insurance,** ISO form CG00 01 11 85 or 88 providing coverage on an occurrence basis for bodily injury, including death, of one or more persons, property damage and personal injury, with limits of not less than One Million Dollars ($1,000,000) per occurrence; and the policy shall:

16.2.1 Provide contractual liability coverage for the terms of this Agreement.

16.2.2 Contain an additional insured endorsement in favor of the CITY, its mayor, council, officers, agents, employees and designated volunteers.

16.3 **Workers' compensation insurance** with statutory limits and employer's liability insurance with limits of not less than One Million Dollars ($1,000,000) per occurrence; and the policy shall contain a waiver of subrogation endorsement in favor of the CITY, its mayor, council, officers, agents, employees and designated volunteers.

All policies required of NOR shall be primary insurance as to the CITY, its mayor, council, officers, agents, employees, or designated volunteers and any insurance or self-insurance

CITY OF BAKERSFIELD
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maintained by the CITY, its mayor, council, officers, agents, employees, and designated volunteers shall be excess of NOR's insurance and shall not contribute with it. Additional insured endorsement shall use ISO form CG20 10 11 85 (in no event with an edition date later than 1990).

Insurance is to be placed with insurers with a Bests' rating of no less than A:VII. Any deductibles, self-insured retentions or insurance in lesser amounts, or lack of certain types of insurance otherwise required by this Agreement, or insurance rated below Bests' A:VII, must be declared prior to execution of this Agreement and approved by the CITY in writing.

All policies shall contain an endorsement providing the CITY with thirty (30) days written notice of cancellation or material change in policy language or terms. All policies shall provide that there shall be continuing liability thereon, notwithstanding any recovery on any policy.

The insurance required hereunder shall be maintained for the duration of this Agreement.

NOR shall furnish the City Risk Manager with a certificate of insurance and required endorsements evidencing the insurance required. The CITY may withdraw its offer of contract or cancel this contract if certificates of insurance and endorsements required have not been provided prior to the execution of this Agreement.

Full compensation for all premiums which NOR is required to pay on all the insurance described herein shall be considered as included in the prices paid for the various items of work to be performed under the Agreement, and no additional allowance will be made therefor or for additional premiums which may be required by extensions of the policies of insurance.

It is further understood and agreed by NOR that its liability to the CITY shall not in any way be limited to or affected by the amount of insurance obtained and carried by NOR in connection with this Agreement.

Unless otherwise approved by the CITY, if any part of the work under this Agreement is subcontracted, the "basic insurance requirements" set forth above shall be provided by, or on behalf of, all subcontractors even if the CITY has approved lesser insurance requirements for NOR.

17. JOINT LIMITATION ON LIABILITIES AND INDEMNIFICATION.

17.1 Neither party shall be liable to the other party for any loss, damage, liability, claim or cause of action for damage to or destruction of property or for injury to or death of persons arising solely from any act or omission of the other party's officers, agents or employees.

CITY OF BAKERSFIELD
ORIGINAL

17.2 CITY and NOR agree to indemnify and hold each other harmless from any and all claims, demands, liabilities, losses or causes of action which arise by virtue of its own acts or omissions (either directly or through or by its agents, officers, or employees) to such extent and in such part as the respective parties are found by reason of law to have proximately caused the injury or damage.

17.3 The party against whom any claim arising from any subject matter of this Agreement is filed shall give prompt notice of the filing of the claim to the other party.

18. **MERGER AND MODIFICATION.** All prior agreements between the parties are incorporated in this Agreement which constitutes the entire agreement. Its terms are intended by the parties as a final expression of their agreement with respect to such terms as are included herein and may not be contradicted by evidence of any prior agreement or contemporaneous oral agreement. The parties further intend this Agreement constitutes the complete and exclusive statement of its terms and no extrinsic evidence whatsoever may be introduced in any judicial or arbitration proceeding involving this Agreement. This Agreement may be modified only in a writing approved by the CITY Council and NOR and signed by all the parties.

19. **NEGATION OF PARTNERSHIP.** CITY and NOR shall not become or be deemed partners or joint venturers with one another or associate in any such relationship with one another by reason of the provisions of this Agreement. NOR shall not for any purpose be considered an agent, officer or employee of CITY, and CITY shall not for any purpose be considered an agent, officer or employee of NOR.

20. **NO WAIVER OF DEFAULT.** The failure of any party to enforce against another a provision of this Agreement shall not constitute a waiver of that party's right to enforce such a provision at a later time, and shall not serve to vary the terms of this Agreement.

21. **NON-INTEREST.** No officer or employee of the CITY shall hold any interest in this Agreement (California Government Code section 1090).

22. **NOTICES.** All notices relative to this Agreement shall be given in writing and shall be personally served or sent by certified or registered mail and be effective upon actual personal service or depositing in the United States mail. The parties shall be addressed as follows, or at any other address designated by notice:

CITY: CITY OF BAKERSFIELD
City Hall
1501 Truxtun Avenue
Bakersfield, California, 93301

CITY OF BAKERSFIELD ORIGINAL

NOR: NORTH OF THE RIVER
SANITARY DISTRICT NO. 1
5001 Olive Drive
Bakersfield, California 93308

23. TIME OF EFFECTIVENESS. Unless otherwise provided, this Agreement shall take effect when all of the following events have occurred:

23.1 This Agreement has been signed on behalf of NOR by the person(s) authorized to bind NOR hereto;

23.2 This Agreement has been approved by the CITY's Council;

23.3 This Agreement has been signed by the appropriate CITY Department;

23.4 The Office of the CITY Attorney has signed;

23.5 The Office of the City Finance Director has signed; and

23.6 This Agreement has been signed on behalf of the CITY by the Mayor or Vice-Mayor.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be executed, the day and year first-above written.

"CITY"

CITY OF BAKERSFIELD

By: _____
BOB PRICE, Mayor

"NOR"

NORTH OF THE RIVER
SANITARY DISTRICT NO. 1

By: _____
President of the Board

APPROVED AS TO CONTENT:
PUBLIC WORKS DEPARTMENT

By: _____
RAUL ROJAS
Public Works Director

By: _____
Manager

More Signatures on Following Page

CITY OF BAKERSFIELD ORIGINAL

APPROVED AS TO FORM:
BART J. THILTGEN
City Attorney

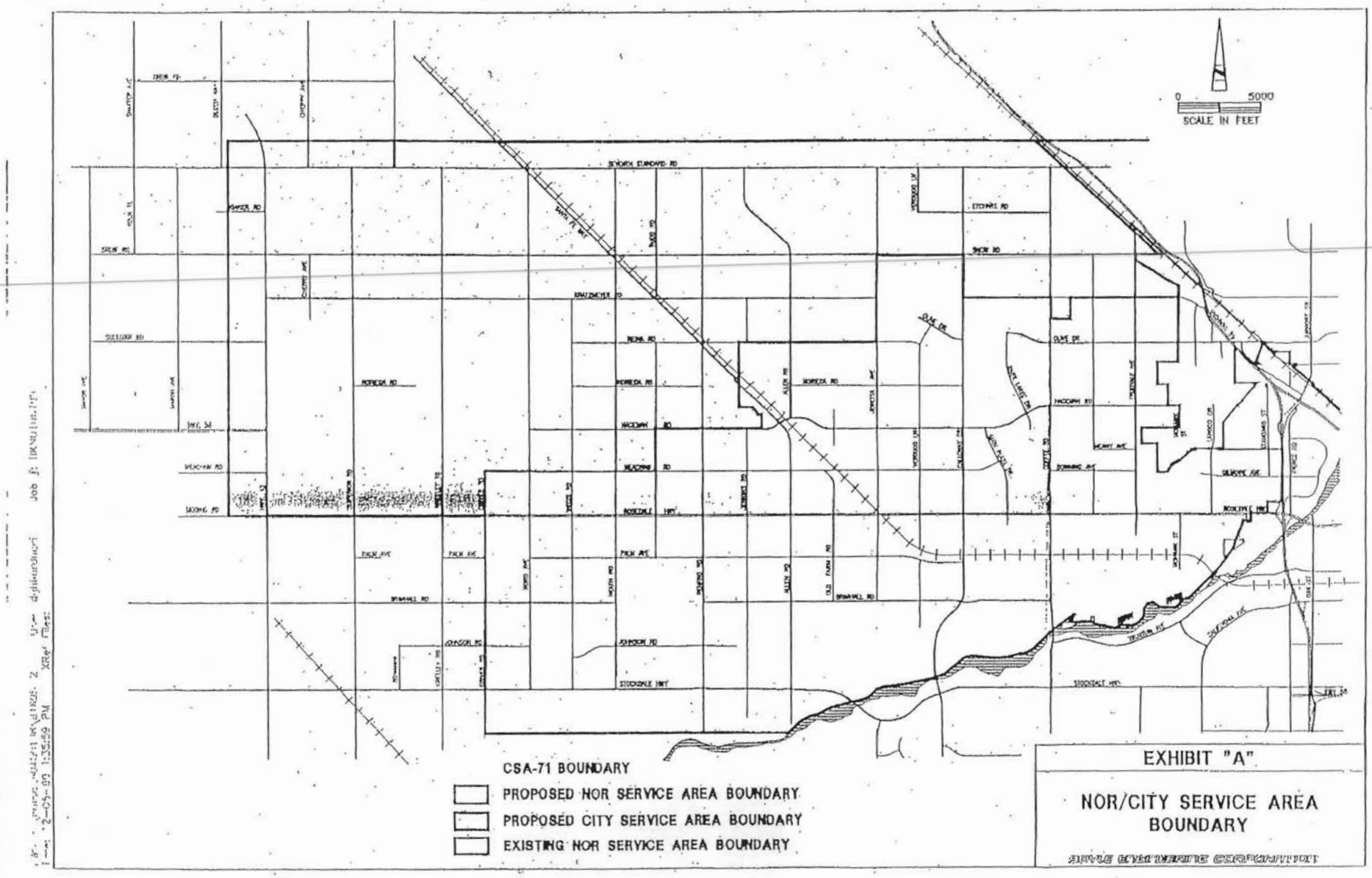
By: _____
ALAN D. DANIEL
Deputy City Attorney

By: _____
Attorney for North of the River
Sanitary District No. 1

COUNTERSIGNED:

By: _____
GREGORY J. KLIMKO
Finance Director

CITY OF BAKERSFIELD
ORIGINAL


0
5000
SCALE IN FEET
CSA-71 BOUNDARY
PROPOSED NOR SERVICE AREA BOUNDARY
PROPOSED CITY SERVICE AREA BOUNDARY
EXISTING NOR SERVICE AREA BOUNDARY
EXHIBIT "A"
NOR/CITY SERVICE AREA BOUNDARY

APPENDIX D

Odor Control Issues

There is a potential for odor generation in sewers and pumping stations at certain conditions. The prime source of odor in sewers is hydrogen sulfide gas generated in the absence of oxygen when naturally present anaerobic bacteria converts sulfate to sulfide and subsequently to malodorous hydrogen sulfide gas. Other sources of wastewater odor are ammonia, indoles, skatoles and mercaptans. Factors contributing to odor generation include characteristics of the sewage such as sulfate content, temperature, pH, stream velocity, organic strength, and the length of time during which the wastewater remains in the collection system. Hydraulic characteristics of a sewer or a pumping station such as sudden drops may enhance evolution of the gases from the wastewater. The solutions to odor problems are specific to a particular collection system. It is possible, during system or subsystem design, to predict potential odor problems and to modify the design (grades, pump centrals, pump and wet well sizing) to prevent such odors. Alternatively, design may include one or more of the following odor controls:

1. Air or oxygen injection - presence of dissolved oxygen in concentrations higher than 1.0 mg/L prevents formation of sulfides (HS-) and hydrogen sulfide (H_2S).
2. Addition of oxidizing chemicals that convert sulfides to sulfate or even sulfur, depending on concentration and pH:
    a) Chlorine or chlorine chemicals (sodium hypochlorite)
    b) Hydrogen peroxide
    c) Potassium Permanganate
3. Addition of nitrates - nitrates serve as an alternative electron acceptor for sulfide bacteria and prevent creation of hydrogen sulfice.
4. Addition of nutrients and nitrate producing bacteria to the sewer that covers/deactivates the anaerobic slime film in sewers.
5. Metallic ions - usually ferric sulfate; sulfides precipitate as iron sulfide, FeS.
6. Lime and other alkalis - elevated pH shifts the chemical equilibrium toward sulfides (HS-) and prevents evolution of hydrogen sulfide gas.
7. Treatment of "off gas" - used mainly for pumping stations, this includes different types of air scrubbers or hydrogen sulfide absorbers.
    a) Alkaline/oxidant (chlorine or other oxidant) scrubbers.
    b) Iron sponge absorbers.
    c) Proprietary batch absorbers (SulfaTreat TM) based on granular, singular use magnetite (an oxide of iron) media.
8. Addition of odor masking sprays into the pump well or spraying/adding chemicals that combine with odorous compounds (ozone).