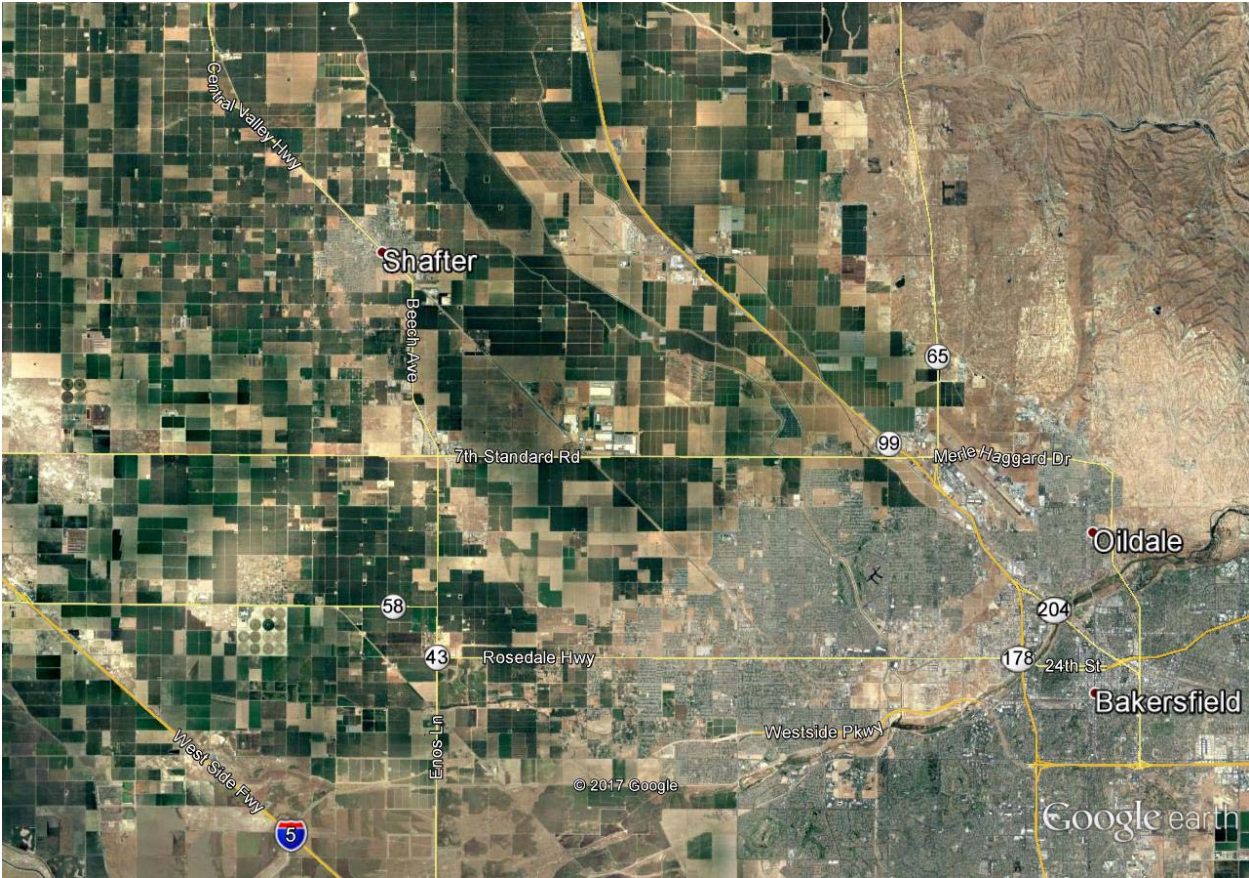


NORTH OF RIVER SANITARY DISTRICT

Kern County, California

MASTER SEWER PLAN UPDATE

March 30, 2018



MASTER SEWER PLAN UPDATE

March 30, 2018

Prepared For:

North of River Sanitary District
204 Universe Avenue
Bakersfield, California 93308

Patrick Ostly
General Manager

Prepared By:

AECOM
5001 E. Commercenter Drive, Suite 100
Bakersfield, California 93309



JT Gardiner, PE
Project Manager



Tyler Hunt, PE
Project Engineer

AECOM Project No. 60545074

Table of Contents

Acronyms and Abbreviations.....	v
Section 1 Introduction.....	1-1
1.1 Introduction & Study Area.....	1-1
1.2 Background.....	1-1
1.3 Objectives of the Master Plan Update.....	1-2
1.4 Topography and Climate.....	1-3
1.5 Methodology.....	1-3
1.6 Road Names Used.....	1-4
1.7 Additional Studies.....	1-4
Section 2 Existing Facilities.....	2-1
2.1 Outfall Sewer Capacity Rights.....	2-1
2.2 Collection System.....	2-1
2.3 Wastewater Treatment Plant Capacity Rights.....	2-3
2.4 Wastewater Treatment Plant.....	2-3
2.5 Effluent Storage.....	2-4
2.6 Effluent Disposal.....	2-4
2.7 Sludge Disposal.....	2-4
Section 3 Population & Sewage Flow Projections for Purposes of Conveyance.....	3-1
3.1 Population Projections.....	3-1
3.2 Estimated Sewage Flows at Buildout.....	3-1
3.2.1 Flows per SFRE (gpd/SFRE).....	3-2
3.2.2 Distribution of Average Day Sewage Flows at Build-Out.....	3-2
3.2.3 Sewage Flow at Build-Out.....	3-2
Section 4 Wastewater Characteristics at WWTP.....	4-1
4.1 Influent Wastewater Flow.....	4-1
4.2 Biological Oxygen Demand.....	4-3
4.3 Total Suspended Solids.....	4-5
4.4 Effluent Wastewater Flow.....	4-8
Section 5 Collection System Evaluation.....	5-1
5.1 Evaluation Criteria.....	5-1

5.2	Hydraulic Model Analysis	5-1
5.3	Overcapacity Sewer Pipeline Segments	5-1
5.4	Negative Slope Sewer Pipeline Segments	5-2
5.5	Oildale Sewer System	5-3
5.6	Future Outfall Sewer System	5-3
Section 6 Sewer Design Considerations		6-1
6.1	Types of Sewers within NORSD	6-1
6.2	Responsibility for Funding and Constructing Sewers within NORSD	6-1
6.3	Topographic Considerations for Design of Interceptor and Trunk Sewers	6-1
6.4	Sewer Capacity vs. Slope	6-2
Section 7 Trunk and Interceptor Sewers		7-1
7.1	Introduction	7-1
7.2	Parallel Trunk Sewer	7-1
7.3	Interceptor Sewers	7-2
Section 8 Wastewater Treatment Plant Evaluation		8-1
8.1	Evaluation Criteria	8-1
8.2	Overall Treatment Capacity	8-1
8.3	Headworks	8-1
8.4	Grit Removal	8-2
8.5	Primary Clarifier	8-2
8.6	Trickling Filter	8-3
8.7	Secondary Clarifier	8-4
8.8	Sludge Treatment	8-4
8.9	Sludge Dewatering and Disposal	8-5
8.10	Effluent Storage	8-6
8.11	Effluent Disposal	8-6
8.12	Cogeneration	8-6
Section 9 Recommended Collection System Improvements		9-1
9.1	Cost Estimate Introduction	9-1
9.2	Items Not Included	9-1
9.3	Parallel Outfall Sewer	9-1

9.4	Interceptor Sewers.....	9-2
9.5	Norris Road Sewer Replacement	9-2
9.6	Collection System Improvements	9-3
Section 10 Planned WWTP Expansion and Recommended WWTP Improvements.....		10-1
10.1	Background Assumptions for Expansion of the WWTP	10-1
10.2	Master Expansion Plan for WWTP	10-1
10.3	Cost Estimate Introduction.....	10-2
10.4	Items Not Included	10-2
10.5	New Plant Workshop Facility	10-13
10.6	Headworks Improvements.....	10-13
10.7	Additional Primary Clarifiers.....	10-13
10.8	Waste Activated Sludge Treatment System	10-13
10.9	Additional Secondary Clarifiers.....	10-14
10.10	Additional Digesters & Solids Handling.....	10-14
10.11	Cogeneration Improvements	10-15
10.12	Solar	10-15
10.13	Summary of Planned Expansion	10-16

Appendices

Appendix A – 1990 Joint Powers Agreement and Cooperative Agreement Between the City of Shafter and North of River Sanitary District Regarding Sewer Capacity

Appendix B – Waste Discharge Requirements (Order No. R5-2011-0011, adopted February 3, 2011)

Appendix C – Effluent Disposal Water Balance – 2017

Appendix D – Parallel Trunk Sewer Cost Opinion

Appendix E – Interceptor Sewer Cost Opinion

Acronyms and Abbreviations

AF	Acre-Feet
BOD ₅	Biological Oxygen Demand (over 5-day period)
District	North of River Sanitary District
F	Fahrenheit
gpcd	Gallons Per Capita Day
NORS	North of River Sanitary District
mg/L	Milligrams Per Liter
MGD	Million Gallons Per Day
RWQCB	Regional Water Quality Control Board
TSS	Total Suspended Solids
WDR	Waste Discharge Requirements
WWTP	Wastewater Treatment Plant
cf	Cubic Feet Per Date
HRT	Hydraulic Retention Time
SGMA	Sustainable Groundwater Management Act

Section 1

Introduction

1.1 Introduction & Study Area

The North of River Sanitary District (NORSRD or District) serves the unincorporated community of Oildale, the northern portion of County Service Area 71 (CSA 71) which includes portions of the City of Bakersfield, and the City of Shafter located in Kern County, California as shown in **Figure 1-1**. The District provides wastewater collection and wastewater treatment for a population of more than 55,000 people and a service area of approximately 54 square miles. The purpose of this report is to provide an update to the District's Master Sewer Plan. The District boundary and sphere of influence is included in **Figure 1-2**.

1.2 Background

North of River Sanitary District (NORSRD) was formed in 1940. The original service area was confined to Oildale north of the Kern River. By the 1980s the original WWTP was becoming surrounded by encroaching development. In addition, the WWTP, which was constructed in the early 1950s, was approaching its treatment capacity and the available treated effluent disposal area was inadequate.

A Joint Powers Agreement (JPA) was executed in 1990, by NORSRD, Kern County (County Service Area 71 [CSA-71]), and the City of Shafter. The JPA pertained to *Project Facilities*. Page 14 of the JPA states “...NORSRD shall administer, operate, and maintain the project facilities, and administer and supervise the construction and installation of the project facilities...”

In 1991, the District constructed a sewer from the original WWTP to a proposed WWTP site five miles west of Enos Lane on 7th Standard Road. This sewer is hereafter referred to as the Outfall Sewer. Under the JPA, City of Shafter acquired 3 million gallons per day (MGD) of the average day capacity of the outfall sewer between Shafter Avenue and the WWTP site.

Treated wastewater storage ponds were built at the new site and treated effluent from the existing WWTP was conveyed to the new ponds. The original WWTP continued to operate for approximately 10 years.

In January 1998, the District and the City of Shafter entered into another agreement under which the City of Shafter purchased one-third of the *actual maximum capacity* of the WWTP (which was constructed several years later). The term *actual maximum capacity* was not defined. However, the WWTP was originally designed with a capacity of 5.88 MGD and permitted by the Regional Water Quality Control Board (RWQCB) to treat 5.5 MGD. Using permitted capacity as the *actual maximum capacity* results in the City of Shafter owning 1.8 MGD of WWTP capacity.

In 2004, an agreement with the City of Bakersfield and the County of Kern was executed. The agreement sets forth the area to be provided sewer service by the City of Bakersfield and NORSRD.

The Study Area boundary reflects the division of NORSD and the City of Bakersfield sewer service areas.

A copy of the JPA Agreement is included in **Appendix A**.

In June 2004, NORSD entered into another agreement under which the City of Shafter's cost is $\frac{1}{4}$ of the total cost of the Shafter Reach (i.e. from Shafter Avenue to the WWTP) and thereby the City of Shafter's capacity in the Outfall Sewer is $\frac{1}{4}$ of the capacity of the Outfall Sewer in 7th Standard Road from Shafter Avenue to Santa Fe Way.

In 2015, NORSD and City of Shafter executed a Cooperative Agreement which stipulated that Shafter will permit NORSD to utilize up to 0.8 MGD of Shafter's excess sewage treatment plant capacity in accordance with NORSD's needs at no cost to NORSD with a sunset date of 1 January 2027. The agreement stated that NORSD will not acquire any ownership interest in the excess capacity by its use of Shafter's excess sewage treatment plant capacity. This Agreement further required Shafter and NORSD shall continue to coordinate and discuss the future needs of the Sewer Facilities under the JPA, and to assess and discuss the status of the borrowed capacity under this Agreement at least once in every twelve month period. Under this agreement Shafter owns one-third of the increased WWTP capacity of 7.5 MGD.

Should the sewer treatment plant's average daily flows reach a combined 6.5 MGD, the two parties shall meet within forty-five (45) days to coordinate future plans for the sewer system. In addition, the two parties agreed to meet within forty-five (45) days when the following occur: (1) Shafter has utilized 0.2 MGD of NORSD's excess sewer collection capacity in the pipeline south of 7th Standard Road; (2) Shafter has utilized 0.4 MGD of NORSD's excess sewer collection capacity in the pipeline south of 7th Standard Road; (3) NORSD has utilized 0.2 MGD of Shafter's excess sewer treatment plant capacity; (4) NORSD has utilized 0.4 MGD of Shafter's excess sewer treatment plant capacity; and (5) NORSD has utilized 0.6 MGD of Shafter's excess sewer treatment plant capacity. A copy of this Agreement is also included in Appendix A. Currently Shafter has 1.7 MGD ($7.5/3$ minus 0.8) of capacity in the treatment plant until 1 January 2027 when Shafter's capacity reverts back to 2.5 MGD ($7.5/3$). As of January 2018, Shafter's influent flow was 1.23 MGD.

In summary, NORSD expanded its service area substantially in the last 25 years. Continued growth in the number of sewer connections served is anticipated. In light of the expected growth of the District's service area and potential significant increase in the sewage that the District will need to convey, treat, and dispose of, preparation of this Master Plan Update was authorized.

Furthermore, with the passage of California's Sustainable Groundwater Management Act in 2014 (SGMA), NORSD recognizes the potential increase in value of the treated effluent for higher reuse. While planning for treatment and resale of the effluent is beyond the scope and timeframe of this Update, it is none the less noted as a long term goal of NORSD to realize this future source of revenue.

1.3 Objectives of the Master Plan Update

The objectives of the Master Sewer Plan Update are to:

- a) Assess the current needs for improvements to the District’s sewage collection and treatment systems;
- b) Investigate the future needs of the District’s sewage collection system and treatment plant through year 2030;
- c) Review and update the Plan for “build-out” of the Study Area assuming land use will be as described in the Metropolitan Bakersfield General Plan, specifically in accordance with the land use plan.
- d) Update the conceptual plan for conveyance and treatment of municipal sewage and disposal of the undisinfected secondary effluent produced by the wastewater treatment plant.
- e) Develop opinions of their present day (2018) construction costs.

This Master Sewer Plan Update has been developed to year 2030.

1.4 Topography and Climate

The topography east of Hwy 99 around Oildale slopes up gently to the northeast. The topography west of Hwy 99 is generally flat and essentially level with very small changes in elevation either north to south or east to west. West of Enos Lane, the natural ground is essentially level in some areas. The ground surface elevations within the Study Area range from 325 feet above sea level (ASL) in the southwest to 740 feet ASL in the northeast.

The climate is typical of the San Joaquin Valley with hot, dry summers and cool winters. Summer temperatures often exceed 100 degrees F. Winter temperatures vary from 40 to 60 degrees F, with night and morning ground fog and occasional frosts. Average precipitation is 6 to 7 inches annually, most occurring between November and April. Evaporation totals over 5 feet per year, the majority of which occurs from May through October. The predominant winds during the summer are from the northwest at less than 10 miles per hour. Winter winds are roughly opposite, from the southeast with slightly lower velocities. Occasional high winds produce dust storms that impact the area.

1.5 Methodology

Future development within the existing service area is evaluated based on build-out conditions of 89,060 single family residence equivalents. This total build out was described in the District’s 2013 Master Sewer Plan.

It is District policy that developers are responsible to design and construct any facilities necessary to serve their development. As a result only the trunk sewer pipeline and treatment improvements have been evaluated as part of this master plan update. Improvements have been recommended to meet the needs of future development within the planning horizon.

The District’s sanitary sewer collection system was hydraulically modeled using the Sewer Gems software.

1.6 Road Names Used

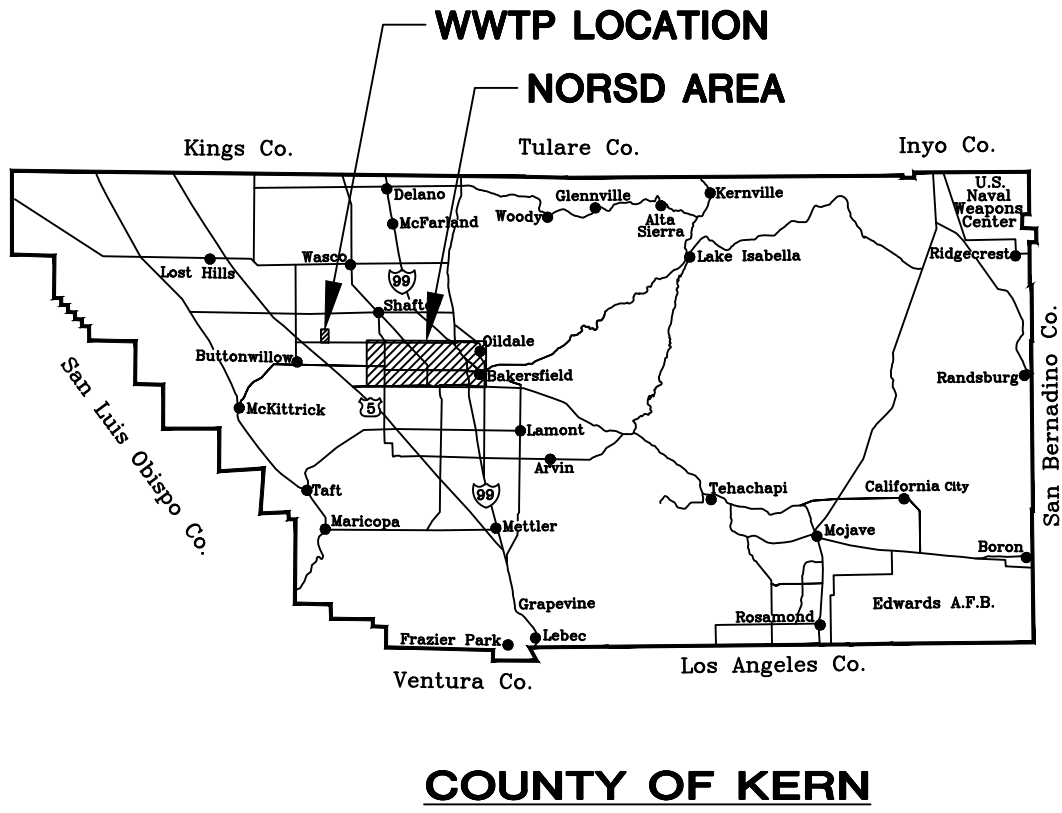
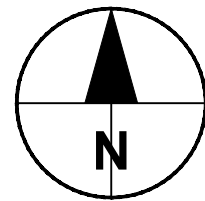
Road names are used throughout this report to indicate sewer alignments and locations of other sewerage facilities being discussed. For ease of reference, the east-west roads in the Study Area are referred to by the road name in Oildale that is most likely familiar to the reader. For example, Decatur/Olive/Reina is simply referred to as Olive Drive.

1.7 Additional Studies

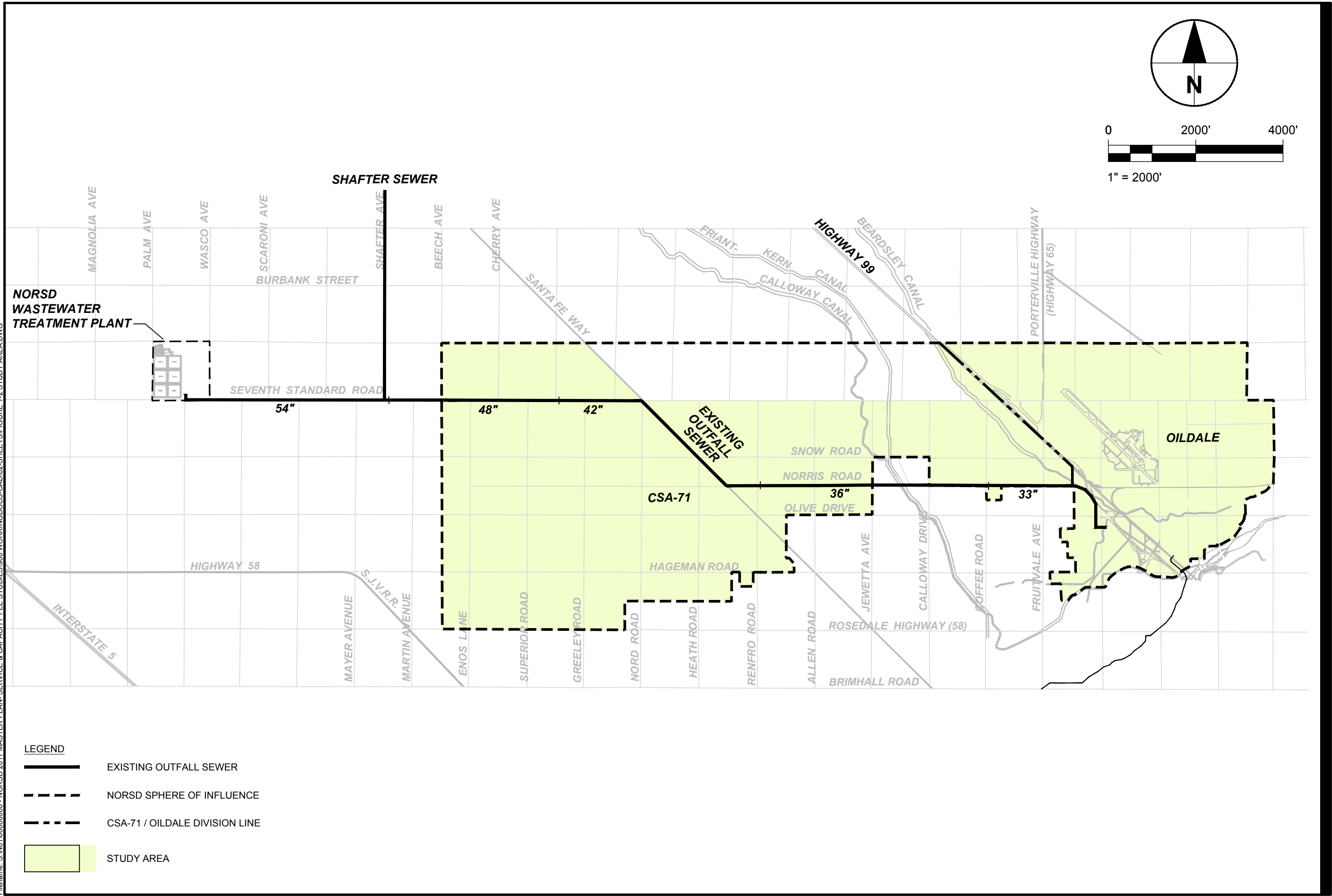
The following studies were referenced in preparation of this master plan update.

- *Master Sewer Plan*. February 2013. AECOM.
- *Wastewater Treatment Alternatives Report*. December 2009. AECOM.
- *CSA-71 Sewer Master Plan (Northwest Bakersfield Urban Area)*. November 2003. Quad Knopf. (The draft 2010 and 2016 CSA 71 Master Plans were never adopted by Kern County nor City of Bakersfield.)

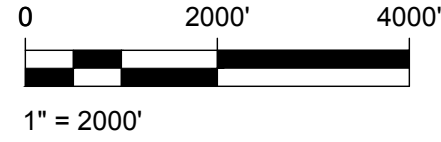
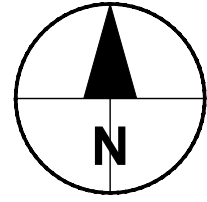
Last saved by: GABRIEL ROSALES(2018-02-21) Last Plotted: 2018-03-15
 Project Management Initials: Designer: _____ Checked: _____ Approved: _____
 ANS I A 8.5" x 11"
 Filename: S:\N01\00000000 - NORSD 2017 MASTER PLAN - SERVICE & CAPACITY FEE STUDIES\900 WORKINGDOCS-CAD\02-SHEETS\FIGURE 1-1 VICINITY MAP.DWG



COUNTY OF KERN



- LEGEND**
- EXISTING OUTFALL SEWER
 - NORSD SPHERE OF INFLUENCE
 - CSA-71 / OILDALE DIVISION LINE
 - STUDY AREA



STUDY AREA

Section 2

Existing Facilities

2.1 Outfall Sewer Capacity Rights

NORSRD constructed and funded most of the cost of the Outfall Sewer. Under terms of the 1990 JPA (NORSRD, CSA-71 [Kern County], and City of Shafter) and the 1998 NORSRD/City of Shafter Agreement, the current capacity rights in the Outfall Sewer are shown in **Table 2-1**.

The City of Shafter conveys wastewater from the City of Shafter through two connections into the Outfall Sewer at Shafter Avenue and the other is at Santa Fe Way and 7th Standard Road. The connecting sewers are owned by the City of Shafter.

Table 2-1 Average Day Flow Outfall Sewer Capacity Rights

Outfall Sewer Reach	NORSRD	CITY OF SHAFTER	TOTAL
Norris Road--East of Jenkins Road	9	0	9
Santa Fe Way—Norris Road to 7 th Standard Road	9	0	9
7 th Standard Road--Santa Fe Way to Shafter Avenue	9	3	12
7 th Standard Road--Shafter Avenue to WWTP	9	3	12

2.2 Collection System

The collection system consists of approximately 174-miles of sewers ranging from 6-inch to 54-inch and five lift stations. The collection system is broken down in **Table 2-2**. Additionally the system includes approximately 3,236 manholes and cleanouts by line size and serves approximately 23,400 active sewer connections plus the outfall from the City of Shafter.

Table 2-2 Collection System Summary

Sewer Diameter	Length (ft.)
6-inch	18,074
8-inch	607,711
10-inch	59,470
12-inch	43,635
14-inch	1,440
15-inch	43,815
16-inch	23
18-inch	10,009
21-inch	7,645
24-inch	15,738
27-inch	6,621
30-inch	5,192
33-inch	16,648
36-inch	21,695
42-inch	23,806
48-inch	13,631
54-inch	23,781

All system collector and interceptor sewers, as well as City of Shafter trunk sewer, drain to the Outfall Sewer. **Figure 2-1** illustrates the sewer design and layout. **Figure 2-2** illustrates the capacities of the Outfall Sewer by reach based on the design criteria for the Outfall Sewer listed in Section 7. (The hydraulic capacity of each reach of the Outfall Sewer flowing full is greater than the design capacities listed on Figure 2-2.) The Outfall Sewer discharges at the WWTP. The five lift stations in the collection system are listed in **Table 2-3**.

Table 2-3 Collection System Lift Stations

Lift Station No.	Location	No. of Pumps	Pump Capacities (gpm)
1	S. Oildale Dr & Huskey Dr	3 (2 Speed)	850/1200; 850/1200; 850/1200;
2	Olive Dr & Mohawk St	2	810; 810
3	Spectrum Parkway (at rear of Barry's RV)	2	300; 300
4	Mohawk St & Krebs Rd.	3	990; 990; 600
5	Wegis Ave & Hageman Rd	2	480; 480

2.3 Wastewater Treatment Plant Capacity Rights

The WWTP was constructed on a section of land owned by NORSD. After the original WWTP was permitted for 5.50 MGD, the City of Shafter purchased one-third of the WWTP's capacity (1.83 MGD). The remaining 3.67 MGD was owned by NORSD.

Improvements were made to the WWTP over the years. As a result, the WWTP's permitted capacity was increased to 7.5 MGD.

Shafter contributed to the cost of the improvements to maintain their ownership of 1/3 capacity of the WWTP.

The average day capacity rights in the existing WWTP are vested as follows:

- NORSD = 5.0 MGD
- City of Shafter = 2.5 MGD
- Total = 7.5 MGD

2.4 Wastewater Treatment Plant

The District's wastewater treatment plant (WWTP) is located about six miles west of Enos Lane on 7th Standard Road southwest of the City of Shafter, Section 36, T28S/R24E. The treatment capacity of the District's WWTP is 7.5 MGD and the permitted capacity is 7.5 MGD. Effluent from the WWTP is undisinfected secondary.

Figure 2-3 is a layout of the existing WWTP. **Figure 2-4** is a flow schematic of the existing wastewater treatment process. The plant has been in operation since 1999.

The original WWTP process included the following "unit processes":

1. Headworks with;
 - a) Two mechanical bar screens,
 - b) Lift station,
2. One primary clarifier;
3. One plastic media trickling filter;
4. One secondary clarifier;
5. Two anaerobic digesters operating in series; and,
6. 14 unlined sludge drying beds.

Several significant improvements were later added:

- In 2002, degritting facilities were added.

- In 2005, a cogeneration plant was installed utilizing the anaerobic digester gas to heat the digesters and produce power using microturbines. Currently, the cogeneration plant is not operable.
- In October 2006, a ferric chloride (FeCl₃) chemical feed system was installed to allow injection of this chemical into the influent ahead of the primary clarifier.
- In January 2008, a polymer feed system was installed to supplement the FeCl₃ feed system.
- In 2013, a screw press was added to dewater the sludge.
- In 2017, a new trickling filter rotary distributor was installed and the two 2500 gpm constant speed pumps in the headworks raw water pump station were replaced.

2.5 Effluent Storage

Currently there are four unlined effluent storage ponds with a total storage volume of approximately 1,488 AF (372 AF per pond). Only the two northerly ponds (Nos. 1 and 3) are actively used for effluent storage. The other two ponds are used for emergency storage only. The four ponds cover approximately 160 acres total and 32.5 acres each. **Figure 2-5** shows the layout of the ponds relative to the treatment plant.

2.6 Effluent Disposal

Treated effluent is currently used for irrigation of feed and fodder crops. The permitted effluent disposal area covers 2,500 acres. Of this amount, 1,860 acres are owned by local farmer Sill Properties Inc. (Sill) and 640 acres are owned by NORSD, see **Figure 2-6**. Sill currently takes all of the treated effluent that is not percolated or evaporated from the storage ponds. In 2017, up to 1588 acres were irrigated during a given month with undisinfected secondary effluent from the treatment plant. The maximum acreage of feed and fodder crops irrigated with effluent during any given month in 2017 is as follows:

1. 621 acres of alfalfa;
2. 566 acres of wheat; and,
3. 401 acres of corn.

4,023 acre-ft. of treated effluent was used for irrigation of feed and fodder crops in 2017.

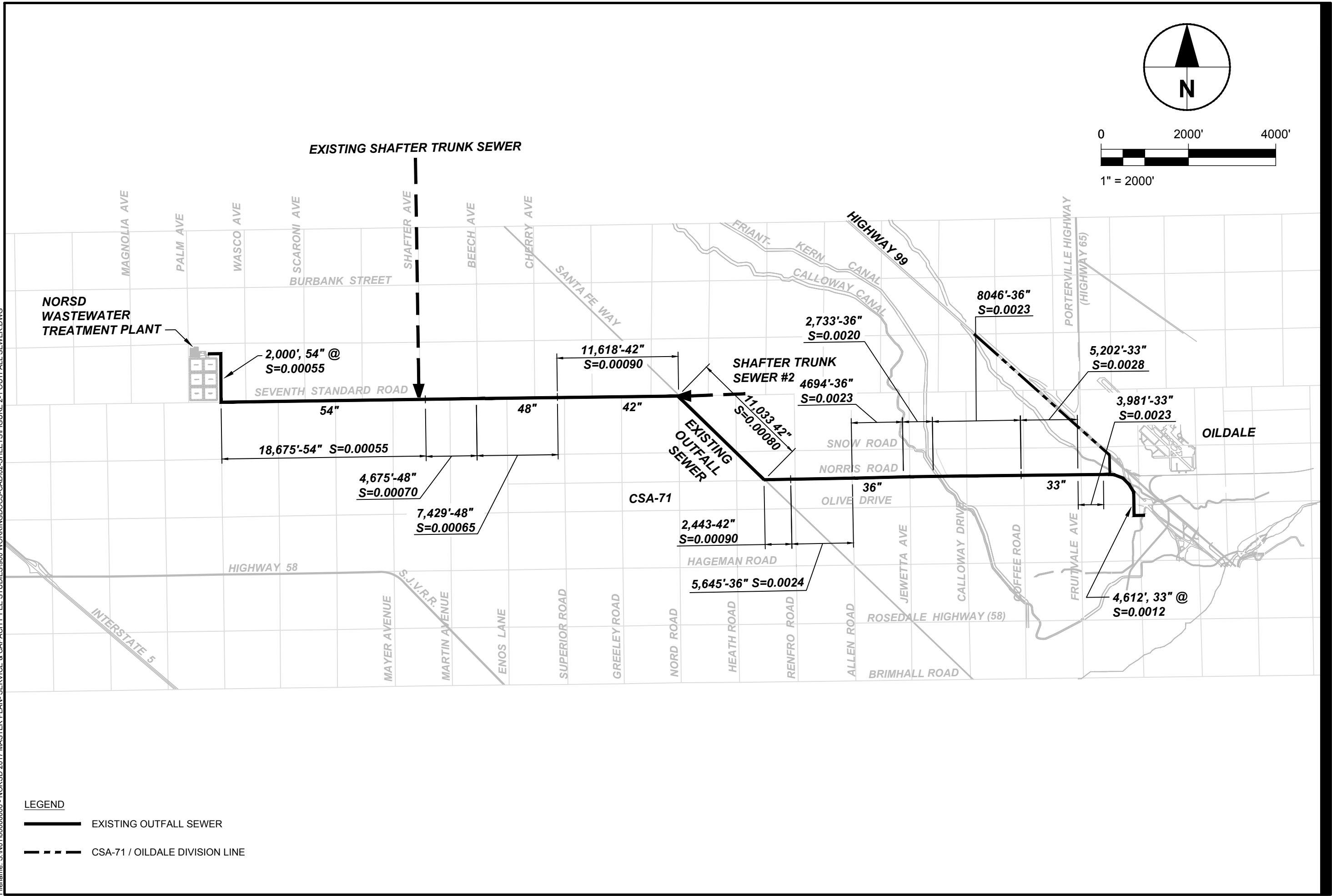
These uses are consistent with allowable Title 22 uses and the Waste Discharge Requirements (WDR). The District's current WDR (Order No. R5-2011-0011, adopted February 3, 2011) is included in **Appendix B**.

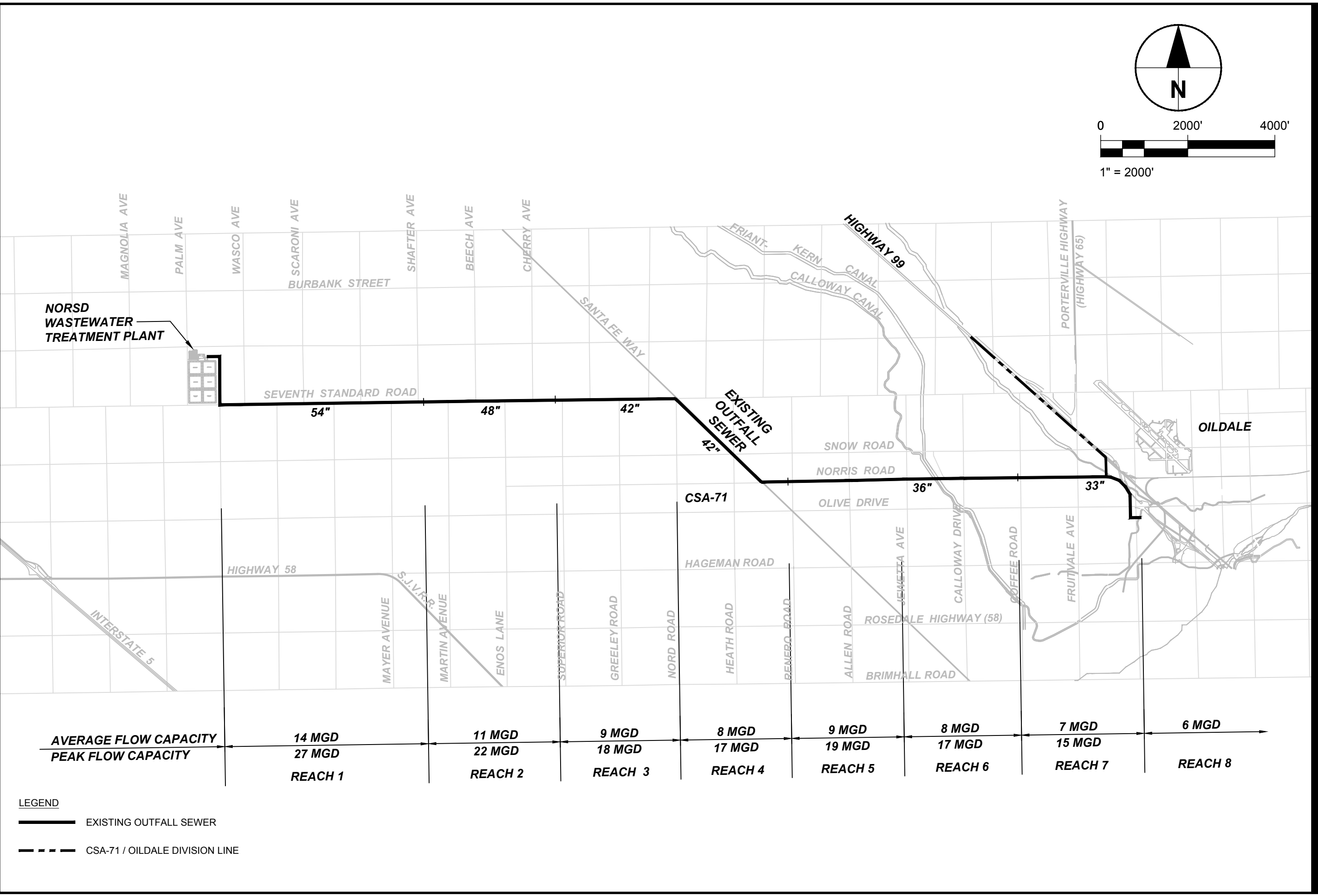
2.7 Sludge Disposal

The WWTP has 14 sludge drying beds: 3 lined and 11 unlined. Dewatered sludge is stored in 2 lined sludge drying beds. A third lined bed is used for emergency storage of biosolids only. The

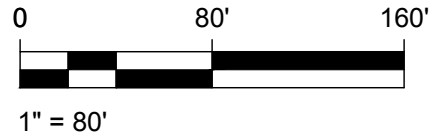
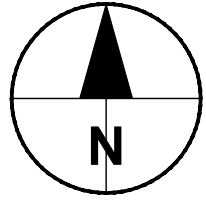
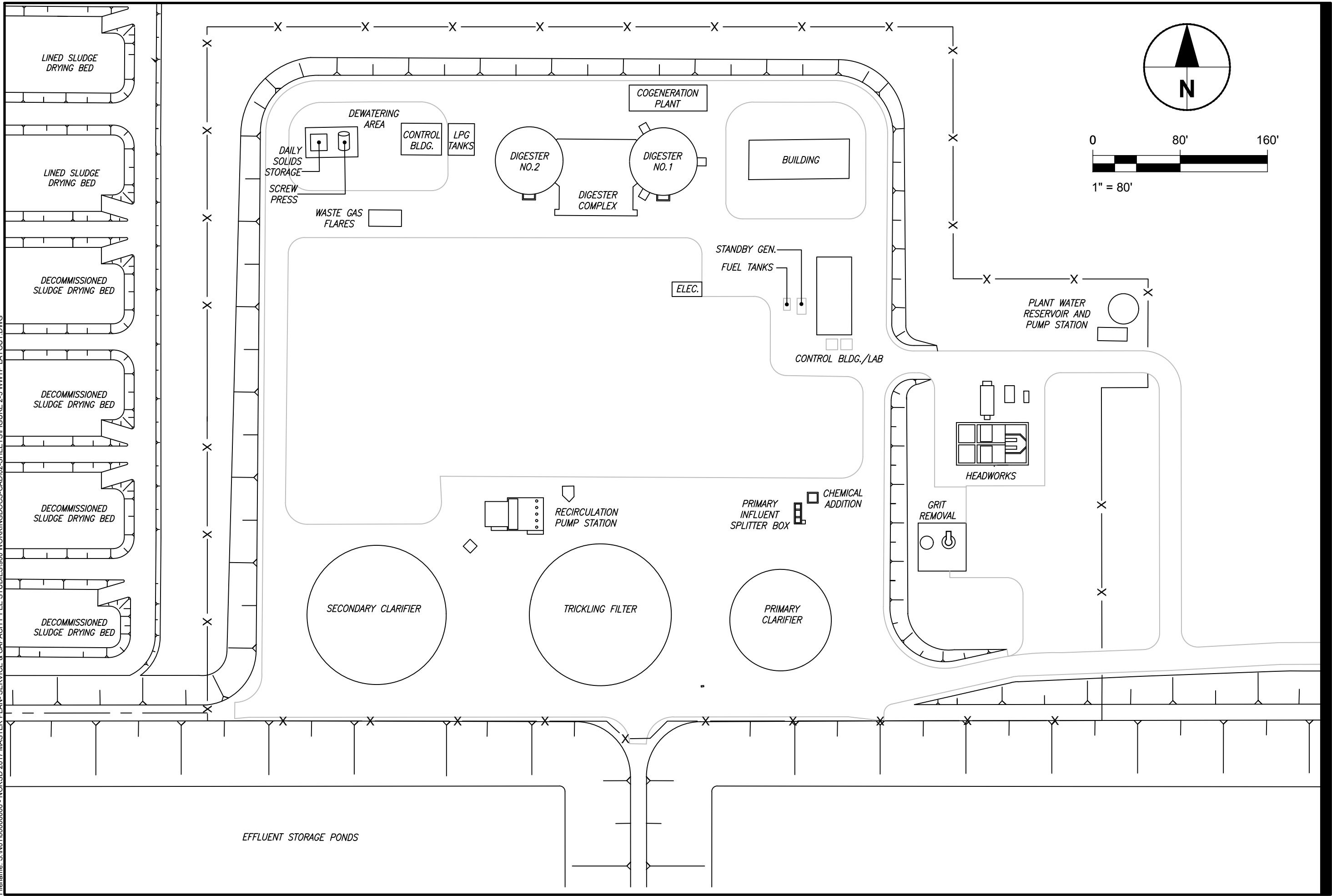
remaining 11 unlined beds have been decommissioned are no longer used, nor permitted for storage of sludge. The 14 beds cover approximately 12.5 acres total and 0.9 acres each.

After drying, sludge from the drying beds is currently applied to 125 permitted acres of the agricultural land owned by NORSD for use as a soil amendment. In 2018, NORSD will make application to the RWQCB to allow application of biosolids to the remaining farm acreage owned by NORSD.



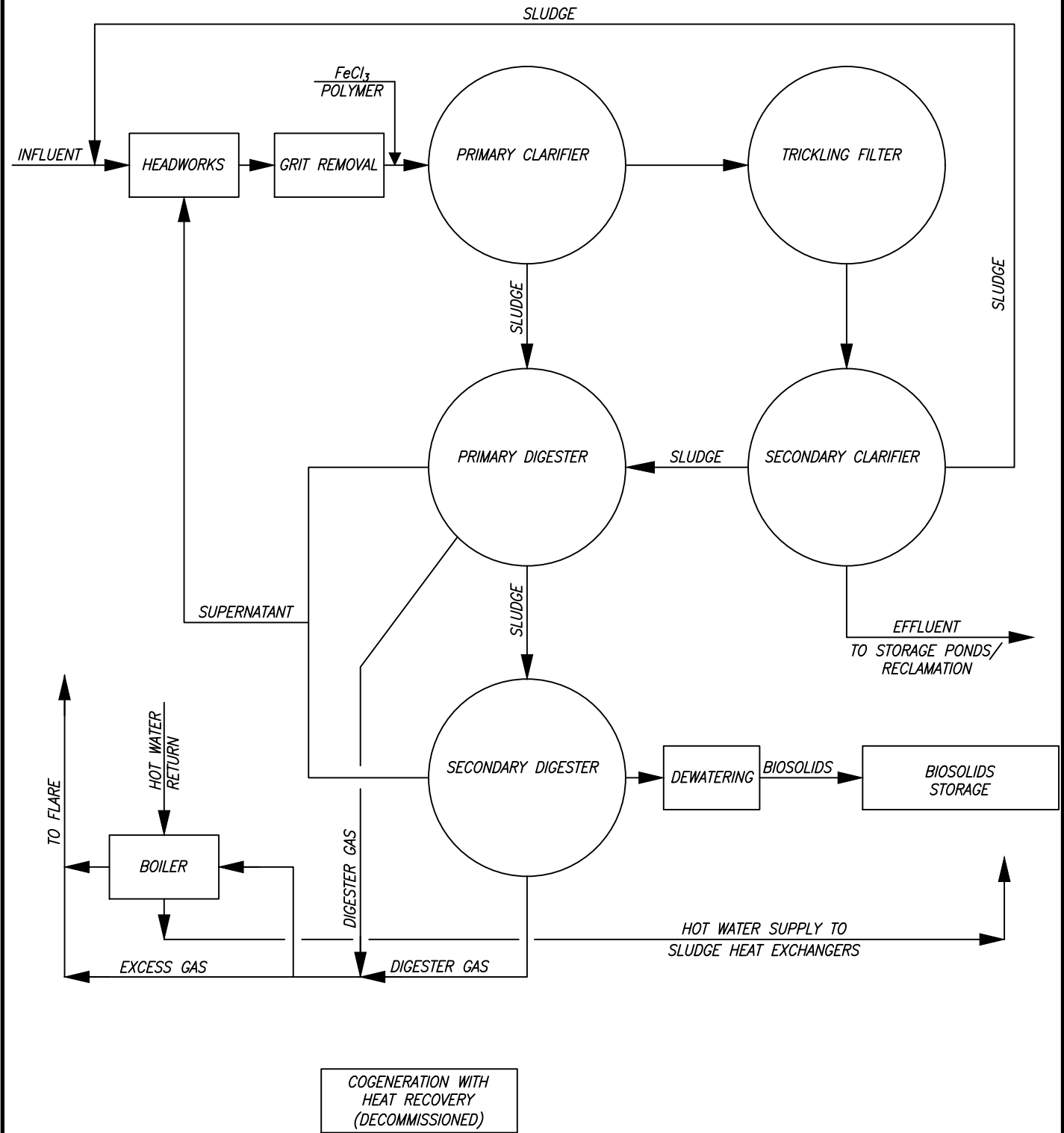


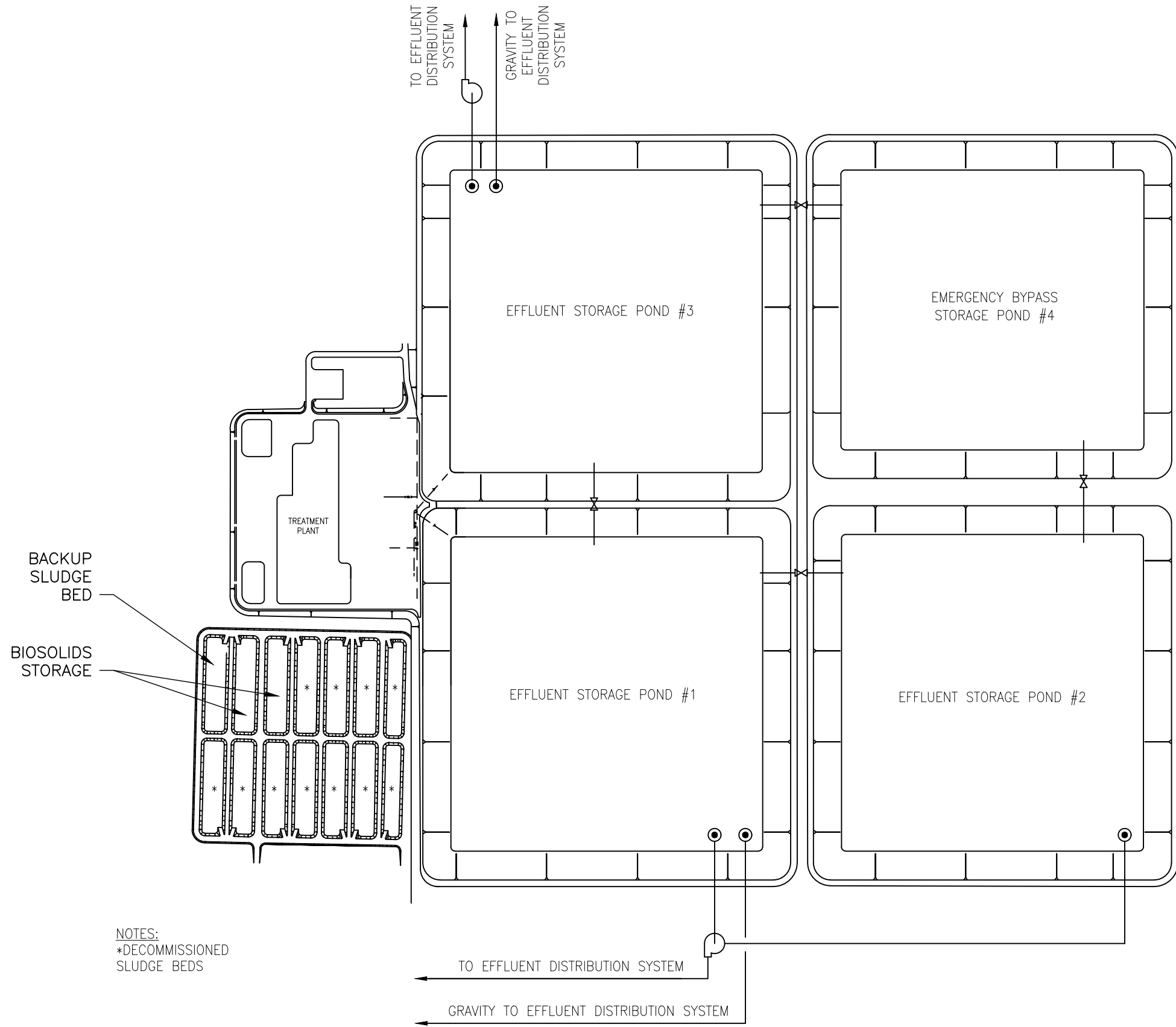
Last saved by: GABRIEL ROSALES(2018-03-23) Last Plotted: 2018-03-23
Filename: S:\010000000 - NORSD 2017 MASTER PLAN - SERVICE & CAPACITY FEE STUDIES\900 WORKING\DOCS-CAD\02-SHEETS\FIGURE 2-3 WWTP LAYOUT.DWG
Project Management Initials: Designer: Checked: Approved: ANSI B 11" x 17"



WWTP LAYOUT

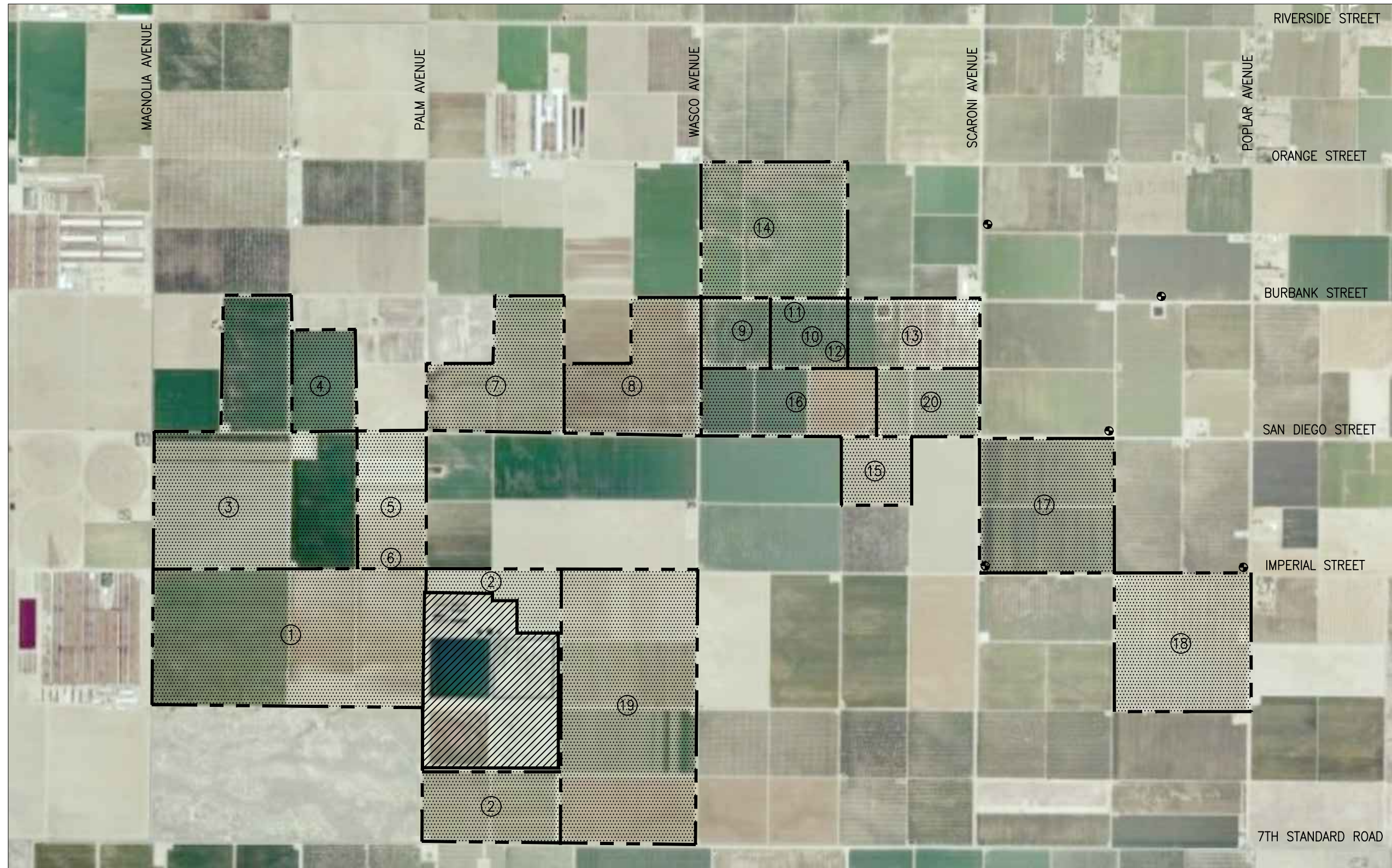
NORTH OF RIVER SANITARY DISTRICT
2018 MASTER SEWER PLAN UPDATE
NORTH OF RIVER SANITARY DISTRICT
Project No.: 60545074 Date: 2018-01-10





NOTES:
 *DECOMMISSIONED
 SLUDGE BEDS

EFFLUENT STORAGE POND LAYOUT

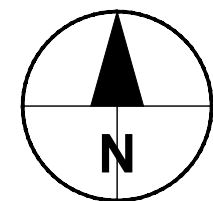
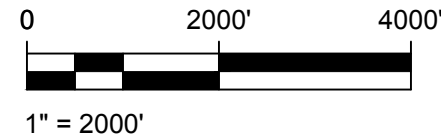


PARCEL ID:

① 088-210-01	⑥ 088-180-07	⑪ 090-240-18	⑯ 090-240-03
② 088-210-06	⑦ 088-180-10	⑫ 090-240-21	⑰ 090-240-17
③ 088-180-02	⑧ 088-180-12	⑬ 090-240-04	⑱ 090-270-07
④ 088-180-34	⑨ 090-240-01	⑭ 090-140-08	⑲ 088-210-05
⑤ 088-180-06	⑩ 090-240-20	⑮ 090-240-08	⑳ 090-240-05

LEGEND:

- ①① PARCEL APN
- PARCELS CURRENTLY PERMITTED FOR USE OF NORSD TREATED WASTEWATER
- NORSD WWTP



PERMITTED RECLAMATION AREA

Section 3

Population & Sewage Flow Projections for Purposes of Conveyance

3.1 Population Projections

Table 3-1 contains a summary of population projections for Oildale and the NORSD areas of CSA-71 and the City of Shafter. The 2017 population information for Oildale and CSA-71 is based on the NORSD 2017 special assessment data and applicable data from the Oildale Mutual Water Company 2015 Urban Water Management Plan. The population information for the City of Shafter came from the California Department of Finance Demographic Research Unit's *Population Estimates for City, County, and State January 1, 2016 and 2017*. The population growth projection of 2% for Oildale and CSA-71 is from the Kern Council of Governments *2018 Regional Transportation Plan*. The population growth projection was increased to 3% for the City of Shafter based on the advice from the City of Shafter.

Table 3-1 Population Projection

Year	Oildale & CSA-71 (2%)	City of Shafter (3%)	Total Population
2017	43,610	18,868	62,478
2020	46,279	20,618	66,897
2025	51,096	23,901	74,997
2030	56,414	27,708	84,122

The population projections presented in **Table 3-1** are used in Section 4 to estimate the timing for expanding the wastewater treatment plant.

3.2 Estimated Sewage Flows at Buildout

The calculation of sewer connection fees (and sewer service charges) in NORSD is based on Single Family Residential Equivalents (SFRE). The 2013 Master Sewer Plan developed and determined the following:

- Numbers of current (2017) and future SFRE that will be served;
- How the gpd/SFRE was determined; and
- Sewage Flows at build-out.

The 2013 Master Sewer Plan calculated flows from Oildale to be 245 gpd per SFRE and 297 gpd per SFRE in CSA 71. For the purpose of estimating flows at full buildout, a flow of 300 gpd/SFRE was used. The following is a summary of those determinations:

Table 3-2 updates the estimates from the 2013 Sewer Master Plan and summarizes the number of additional SFRE that will be connected to the sewer system by the time build-out is reached. The current SFRE as of January 2018 for NORSD totals 20,667 including government and industrial customers. From the District’s assessment rolls, the total SFRE without the government and industrial customers was 18,833. The commercial SFRE was estimated to be 1,466. The residential SFRE was estimated to be 17,326 and there were 41 unassigned SFRE within Oildale on the roll. The total SFRE at build-out remains as determined by the 2013 Master Sewer Plan.

**Table 3-2
SFRE at Build-Out**

Area	Current (2017) SFRE	Additional SFRE by Build-out	Total SFRE At Build-out
Oildale	15,551	10,498	26,049
CSA-71 (Currently Discharging)	5,116	57,895	63,011
TOTALS	20,667	68,393	89,060

3.2.1 Flows per SFRE (gpd/SFRE)

From **Table 3-2**, it is expected that an additional 68,400 SFRE from 2017 will be connected to the sewerage system by the time build out is reached. It is also expected that there will be new developments similar to those that have occurred recently in CSA-71 (and in Oildale).

As established in the 2013 Master Sewer Plan, a flow of 300 gpd/SFRE was used to develop the ultimate flows.

3.2.2 Distribution of Average Day Sewage Flows at Build-Out

Figure 3-1 shows the estimated average day sewage flows expected from each section of land within the Study Area. The flows are in MGD and were calculated by multiplying the projected number of SFRE for each section per the Metropolitan Bakersfield General Plan. The flows shown in the figure are based on 300 gpd/SFRE.

3.2.3 Sewage Flow at Build-Out

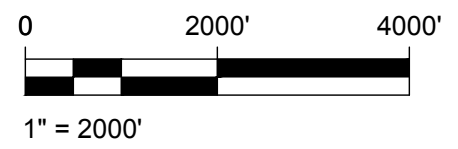
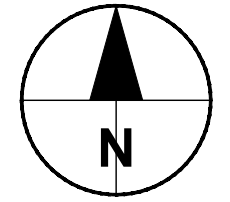
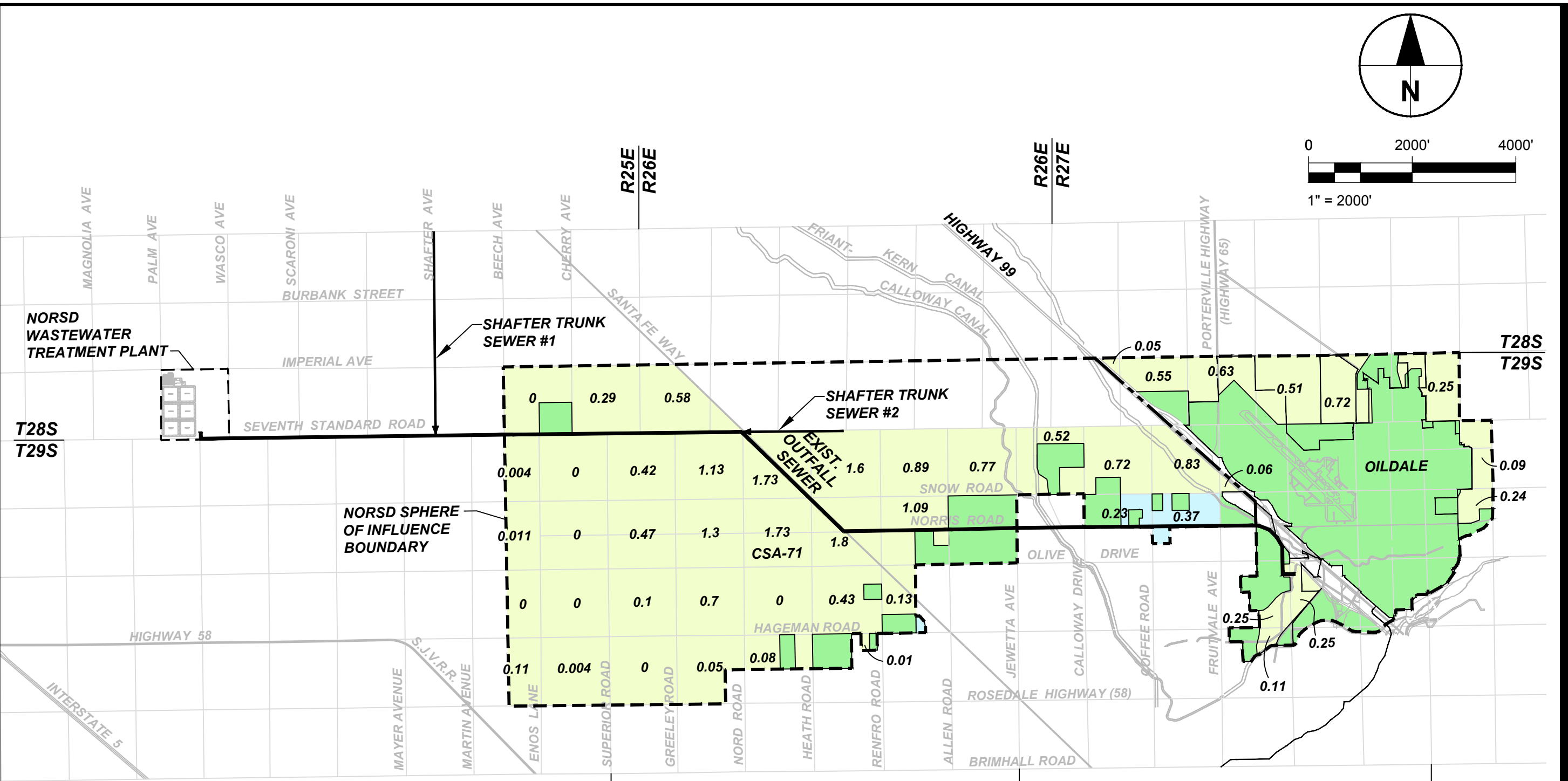
Table 3-3, taken from the 2013 Master Sewer Plan, shows the estimated sewage flows when build-out is reached assuming a flow of 300 gpd/SFRE. The average 2017 flow is roughly the same as it was in 2013. However, the number of SFRE has increased since 2013 by 3607 from 17,060 to 20,667. Part of this increase in SFRE is due to growth, however a substantial number of SFRE have been added to the tax rolls as a result of the effort of NORSD staff to find unenrolled property receiving service. Increased conservation due to the drought has also kept flows down.

The City of Shafter “owns” 3 MGD of capacity in the Outfall Sewer. As noted previously, flows from City of Shafter exceeding 3 MGD average day will be conveyed to the WWTP in sewers to be funded and constructed by the City of Shafter.

Therefore, **Table 3-3** limits the build-out flow from Shafter to 3.0 MGD only for the purpose of sewer conveyance. It is noted that the total estimated average day flow of 27.6 MGD is less than was estimated in the 2013 Sewer Master Plan. Again, the increase in existing SFRE and ongoing conservation are the source of this decrease. Of course this total may increase in the future as NORSD grows or annexes additional service area.

**Table 3-3
Estimated Sewage Conveyance Flows at Build-Out
(MGD)**

Contributor	Anticipated New SFRE at Build-out	Increase in Average Day Flow (MGD)	2017 Average Day Flow (MGD)	Total Estimated Average Day Flow at Build-out (MGD)
Oil Dale	10,498	3.1	3.1	6.2
CSA-71	57,895	17.4	1.0	18.4
City of Shafter	--	1.6	1.4	3.0
Totals	68,393	22.1	5.5	27.6



LEGEND

- 0.011** ESTIMATED AVERAGE DAY FLOW (MGD), TYP
- EXISTING OUTFALL SEWER
- CSA-71 / OILDALE DIVISION LINE
- UNDEVELOPED
- DEVELOPED AS OF 2010, CONNECTED TO DISTRICT SEWER
- DEVELOPED AS OF 2010, NOT CONNECTED TO DISTRICT SEWER

ESTIMATED ULTIMATE SEWAGE FLOWS

NORTH OF RIVER SANITARY DISTRICT
 2018 MASTER SEWER PLAN UPDATE
 NORTH OF RIVER SANITARY DISTRICT
 Project No.: 60545074 Date: 2018-01-10

Section 4

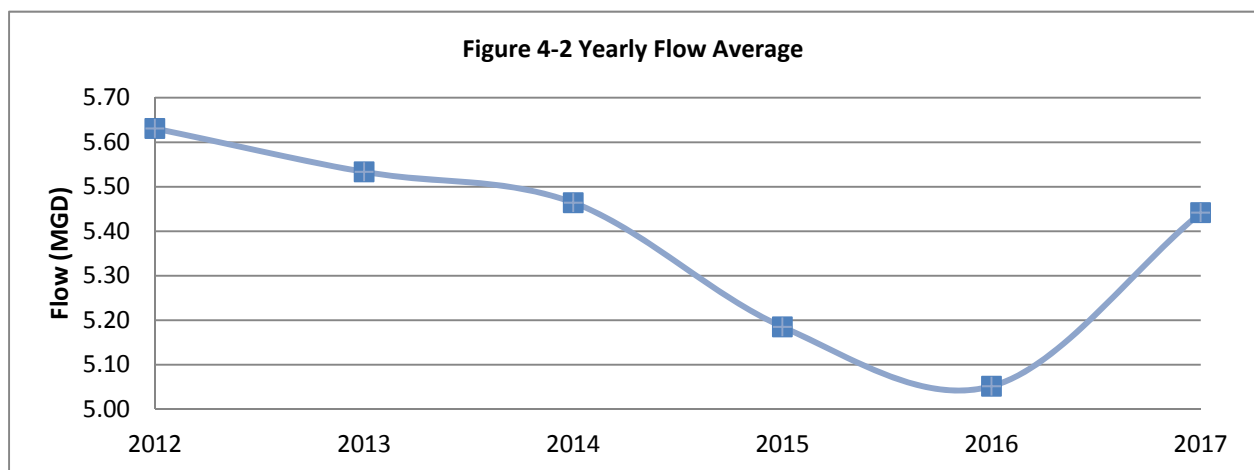
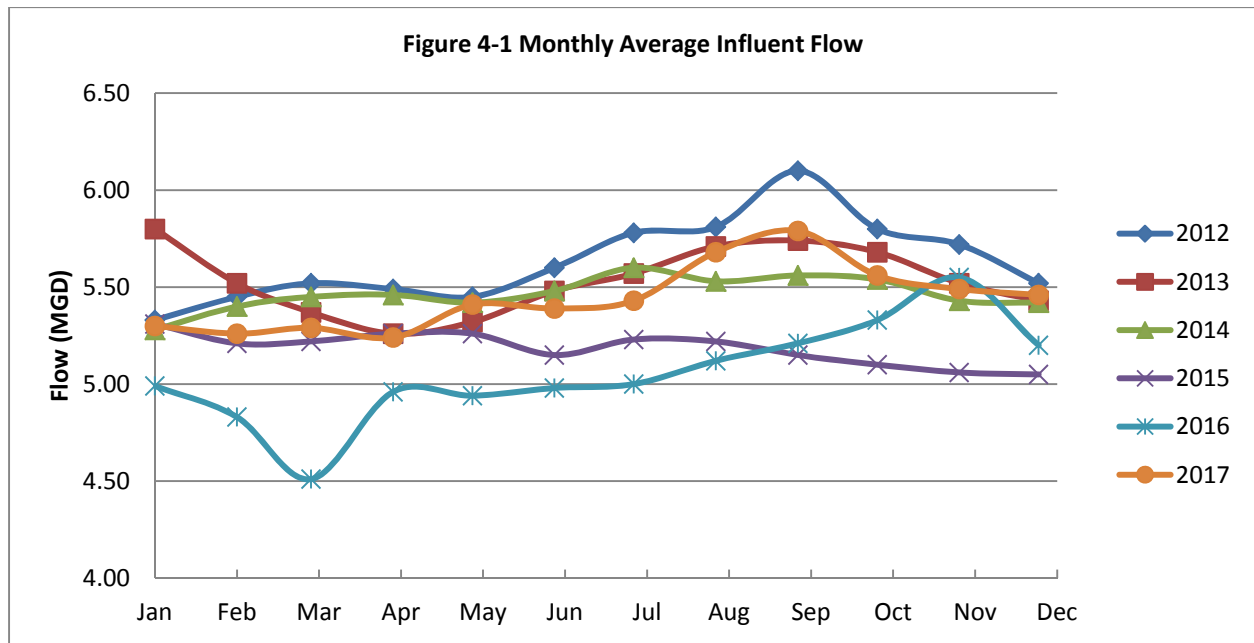
Wastewater Characteristics at WWTP

4.1 Influent Wastewater Flow

Average influent flow into the WWTP between 2012 and 2017 is summarized in **Table 4-1**. **Figures 4-1 and 4-2** illustrate graphically the monthly average influent flow and yearly flow average. The mean average flow during this period is 5.38 MGD.

Table 4-1 Average Influent Flows

Month	Monthly Average Influent Flow (MGD)					
	2012	2013	2014	2015	2016	2017
January	5.33	5.80	5.28	5.31	4.99	5.30
February	5.45	5.52	5.40	5.21	4.83	5.26
March	5.52	5.37	5.45	5.22	4.51	5.29
April	5.49	5.26	5.46	5.26	4.96	5.24
May	5.45	5.32	5.42	5.26	4.94	5.41
June	5.60	5.48	5.48	5.15	4.98	5.39
July	5.78	5.57	5.60	5.23	5.00	5.43
August	5.81	5.71	5.53	5.22	5.12	5.68
September	6.10	5.74	5.56	5.15	5.21	5.79
October	5.80	5.68	5.54	5.10	5.33	5.56
November	5.72	5.52	5.43	5.06	5.55	5.49
December	5.52	5.43	5.42	5.05	5.20	5.46
Yearly Average	5.63	5.53	5.46	5.19	5.05	5.44



Using the 2017 population, the average sewage flow from all customers (including industrial, within NORSD but not Shafter) would be approximately 87 gallons per capita per day (gpcd). **Table 4-2** summarizes flow projections assuming sewage flow per capita remains constant over time. This unit flow is conservative as replacement of older fixture units (toilets, shower heads, faucets, etc.) with new, water efficient models required by California regulations might continue to decrease unit flow over time. Peak flows at the WWTP are estimated using a peaking factor (PF) of 2.0, based on the original design criteria. The 2.0 PF is less than the collection system PF of 3.0 established in the NORSD design standards. The 3.0 PF is typical of a local collection system but by the time the flows reach the WWTP, the various localized peaks have smoothed out and reduced to approximately a 2.0 PF.

Table 4-2 Wastewater Flow Projection

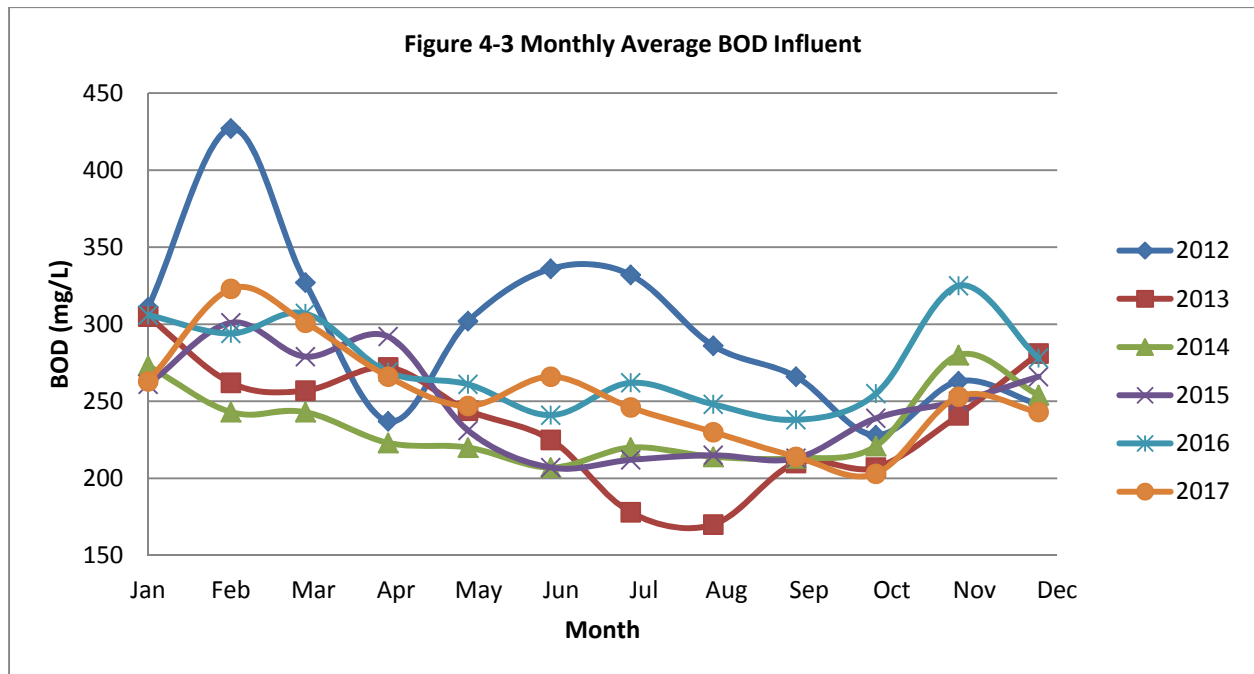
Year	Population	Demand (gpcd)	Projected Average Flow (MGD)	Projected Peak Hour Flow (MGD, PF = 2.0)
2017	62,478	87	5.44	10.88
2020	66,897	87	5.82	11.64
2025	74,997	87	6.52	13.04
2030	84,122	87	7.32	14.64

4.2 Biological Oxygen Demand

As part of its monitoring program, the District tests for the strength of the wastewater entering the treatment plant on a weekly basis. The strength is measured using the 5-day Biochemical Oxygen Demand (BOD₅) standard. This standard represents the amount of oxygen required to meet biological and chemical requirements in a controlled environment over a five-day period and is the basis for assessing treatment performance for permitting compliance. Sampling data at the plant for the past six years (2012 to 2017) indicates that influent loading fluctuated between 207 and 427 milligrams per liter (mg/L) on a monthly basis and averaged 258 mg/L for this period (see **Table 4-3**). **Figure 4-3** graphically illustrates the monthly average influent BOD over the previous six years. This range of concentrations is considered medium strength compared to other utilities.

Table 4-3 Average Monthly Influent BOD₅

Month	Monthly Average Influent BOD ₅ (mg/L)					
	2012	2013	2014	2015	2016	2017
January	311	305	273	261	306	263
February	427	262	243	301	294	323
March	327	257	243	279	307	301
April	237	272	223	292	269	266
May	302	244	220	231	261	247
June	336	225	207	207	241	266
July	332	178	220	212	262	246
August	286	170	214	215	248	230
September	266	210	213	213	238	214
October	228	207	221	239	255	203
November	263	241	280	250	325	253
December	248	281	254	266	278	243
Yearly Average	297	238	234	247	274	255

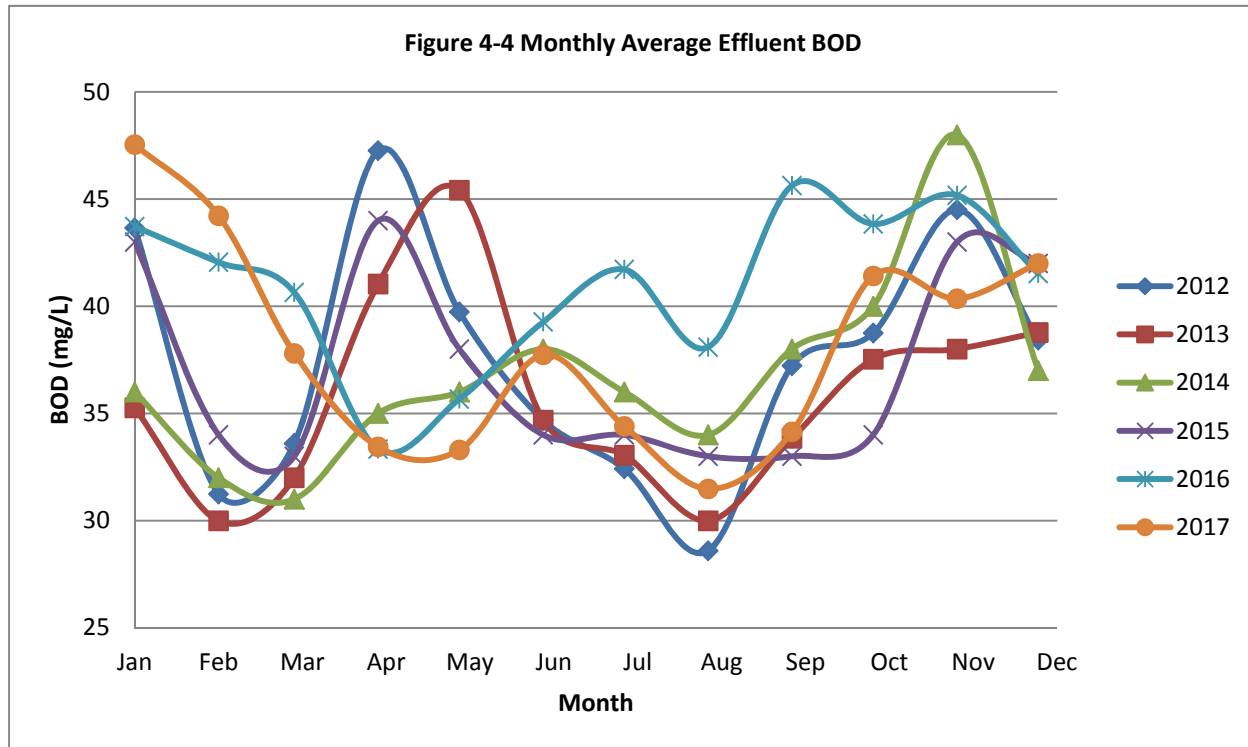


The WDRs require the WWTP to provide for BOD₅ removal efficiency of 80% or to a maximum of 40 mg/L, whichever is more restrictive. Based on the monthly average mg/L of BOD₅, reduction to 40 mg/L is the applicable standard. **Table 4-4** shows the monthly average effluent BOD₅. **Figure 4-4** graphically illustrates the monthly average effluent BOD over the previous 6 years.

Table 4-4 Average Monthly Effluent BOD₅

Month	Monthly Average Effluent BOD ₅ (mg/L)					
	2012	2013	2014	2015	2016	2017
January	44	35	36	43	44	48
February	31	30	32	34	42	44
March	34	32	31	33	41	38
April	47	41	35	44	33	33
May	40	45	36	38	36	33
June	35	35	38	34	39	38
July	32	33	36	34	42	34
August	29	30	34	33	38	31
September	37	34	38	33	46	34
October	39	38	40	34	44	41
November	45	38	48	43	45	40

December	38	39	37	42	42	42
Yearly Average	38	36	37	37	41	38



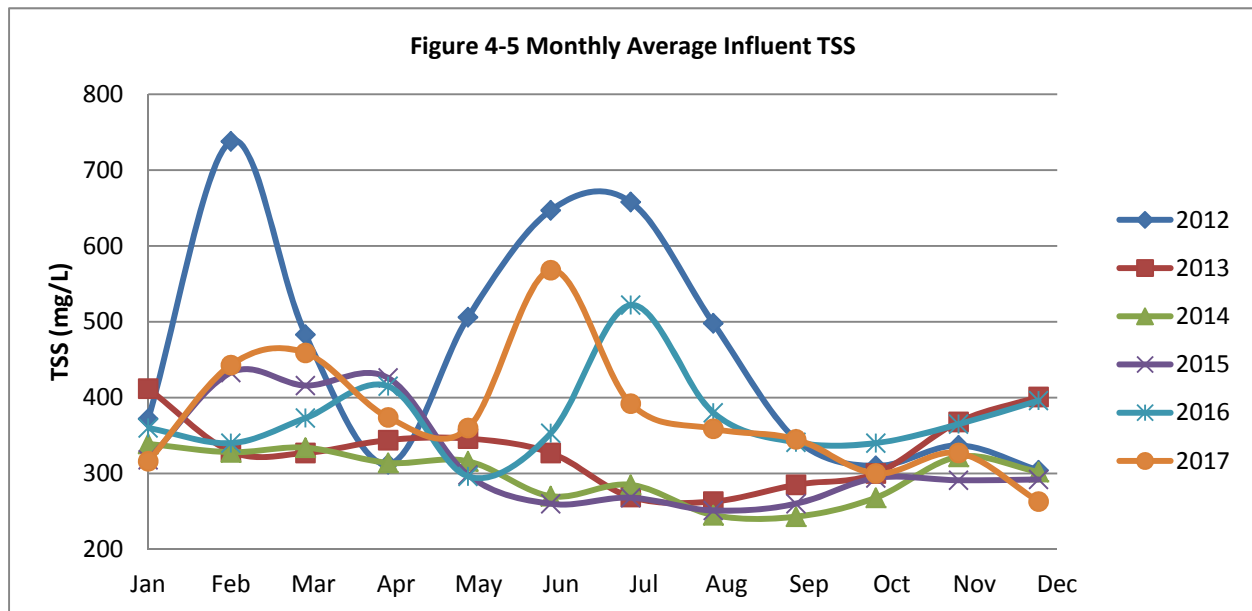
4.3 Total Suspended Solids

As part of its monitoring program, the District tests for Total Suspended Solids (TSS) entering the treatment plant on a weekly basis. Sampling data at the plant for the past six years (2012 to 2017) indicates that influent loading fluctuated between 243 and 738 milligrams per liter (mg/L) on a monthly basis and averaged 360 mg/L for this period (see **Table 4-5**). **Figure 4-5** graphically illustrates the monthly average influent TSS over the previous six years. This range of concentrations is considered high strength compared to other utilities.

Table 4-5 Average Monthly Influent TSS

Month	Monthly Average Influent TSS (mg/L)					
	2012	2013	2014	2015	2016	2017
January	372	412	339	318	360	316
February	738	329	328	433	340	443

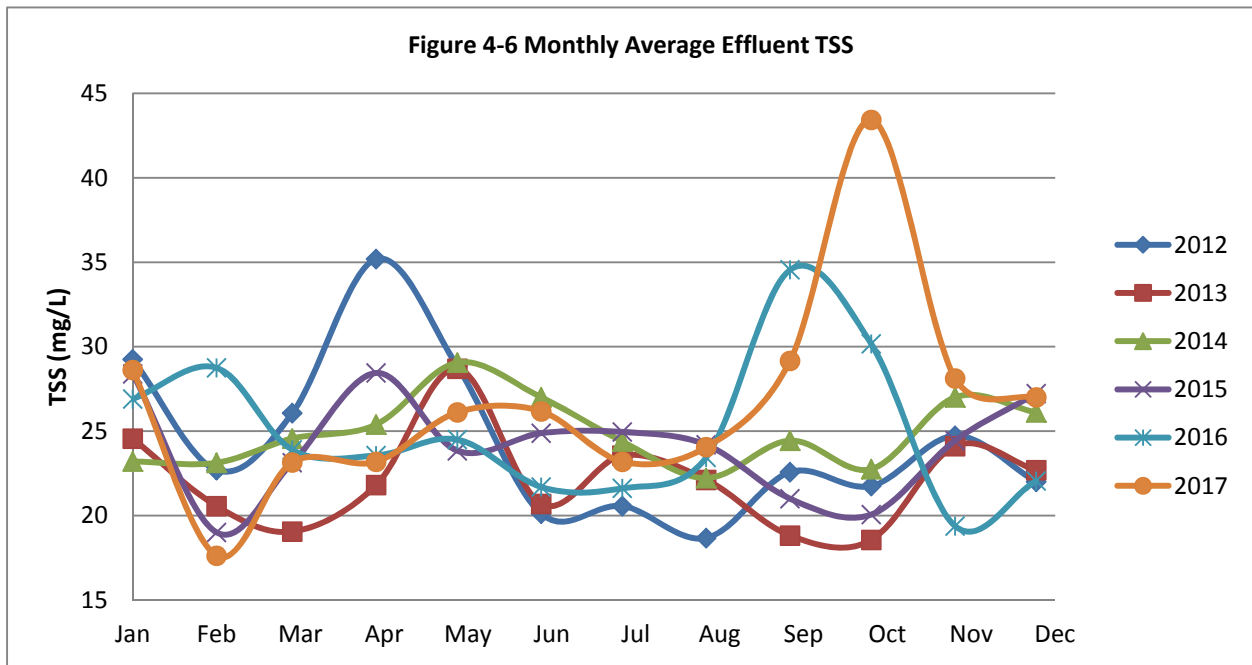
March	483	327	334	416	373	459
April	312	344	314	426	415	374
May	506	346	316	298	296	360
June	647	327	270	260	353	568
July	658	269	285	268	522	392
August	498	263	245	251	380	359
September	345	285	243	260	341	345
October	310	300	268	294	340	300
November	337	368	322	291	365	327
December	304	401	302	292	396	263
Yearly Average	459	331	297	317	373	376



The WDRs require the WWTP to provide for TSS removal efficiency of 80% or to a maximum of 40 mg/L, whichever is more restrictive. Based on the monthly average mg/L of TSS, reduction to 40 mg/L is the applicable standard. **Table 4-6** shows the monthly average effluent TSS. **Figure 4-6** graphically illustrates the monthly average effluent TSS over the previous 6 years.

Table 4-6 Average Monthly Effluent TSS

Month	Monthly Average Effluent TSS (mg/L)					
	2012	2013	2014	2015	2016	2017
January	29	25	23	28	27	29
February	23	21	23	19	29	18
March	26	19	25	23	24	23
April	35	22	25	28	24	23
May	29	29	29	24	25	26
June	20	21	27	25	22	26
July	21	24	24	25	22	23
August	19	22	22	24	23	24
September	23	19	24	21	35	29
October	22	19	23	20	30	43
November	25	24	27	24	19	28
December	22	23	26	27	22	27
Yearly Average	24	22	25	24	25	27



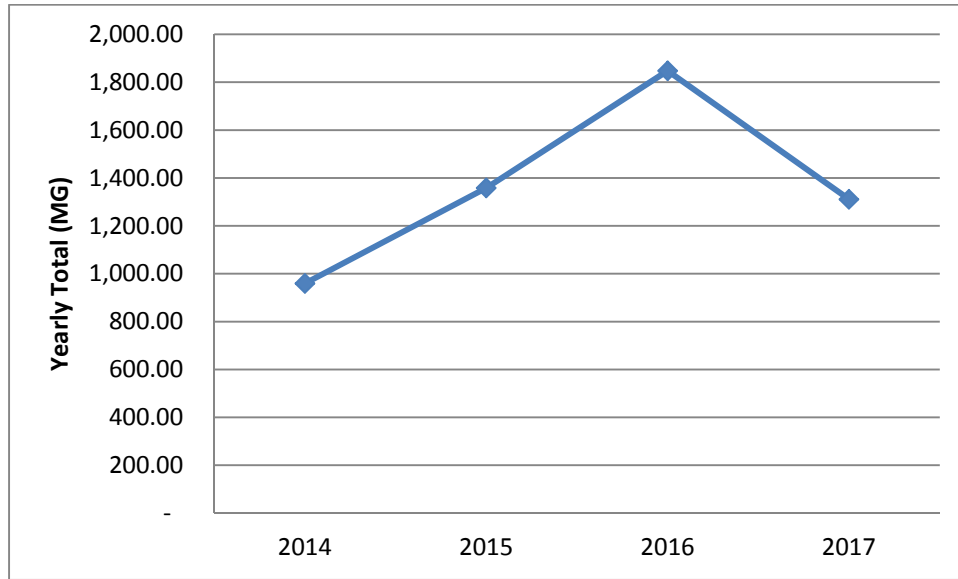
4.4 Effluent Wastewater Flow

Average effluent delivered to Sill between 2014 and 2017 is summarized in **Table 4-7**. The mean average during this period is 3.8 MGD. Effluent deliveries vary based upon Sill irrigation requirements and are generally higher in the summer and lower in the winter. The storage ponds at the WWTP are used to attenuate the variability in deliveries. **Figure 4-7** graphically illustrates the yearly total effluent flows to the reclamation area.

Table 4-7
Average Effluent Flows Delivered for Irrigation

Monthly Average Effluent (MGD)				
Month	2014	2015	2016	2017
January	0.64	2.91	1.22	0.00
February	0.24	3.73	12.31	1.96
March	0.23	2.64	8.82	7.18
April	0.67	4.05	2.76	1.56
May	4.79	3.78	5.03	3.49
June	1.50	5.97	5.10	6.20
July	4.97	4.69	5.87	2.85
August	4.66	4.82	6.15	3.15
September	3.63	1.55	2.26	3.99
October	5.37	6.32	2.29	2.41
November	4.93	2.14	5.62	5.03
December	0.01	2.17	3.05	5.18
Total (MG)	959	1,358	1,847	1,311

Figure 4-7 Yearly Total Effluent Flows to Reclamation



Please note that effluent deliveries are approximately 93% of inflow to the WWTP. This difference is due to evaporation resulting from storage time in the effluent ponds.

Page Left Blank Intentionally

Section 5

Collection System Evaluation

5.1 Evaluation Criteria

The collection system is required to comply with the *Statewide General WDRs for Sanitary Sewer Systems* (WQO No. 2006-0003). This order requires that the District provide "...adequate capacity to convey base flows and peak flows, including flows related to wet weather events..." and "...take all feasible steps to eliminate sanitary sewer overflows...". It is District policy to comply with this requirement by requiring the following design standards:

With exception of the outfall sewer, the peaking factor for sewer design shall not be less than 3.0 and shall require approval by the District. Design peak flows in pipelines 12 inches in diameter and smaller shall be limited to an approximate liquid depth to pipe diameter ratio of 0.50. Design peak flows in pipelines 15 inches in diameter and larger to be limited to an approximate liquid depth to pipe diameter ratio of 0.75. The minimum pipeline diameter for any main within NORSD shall be 8 inches. The Manning's n values to be used for NORSD sewers are n=0.011 for plastic pipe and n=0.013 for all other pipe materials.

Table 5-1 NORSD Minimum Sewer Pipe Slopes

Pipe Diameter	Plastic Pipe Slope (ft./ft.)	Other Pipe Slope (ft./ft.)
8	0.0024	0.0035
10	0.0018	0.0024
12	0.0014	0.0019
15	0.0010	0.0014
18	0.0008	0.0011
21	0.0007	0.0009
24	0.0006	0.0008
27	0.0005	0.0007
30	0.0004	0.0006
33	0.0004	0.0005

5.2 Hydraulic Model Analysis

The hydraulic model was run at peak flow, based on multiplying an estimated 6.0 MGD average day flow at the WWTP by a peaking factor of 3.0 for a total of 18.0 MGD.

5.3 Overcapacity Sewer Pipeline Segments

The results of the hydraulic model analysis showed multiple sections of the collection system are over 75% of capacity. These sections are shown in **Table 5-2**.

Table 5-2 Sewer Pipeline Segments Overcapacity

ID	Street Name	Diameter (inches)	Length (feet)	Flow/Capacity (%)
5525	Norris Road	8	375	425
3754	Veneto Street	8	212	372
3147	Norris Road	8	26	257
5268	Norris Road	8	343	251
5536	Norris Road	8	377	251
5519	Norris Road	8	375	249
4088	Norris Road	8	260	242
4365	Norris Road	8	284	220
5593	Norris Road	10	385	214
4804	Norris Road	8	313	187
6151	Knudsen Drive	33	664	107
5612	Norris Road	10	387	107
5601	Norris Road	10	386	107
5585	Norris Road	10	383	106
5603	Norris Road	10	386	106
5607	Norris Road	10	386	97
5594	Norris Road	10	385	85
Total			5,340	

The segments along Norris Road are concentrated along a stretch between Pegasus Drive and Airport Drive, just east of Highway 99 and south of the airport.

5.4 Negative Slope Sewer Pipeline Segments

The results of the hydraulic model also showed a couple of sections of the collection system that have a negative slope which can hinder flow. These are listed in **Table 5-3**.

Table 5-3 Sewer Pipeline Segments Negative Slope

ID	Street Name	Diameter (inches)	Length (feet)	Slope (ft./ft.)
3723	E. Petrol Road	8	207	-0.001
3158	Calloway Drive	21	35	-0.001
Total			5,340	

It is noted the model used the NORSD GIS database for all invert elevations and sewer lengths. It is possible that errors from field surveys or inputting data may have occurred. For all sewer lines identified with concerns in **Tables 5-2** and **5-3**, before any project is identified to repair or replace pipe, it is recommended that the inverts of the segments be resurveyed and re-input into the database. The model can then be rerun to verify if projects are needed.

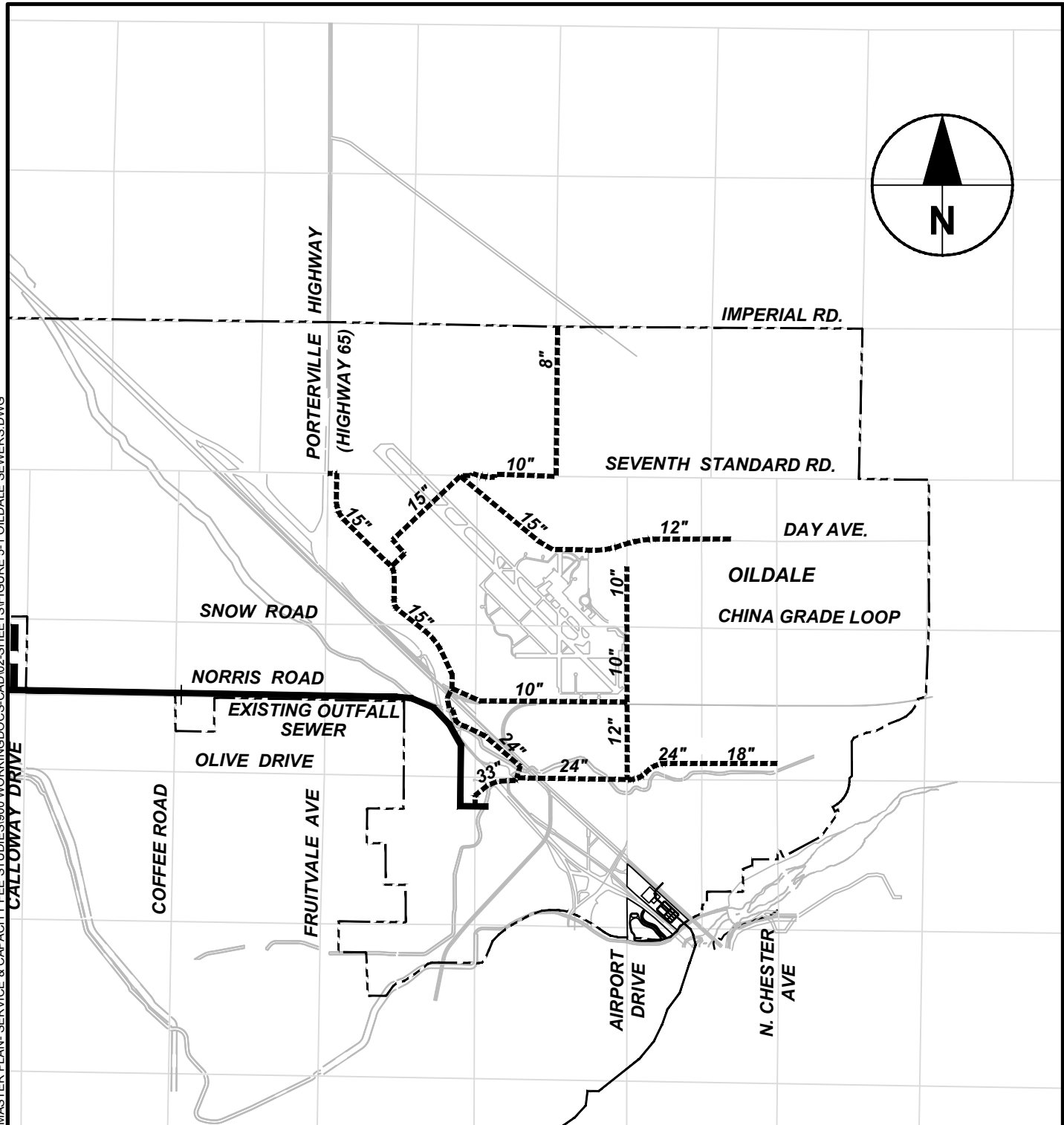
5.5 Oildale Sewer System

The sewer system that serves the Oildale portion of the Study Area is located east of Highway 99/ Mohawk Street. The Oildale sewer system conveys sewage to the east end of the Outfall Sewer. **Figure 5-1** shows the Oildale portion of the Study Area and the existing sewers.

The design of the existing Outfall Sewer assumed 6.0 MGD of average day flow capacity from Oildale. The existing Oildale sewers shown in **Figure 5-1** are expected to be inadequate to carry the full buildout average day flow of 6.2 MGD (see **Table 3-3**) to the Outfall Sewer. The existing sewers will eventually need to be paralleled and/or replaced with larger diameter sewers as flow from Oildale increases.

5.6 Future Outfall Sewer System

As discussed further in Section 7, the peak flow capacity of the existing Outfall Sewer is 27 MGD (with a Manning's $n=0.013$). With full build-out of the NORSD collection system as described above, the total estimated average daily flow conveyed to the WWTP will be 27.6 MGD. At full build-out the resulting peak will be approximately 50.3 MGD. (The formula for the peaking factor in the Outfall Sewer is listed in Section 7.2. Given the size and length of the Outfall Sewer, various localized peaks have smoothed out and reduced by the time the flows enter the Outfall. The higher the average flow, the lower the peaking factor.) To convey this amount of flow, a parallel outfall sewer will be required in the future and has been a part of NORSD's long term plans.



LEGEND

- STUDY AREA BOUNDARY
- EXISTING OUTFALL SEWER
- EXISTING TRUNK SEWERS WITH SIZE

Section 6

Sewer Design Considerations

6.1 Types of Sewers within NORSD

Additional sewers will need to be constructed as presently undeveloped lands within the Study Area are developed. In general, three types of sewers are constructed:

1. *Collector sewers*;
2. *Interceptor sewers*; and,
3. *Trunk sewers*.

These types of sewers are defined as follows:

1. **Collector sewers** are typically small diameter sewers that serve individual homes, businesses and industries. The smallest collector sewer permitted by NORSD is eight inches diameter.
2. **Interceptor sewers** carry wastewater discharged from collector sewers and discharge into trunk sewers. As a result, interceptor sewers are typically larger than collector sewers and commonly serve more than one development project.
3. **Trunk sewers** are typically large diameter sewers that carry the wastewater from interceptor sewers to the wastewater treatment plant. The Outfall Sewer is a trunk sewer under this definition.

6.2 Responsibility for Funding and Constructing Sewers within NORSD

Collector Sewers—Collector sewers will be funded and constructed by developers in accordance with NORSD standards. Ownership of the completed sewers will be transferred to NORSD for operation and maintenance.

Interceptor Sewers—The responsibility for funding and constructing interceptor sewers will fall on the developers. Interceptor sewers will be designed and constructed in accordance with NORSD standards. Ownership of the constructed sewers will be transferred to NORSD for operation and maintenance.

Trunk Sewer(s)—Trunk sewer(s) will be funded and constructed by NORSD.

6.3 Topographic Considerations for Design of Interceptor and Trunk Sewers

The topography in the Study Area is generally flat and essentially level with very small changes in elevation either north to south or east to west. West of Enos Lane, the natural ground is essentially level in some areas. Since gravity sewers require a slope in order for the sewage to flow, topography is a significant factor in sizing sewers.

Ground surface slopes within the Study Area were obtained from USGS Quadrangle Maps as shown in **Table 6-1**. The topography in the Study Area, particular in the western portion, is almost

level in the north/south direction. This is significant because avoiding sewage lift stations is desirable when designing a sewer system. Lift stations are expensive to construct, operate and maintain.

**Table 6-1
Approximate Ground Surface Slopes Within the Study Area**

		Approximate Ground Surface Slope	
		%	Feet per Mile
East/West Slopes			
Rosedale Hwy	Enos Lane to Santa Fe Way (Nord Road)	0.12	6.4
	Nord Road to Coffee Road	0.14	7.4
Hageman Rd	Enos Lane to Santa Fe Way (Nord Road)	0.10	5.3
	Nord Road to Coffee Road	0.16	8.5
Olive Dr	Enos Lane to Santa Fe Way (Nord Road)	0.07	3.7
	Nord Road to Coffee Road	0.22	11.7
Snow Rd	Enos Lane to Santa Fe Way (Nord Road)	0.05	2.5
	Nord Road to Coffee Road	0.25	13.2
7 th Standard Rd	WWTP to Enos Lane	0.03	1.6
	Enos Lane to Santa Fe Way (Nord)	0.14	7.4
	Nord Road to Coffee Road	0.34	18.0
North/South Slopes			
At WWTP	7 th Standard Road to Rosedale Highway	0.07	3.7
Enos Lane		0.02	1.1
Nord Road		0.01	0.5
Coffee Road		0.21	10.6

6.4 Sewer Capacity vs. Slope

The capacity (MGD) of a sewer is a function of its diameter, slope, roughness factor (Manning’s “n” = 0.013 assumed), and depth of flow. **Table 6-2** shows capacities of gravity sewers based on the design criteria provided in Section 5.1.

Of particular interest in **Table 6-2** are the slopes of the sewers. When comparing the sewer slopes with the slopes of the ground surface, as shown in **Table 6-1**, it can be seen that the east-west ground slopes in the Study Area are such that 24” may be the smallest diameter interceptor sewer feasible if minimizing the number of sewage lift stations is considered.

**Table 6-2
Sewer Capacity versus Sewer Slope**

Diameter (inches)	Slope		Capacity (MGD)
	(%)	Feet per Mile	
18	0.11	5.8	2
24	0.08	4.2	4
30	0.06	3.2	8
36	0.045	2.4	8
42	0.04	2.1	12
48			17
54			23
60			31
66			40
72			51

Interceptor Sewers--Since the trunk sewer(s) will run east to west, interceptor sewers will be aligned north/south.

There are two important issues with respect to designing the interceptor sewers related to topography:

1. Depth; and,
2. Slope.

Collector sewers will extend from the interceptor sewers into development projects (subdivisions, for example). A minimum of approximately six feet of cover is needed over collector sewers. The interceptor sewers will connect to the Outfall Sewer and the Parallel Trunk Sewer. The soffit elevations of the trunk sewers are “fixed” since the Outfall Sewer exists. The design of the interceptor sewers will need to consider the topography in order to minimize the need for sewage lift stations.

Page Left Blank Intentionally

Section 7

Trunk and Interceptor Sewers

7.1 Introduction

In the future, a Parallel Trunk Sewer will be constructed parallel to the Outfall Sewer. The 2013 Master Sewer Plan proposed that the new Parallel Trunk Sewer would be located close (100 feet ±) to the Outfall Sewer and constructed at essentially the same soffit elevations. The Outfall Sewer and Parallel Trunk Sewer would be connected at interceptor sewers tie-in locations. This is still the plan for the future implementation of the Parallel Trunk Sewer. However, since 2013 portions of 7th Standard Road have begun to be developed and Southern California Gas Company is installing a 24-inch gas main in early 2018. Given these new conditions, a conceptual alternative alignment west of Santa Fe Way has been added to this Master Plan Update for consideration by NORSD. The discussion in this Section focuses on the original Parallel Trunk Sewer plan developed in the 2013 Master Sewer Plan. Information on the alternative alignment is added where appropriate.

Figure 7-1 shows the diameters, slopes, and segment lengths of the existing Outfall Sewer. The Outfall Sewer is constructed of high density polyethylene (HDPE) “ribbed” pipe for its entire length.

Figure 7-2 shows the existing Outfall Sewer capacities by reach.

7.2 Parallel Trunk Sewer

Preliminary design of the Parallel Trunk Sewer was based on the sewer’s capacity to handle peak flows. The peak flow capacity of the Outfall Sewer was calculated based on the following assumptions:

- Minimum sewer diameter is 30 inches;
- Peaking factor = $2.54 \times Q_{avg}^{-0.1}$ (Q_{avg} = MGD [adopted in the 2013 Master Sewer Plan]);
- Manning’s “n” = 0.013;
- Depth of peak flow in sewer \leq 75% of the diameter of the sewer; and,
- Minimum sewage velocity \geq 2 feet per second at 50% full.

Table 7-1 summarizes the design flows for the Parallel Trunk Sewer. The elevations of the soffits of the Outfall Sewer and Parallel Trunk Sewer will be essentially the same along the sewer alignment.

Therefore, the slopes of the sewer will match the Outfall Sewer slopes.

Figure 7-3 shows the alignment for the proposed Parallel Trunk Sewer. The alternative alignment along Kratzmeyer and Snow Roads is shown in concept.

Figures 7-4 and **7-5** show a profile of the Existing and proposed Parallel Trunk Sewer. Due to a significant difference in length west of Santa Fe Way, the alternative parallel trunk sewer alignment is not shown in the profile.

7.3 Interceptor Sewers

Figure 7-3 also shows proposed alignments for 10 north/south interceptor sewers that would discharge into the Outfall Sewer and the Parallel Trunk Sewer. The ten interceptor sewers would be connected to each other by “flow equalization sewers” at the interceptor sewer locations. The flow equalization sewers would allow the water surface elevations in the two sewers to equalize. Given the capacity of the Parallel Trunk Sewer and the current estimated flow at full buildout, it may be possible to convey all of the flows from Oildale in the existing outfall sewer to Verdugo Lane with the exception being Victor Street. Further investigation and modelling will be required in the future, but there is a possibility to eliminate 17,000 feet of the proposed Parallel Trunk Sewer from Fruitvale to Verdugo Lane. While this may be a possibility in the future, for the purpose of this Master Plan, the full length of the Parallel Trunk Sewer remains.

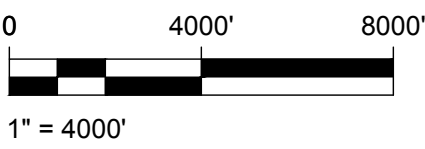
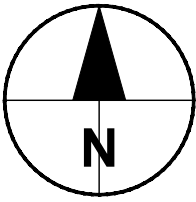
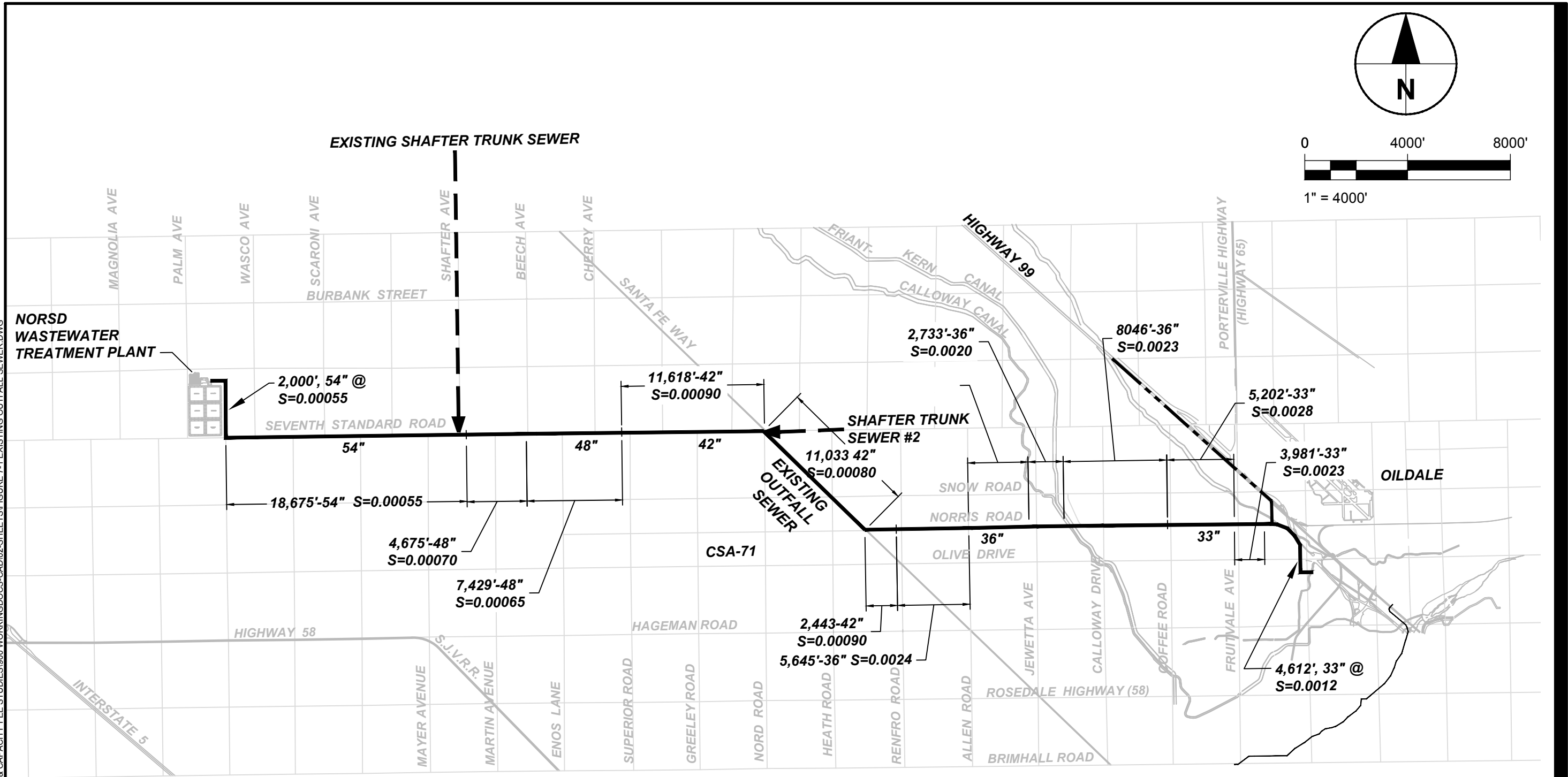
The alternative alignment for the Parallel Trunk Sewer is also noted on **Figure 7-3**. Due to the different alignment, the invert elevations of the two sewers west of Santa Fe Way would not be equal and therefore the flow equalization sewers would not be practical. If the alternative alignment is selected in the future, the redundancy feature of the Parallel Trunk Sewer would not be available in the event one of the lines had to be taken out of service. For that condition, the District would have to bypass pump from one sewer to the other.

Figures 7-6, 7-7, and 7-8 are profiles of the north/south interceptor sewers. The limits of the Study Area are shown on the profiles. As shown on **Figure 7-3** and in the profiles on **Figures 7-6, 7-7, and 7-8**, nine sewage lift stations lifting sewage from the interceptor sewers into the Outfall Sewer and Parallel Trunk Sewer may be needed. The soffit elevations of the alternative alignment of the Parallel Trunk Sewer are also noted on the applicable profiles. Elevations of the interceptor sewers would be adjusted to accommodate the alternative alignment.

The lift stations would be approximately 35 feet deep. If the alternative parallel sewer is implemented, it may be possible to eliminate some of the lift stations. Another design feature to consider in the future would be to lower the invert elevation at the new headworks by about 5 feet to accommodate the slopes and connection inverts of the interceptor sewers west of Santa Fe Way. This has the potential of further reducing the number of lift stations needed in the future. This lower invert elevation of the alternative alignment of the Parallel Trunk Sewer is shown in the interceptor profiles shown in **Figures 7-6, and 7-7**.

**Table 7-1
Parallel Trunk Sewer Design**

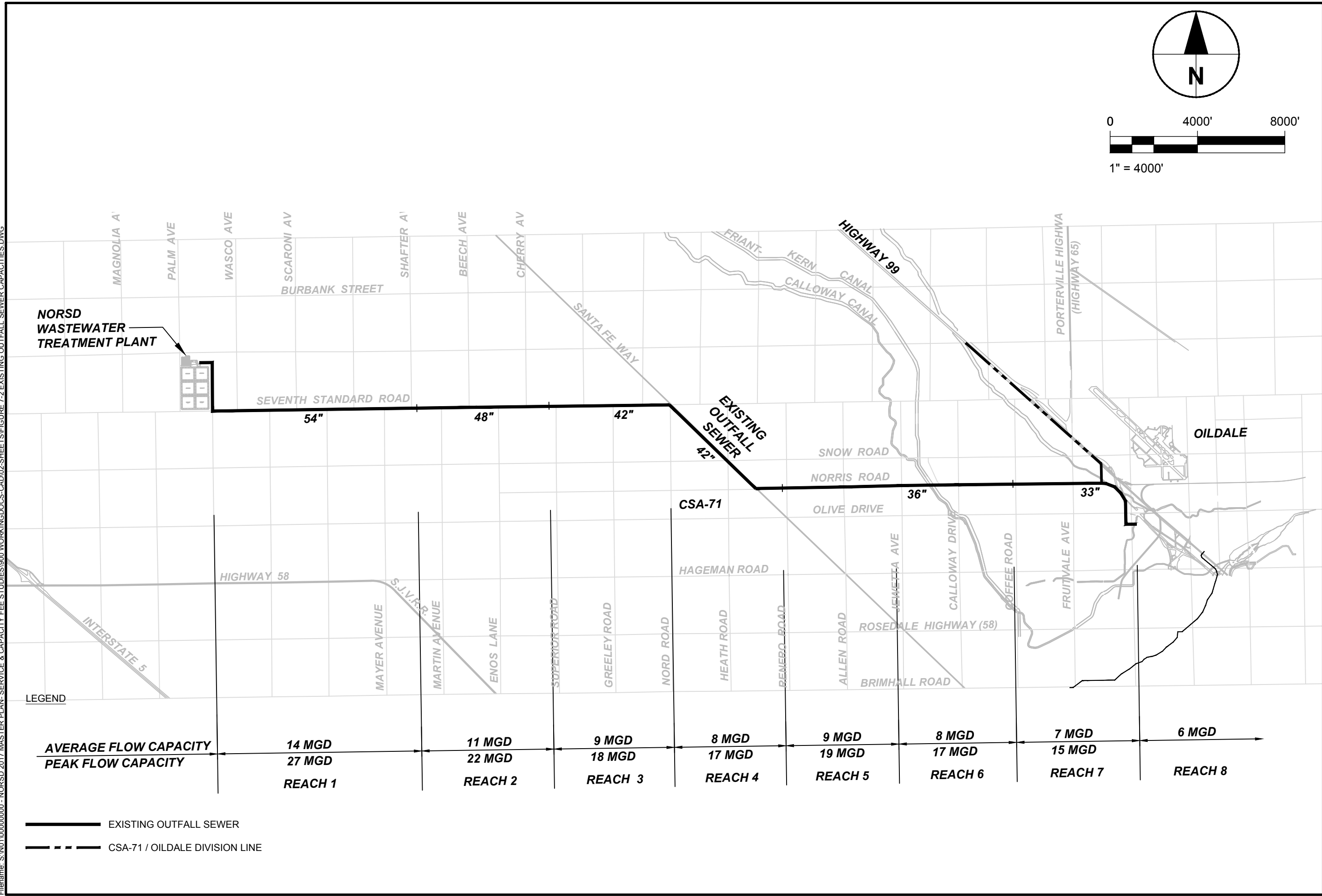
	(Feet)	Sewer Slope (%)	Sewer Diameter (in.)		Total	Peak Flow (MGD)		% Full	
			Existing Outfall Sewer	Proposed Parallel Sewer		Existing Outfall Sewer	Proposed Parallel Sewer	Existing Outfall Sewer	Proposed Parallel Sewer
Beginning to Victor St (Reach 8)	4,612	0.12	33	33	13	6.5	6.5	0.55	0.55
Victor St to Fruitvale Ave (Reach 7)	3,981	0.23	33	33	15	7.5	7.5	0.5	0.5
Fruitvale Ave to Coffee Rd (Reach 7)	5,202	0.28	33	33	17	8.5	8.5	0.5	0.5
Coffee Rd to Verdugo Ln (Reach 6)	8,046	0.23	36	36	19	9.5	9.5	0.49	0.49
Verdugo Rd to Jewetta Ave (Reach 6)	2,733	0.20	36	36	21	10.5	10.5	0.54	0.54
Jewetta Ave to Allen Rd (Reach 5)	4,694	0.23	36	36	23	11.5	11.5	0.55	0.55
Allen Rd to Renfro Rd (Reach 5)	5,645	0.24	36	36	26	13	13	0.57	0.57
Renfro Rd to Santa Fe Way (Reach 4)	2,443	0.09	42	42	29	14.5	14.5	0.65	0.65
Santa Fe Way to 7 th Std Rd/Nord (Reach 4)	11,033	0.08	42	48	37	17	17	0.75	0.65
7 th Std Rd from Santa Fe to Superior Rd (Reach 3)	11,618	0.09	42	54	45	16	16	0.69	0.68
Superior Rd to Beech Ave (Reach 2)	7,429	0.065	48	54	47	21	21	0.73	0.67
Beech Ave to Shafter Ave (Reach 2)	4,675	0.07	48	54	49	21	21	0.73	0.71
Shafter Ave to WWTP (Reach 1)	20,675	0.055	54	54	52	26	26	0.72	0.72
	92,786								

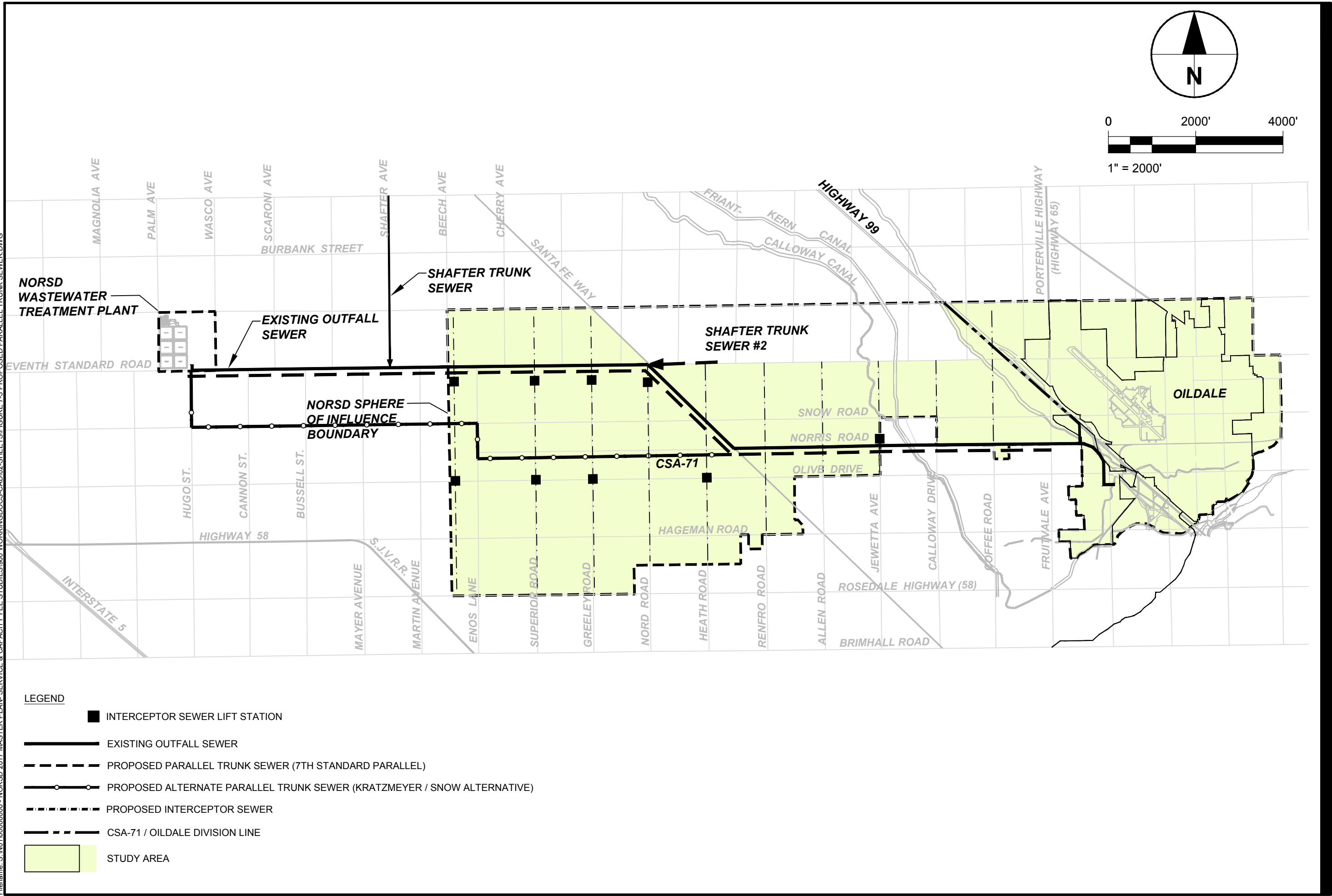


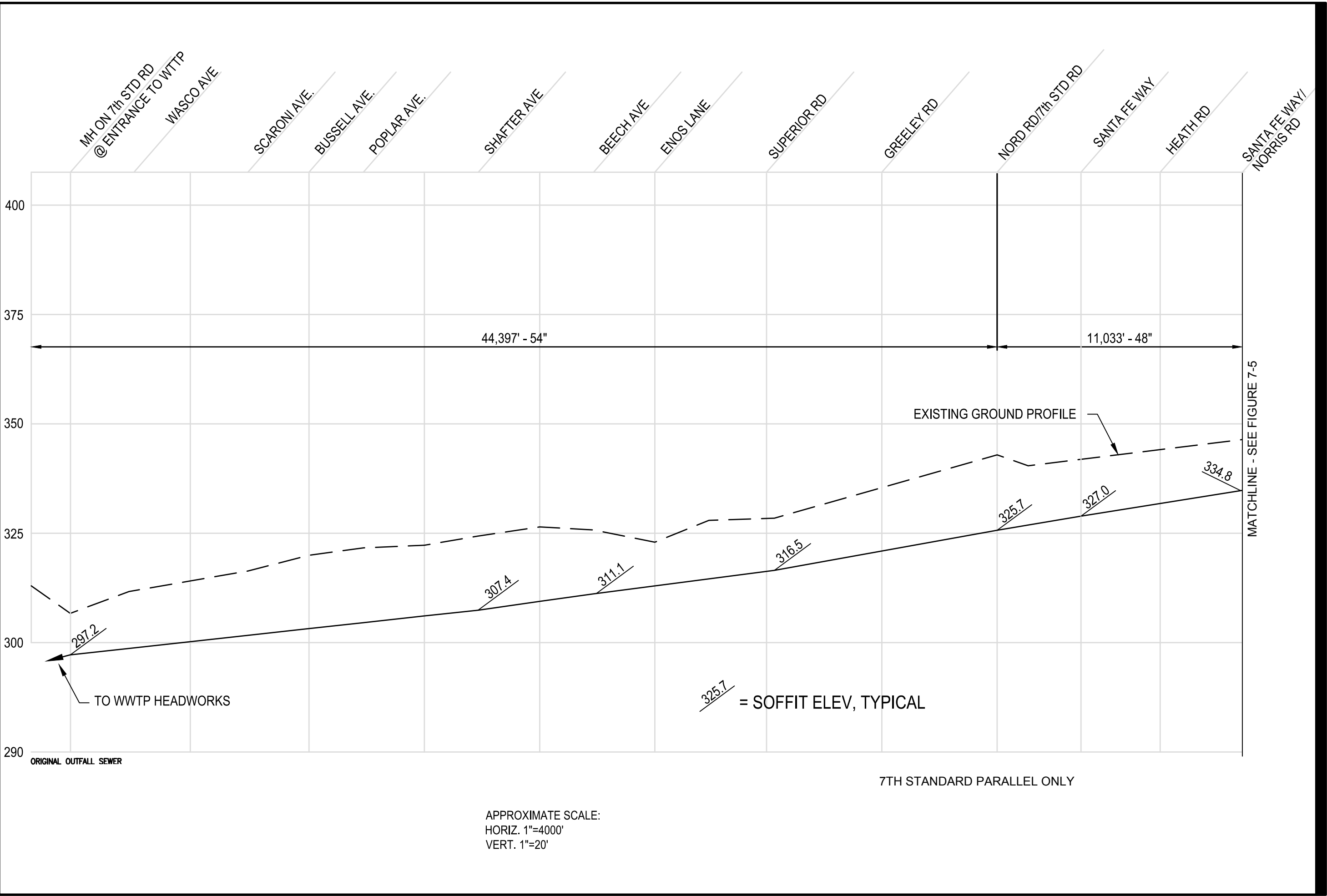
- LEGEND**
- EXISTING OUTFALL SEWER
 - CSA-71 / OILDALE DIVISION LINE

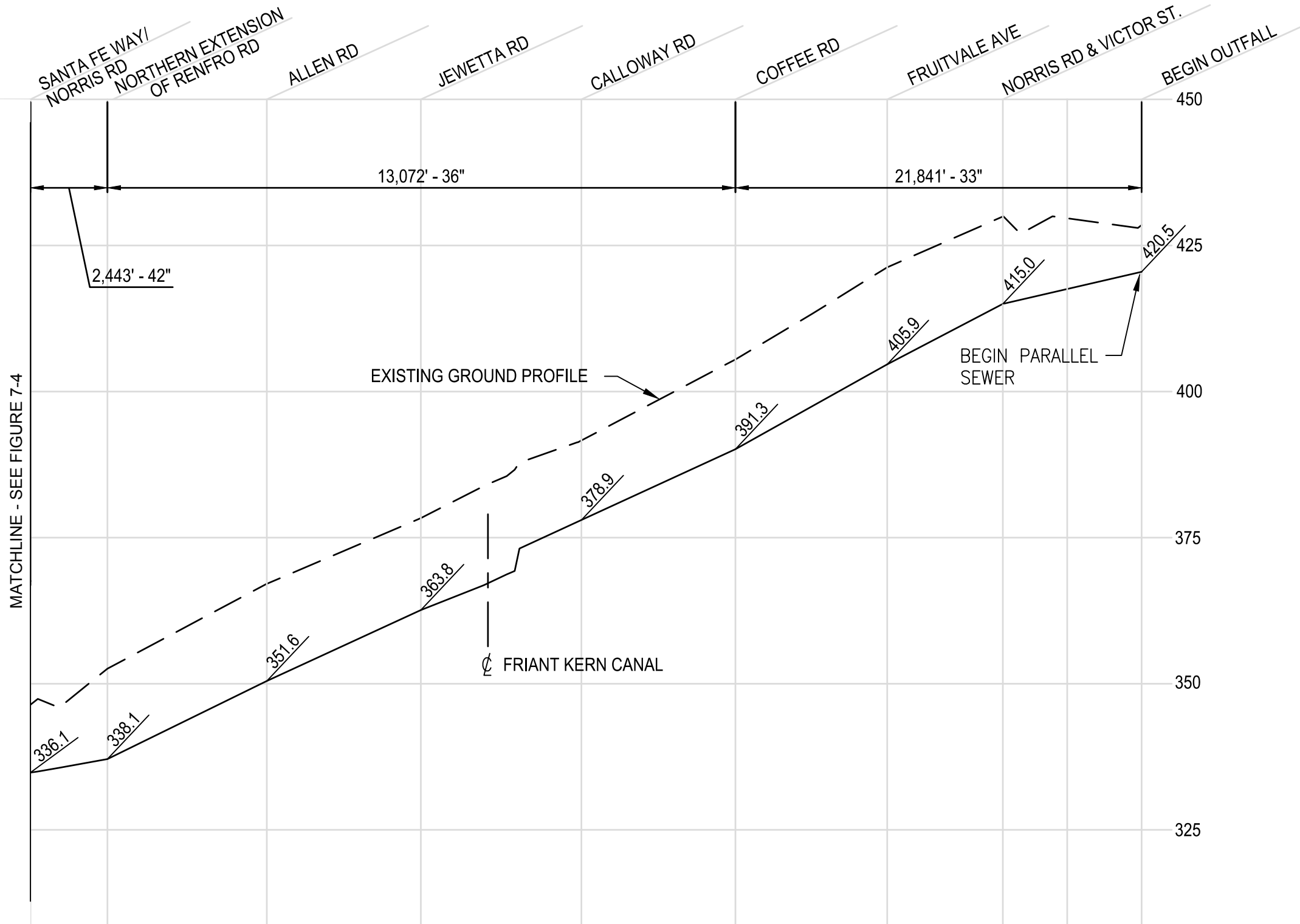
EXISTING OUTFALL SEWER

NORTH OF RIVER SANITARY DISTRICT
 2018 MASTER SEWER PLAN UPDATE
 NORTH OF RIVER SANITARY DISTRICT
 Project No.: 60545074 Date: 2018-01-10



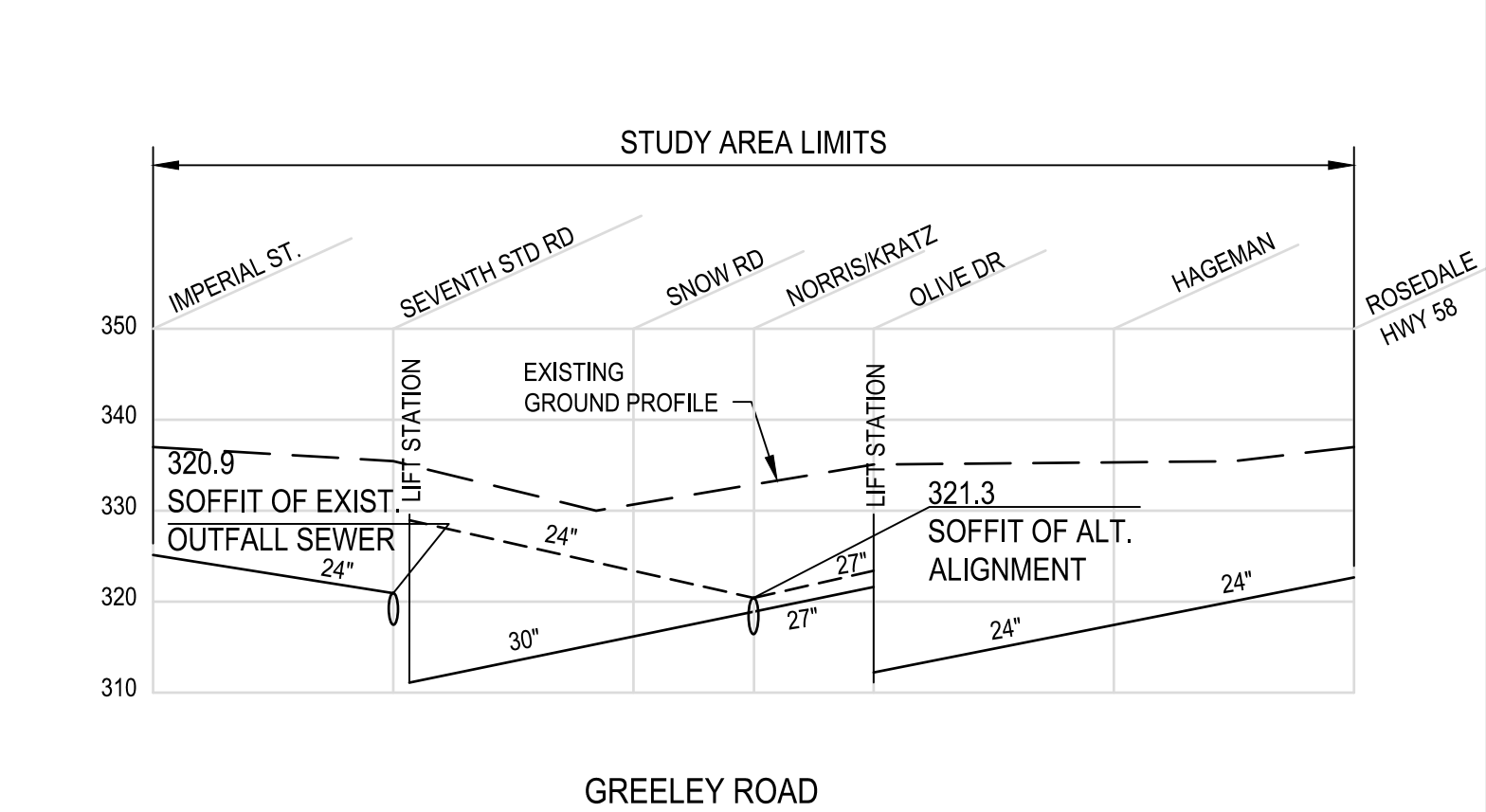
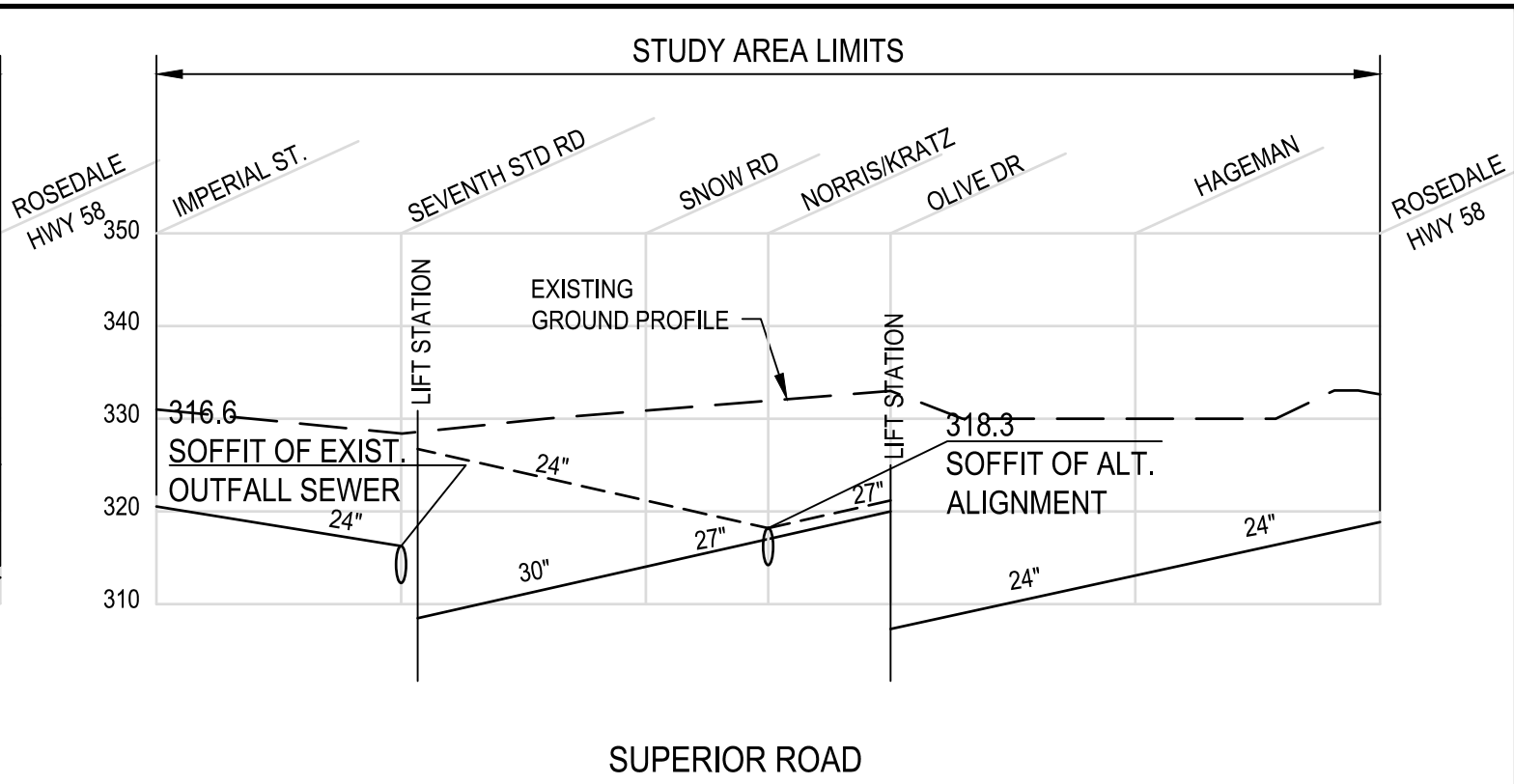
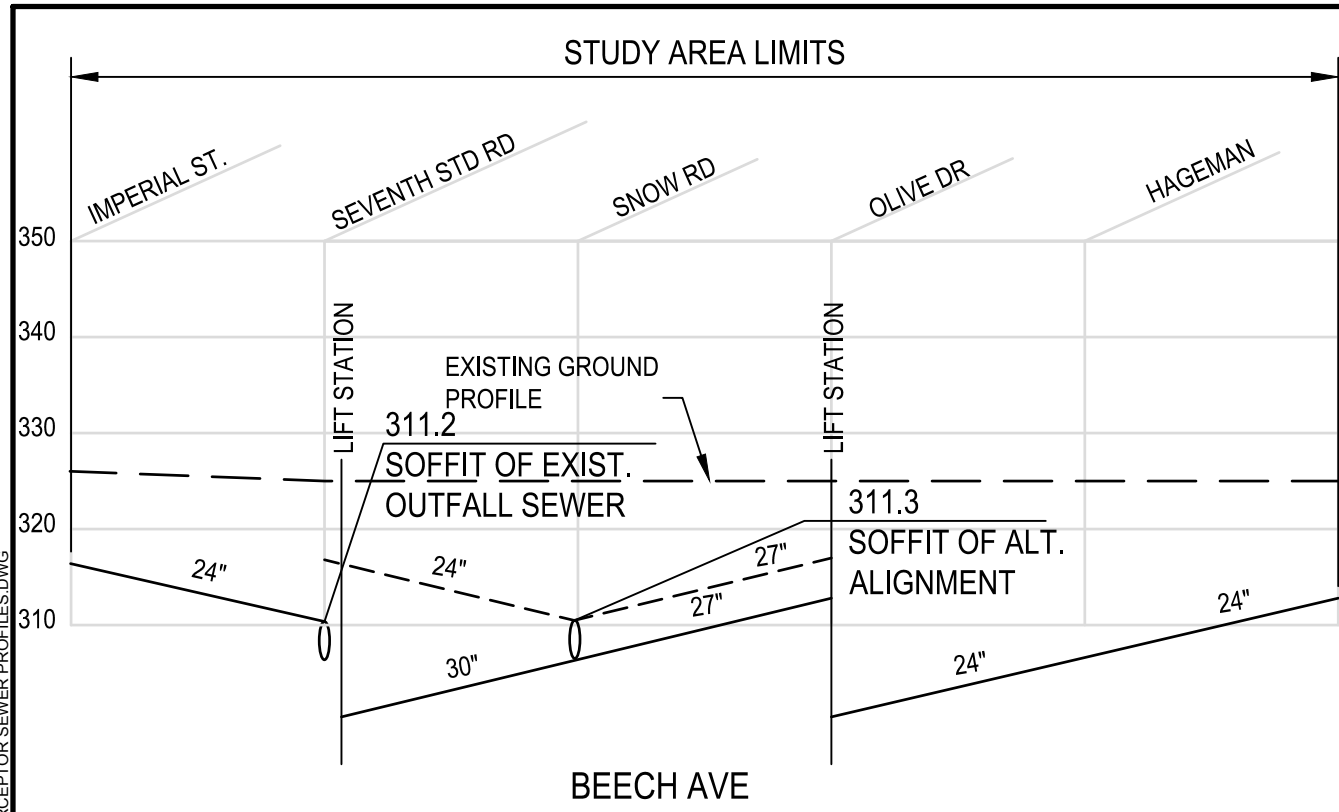






APPROXIMATE SCALE:
 HORIZ. 1"=4000'
 VERT. 1"=20'

Last saved by: GABRIEL ROSALES(2018-03-14) Last Plotted: 2018-03-15
 Project Management Initials: _____ Designer: _____ Checked: _____ Approved: _____ ANSIB 11" x 17"
 Filename: S:\0100000000 - NORSD 2017 MASTER PLAN - SERVICE & CAPACITY FEE STUDIES\900 WORKING\DOCS\CAD\02-SHEETS\FIGURE 7-6 INTERCEPTOR SEWER PROFILES.DWG

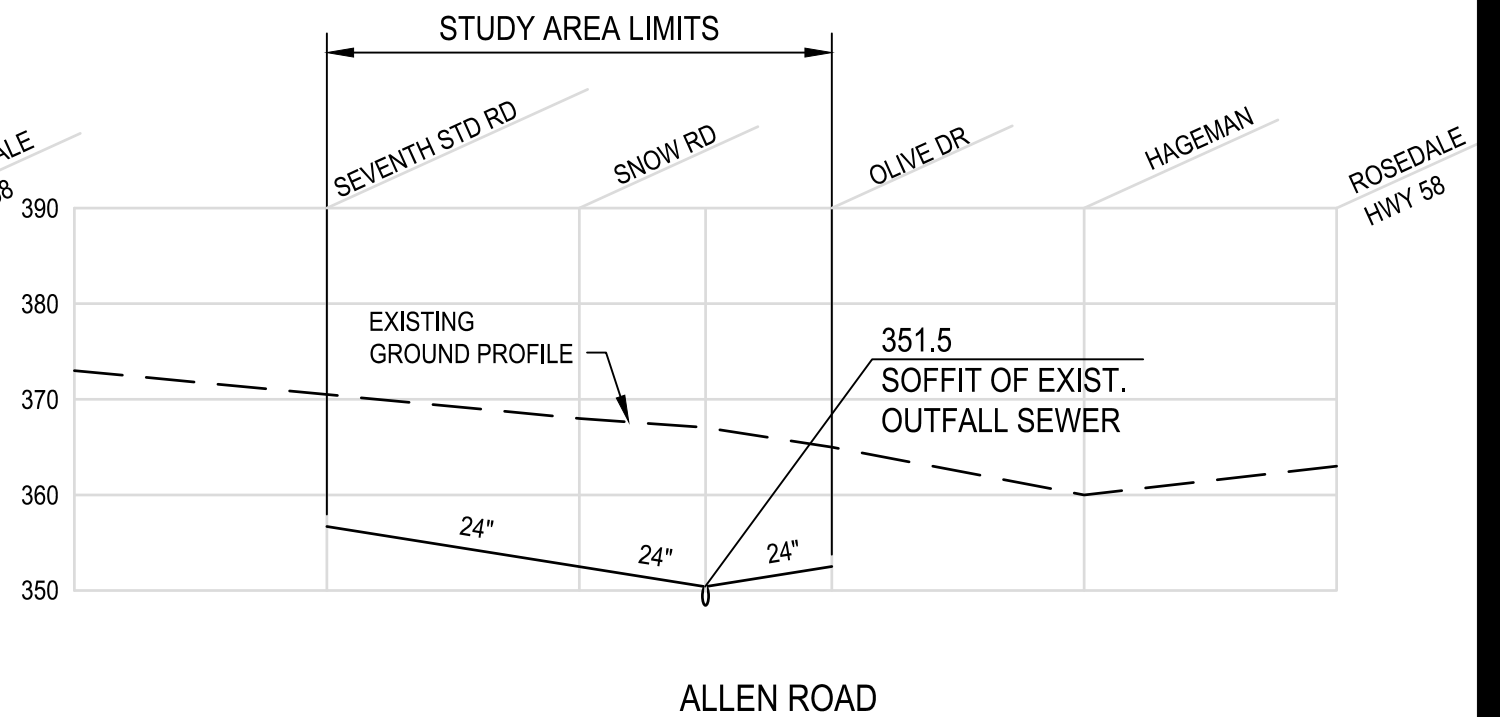
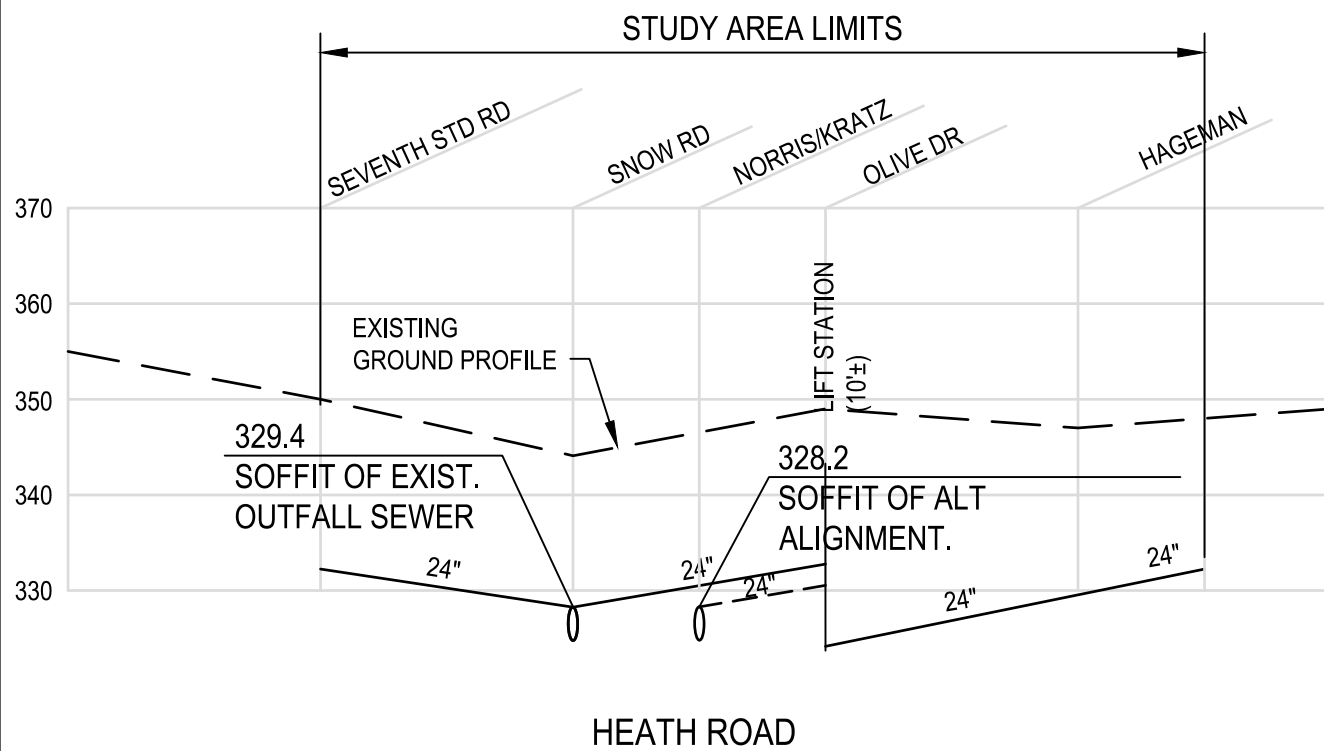
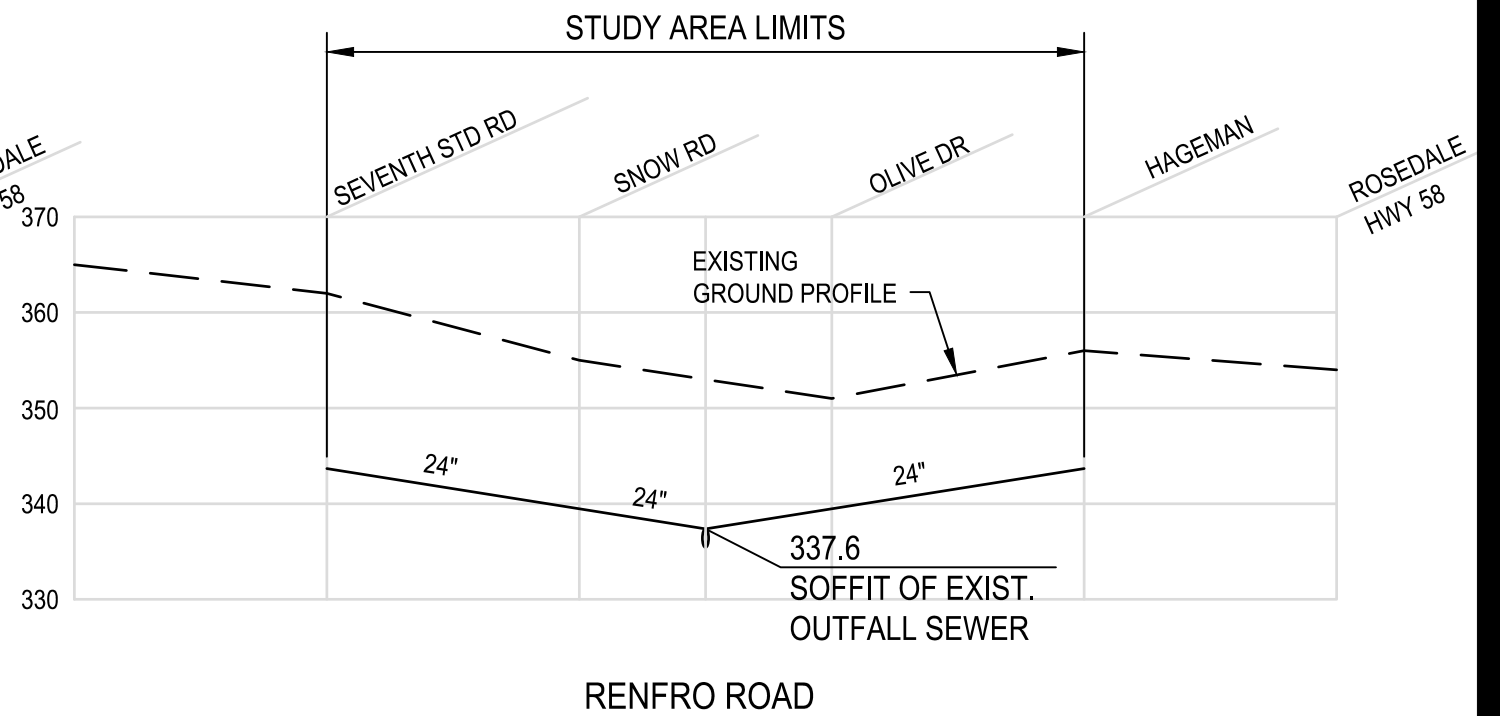
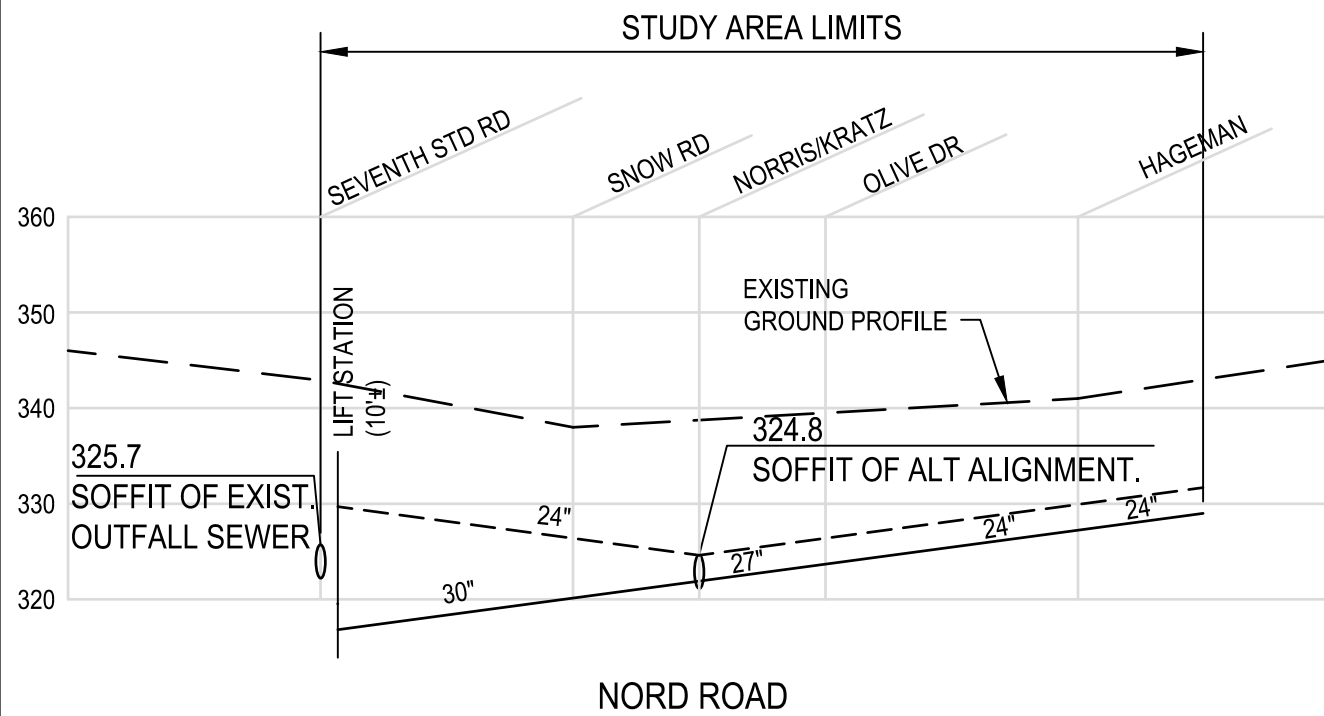


APPROXIMATE SCALE:
 HORIZ. 1"=4000'
 VERT. 1"=20'

INTERCEPTOR SEWER PROFILES

NORTH OF RIVER SANITARY DISTRICT
 2018 MASTER SEWER PLAN UPDATE
 NORTH OF RIVER SANITARY DISTRICT
 Project No.: 60545074 Date: 2018-01-10

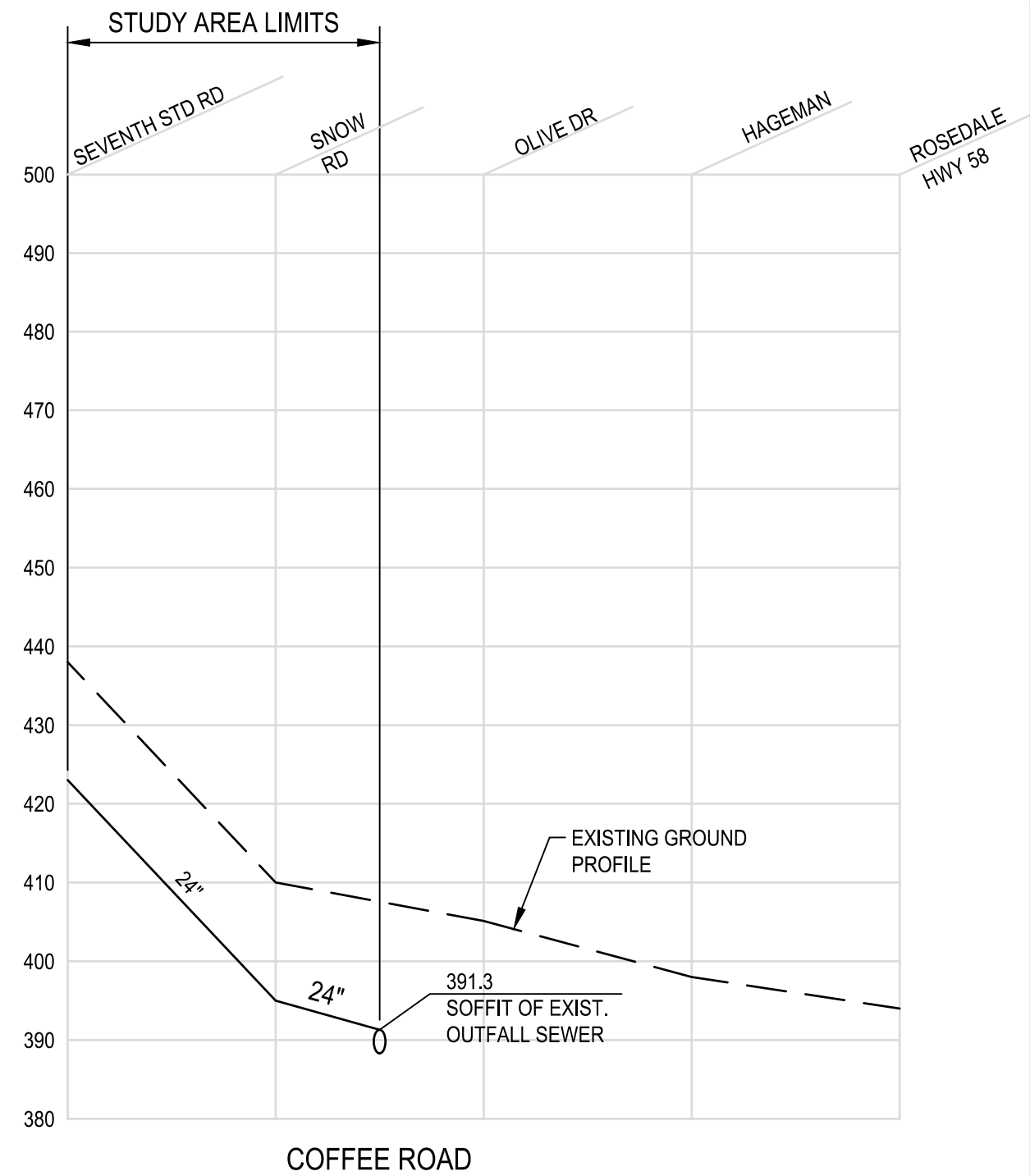
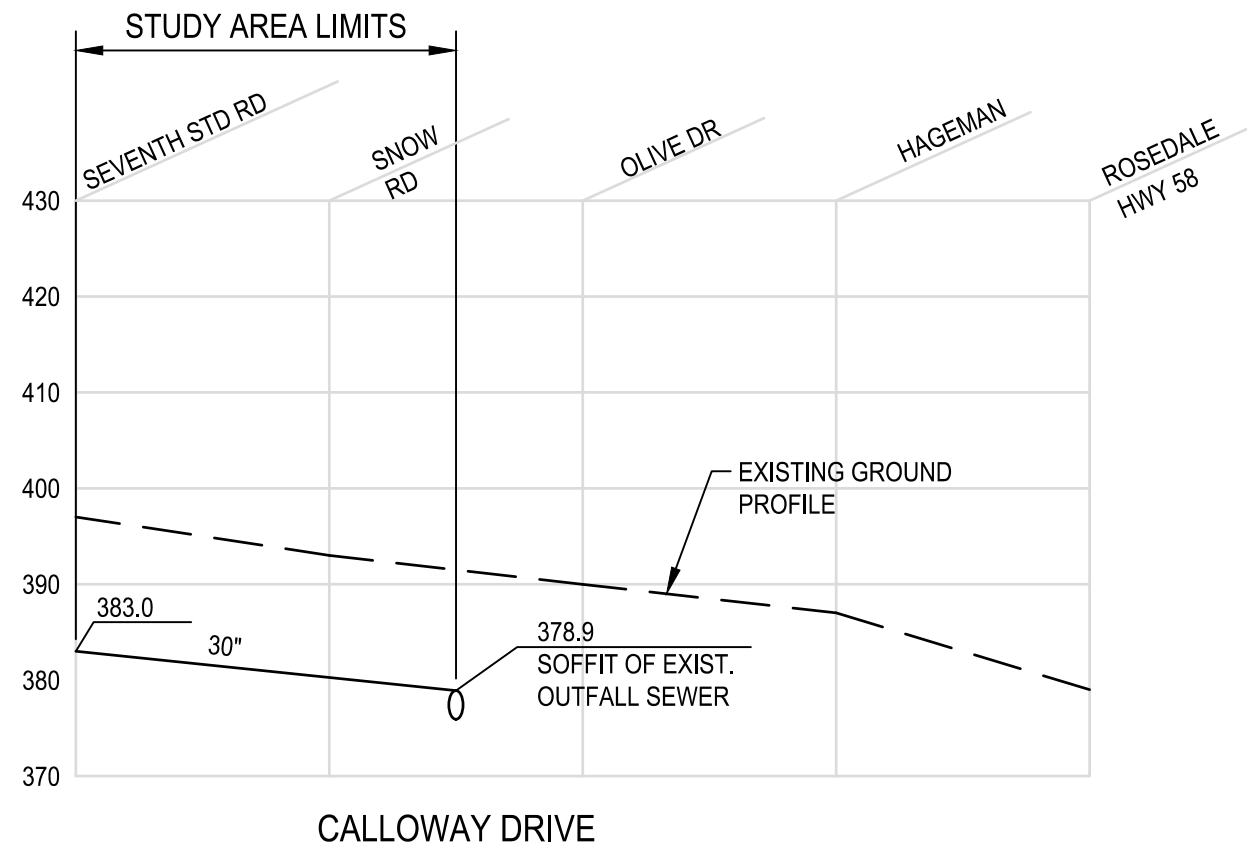
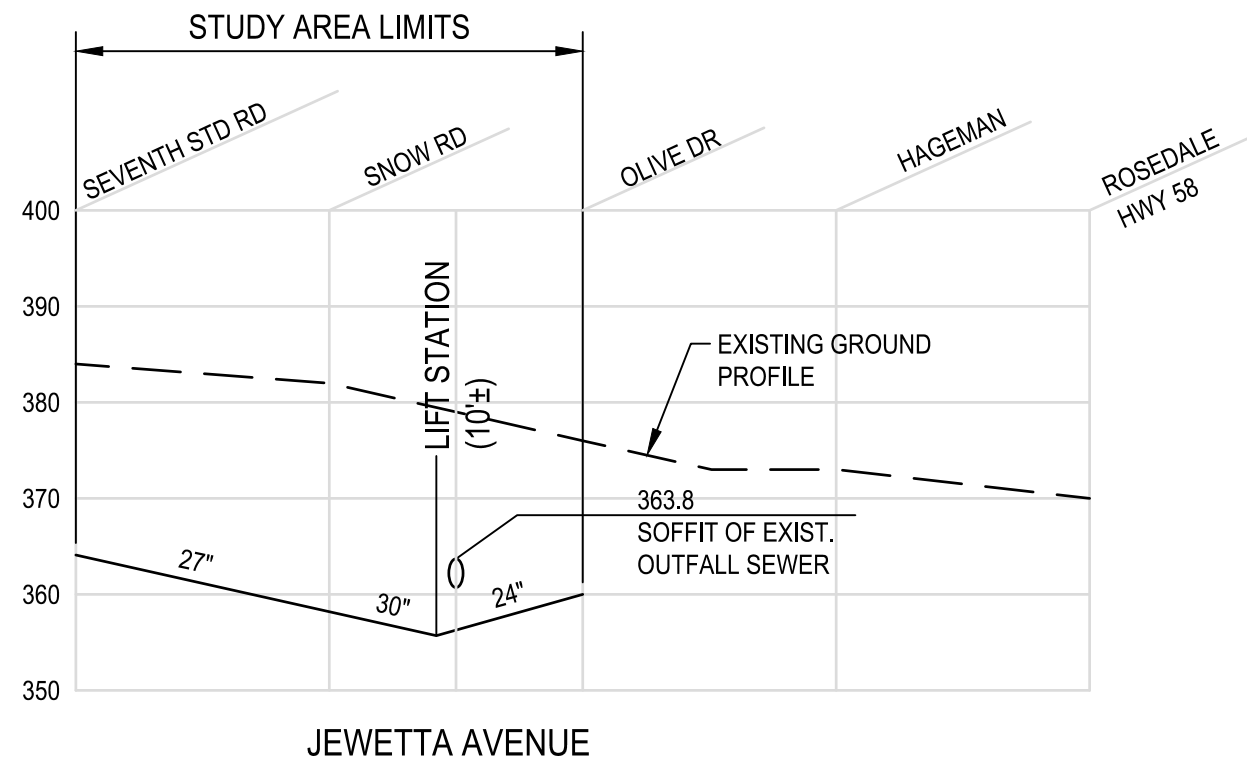
Last saved by: GABRIEL ROSALES(2018-03-14) Last Plotted: 2018-03-15
Filename: S:\0100000000 - NORSD 2017 MASTER PLAN - SERVICE & CAPACITY FEE STUDIES\900 WORKING\DOCS-CAD\02-SHEETS\FIGURE 7-7 INTERCEPTOR SEWER PROFILES.DWG
Project Management Initials: Designer: Checked: Approved: ANSI B 11" x 17"



APPROXIMATE SCALE:
HORIZ. 1"=4000'
VERT. 1"=20'

INTERCEPTOR SEWER PROFILES

NORTH OF RIVER SANITARY DISTRICT
2018 MASTER SEWER PLAN UPDATE
NORTH OF RIVER SANITARY DISTRICT
Project No.: 60545074 Date: 2018-01-10



APPROXIMATE SCALE:
 HORIZ. 1"=4000'
 VERT. 1"=20'

Section 8

Wastewater Treatment Plant Evaluation

8.1 Evaluation Criteria

The WWTP is required to comply with the current WDR (R5-2011-0011, adopted February 3, 2011). The WDR sets treatment requirements for flow capacity and effluent water quality including BOD₅. **Figure 2-3** shows the existing WWTP layout. **Figure 2-4** shows the existing WWTP process flow diagram.

8.2 Overall Treatment Capacity

The WWTP was currently designed to treat 7.5 MGD with an influent BOD₅ of 220 mg/L, which equates to 13,761 pounds per day (lbs. /day) of BOD₅. The 220 mg/L design value is listed in both the WWTP record drawings and the Plant's Operations & Maintenance Manual. The WWTP is permitted by the State of California to treat 7.5 MGD and discharge effluent with less than 40 mg/L BOD₅. The State of California requires that the planning process for expansion of the WWTP occur when flows and/or treatment capacity is less than 80% of average day. By approximately 2022, the projected average daily flow of 6.0 MGD will be reached which is 80% of the permitted capacity. Therefore, hydraulic improvements to the plant must be initiated at that time. It is noted the daily BOD₅ loading at the plant is currently over 80 percent of design capacity. The average daily influent BOD₅ concentration in 2017 was 254.6 mg/L. **Table 8-1** presents a summary of these calculations.

Table 8-1 WWTP Treatment Capacity

	Hydraulic Capacity (MGD)	BOD ₅ Loading Capacity (lbs./day)
Design	7.50	13,761
Permitted	7.50	n/a
80% of Design	6.00	11,009
Current Average Daily Influent Flow (2017)	5.44	11,544
Projected in 2022	6.09	13,002

8.3 Headworks

Raw wastewater enters the headworks and flows through two mechanical bar screens to remove large debris. One mechanical bar screen operates in an automatic cleaning mode while the second screen operates in a standby mode. A manually cleaned bar screen provides backup to the automatic screens. A screenings washer/grinder/compactor is used to wash fecal material from the mechanical screenings. The washed and dewatered screenings are deposited in a dumpster for disposal in a sanitary landfill.

The wastewater then flows by gravity to the influent pump station wet well. Four influent submersible pumps lift the screened wastewater to the vortex grit removal system and influent splitter box by way of a 30-inch raw sewage line. The influent pumping consists of two 4,200 gpm variable frequency driven (VFD) pumps and two 2,500 gpm constant speed pumps. Using the VFD and constant speed pumps together helps to maintain a nearly constant level in the wet well. In typical operation, two of the four influent pumps operate as backup pumps.

With one 4,200 gpm pump out of service, the headworks pump station currently has a firm capacity of 13.2 MGD which can handle peak flow through 2025. Future headworks capacity increases will be evaluated as part of planned WWTP expansions.

The canopy over the headworks has experienced significant corrosion and needs to be replaced.

8.4 Grit Removal

The grit removal facility, sized for a maximum flow of 12 MGD, uses gravitational and centrifugal forces to cause heavier grit particles to separate from the wastewater. The settled grit is collected in a hopper at the bottom of the tank and then flows by gravity to a grit cyclone and classifier. The cyclone uses centrifugal action to further increase the solids content of the grit. The classifier washes the grit to remove organics and then dewateres it. The liquid and organics are then returned to the headworks and the washed and dewatered grit is deposited in a dumpster for disposal in a sanitary landfill.

The current capacity of the grit removal system is sufficient to handle peak flows through 2020. However, the system lacks redundancy should the grit removal facility require repairs. The District will evaluate expanding the system during the next plant capacity increase (12MGD) and during the second expansion in the 2040 timeframe.

8.5 Primary Clarifier

Under the pumping head provided by the influent lift station, the wastewater flows through the grit system to the primary splitter box. From the primary splitter box, influent flows to the primary clarification facilities, where primary settling occurs for total suspended solids and settleable BOD reduction. Ferric Chloride and Polymer are added at the grit removal facility and the primary splitter box, respectively, to enhance settleability in the primary clarifier. The primary effluent then flows to the recirculation pump station, where it is mixed with a portion of trickling filter effluent, which is recycled and pumped by the recirculation pumps to the top of the trickling filter. The solids or sludge that is settled out on the bottom of the clarifier is pumped through the primary sludge pump station to the anaerobic digester complex for further biological treatment and volatile solids reduction. The floatable material or scum that is removed from the surface of the primary clarifiers is collected in a scum box and pumped to the anaerobic digesters for further biological treatment with the primary sludge. The primary clarifier design criteria are shown in **Table 8-2**.

Table 8-2 Primary Clarifier Design Criteria

Criteria	WWTP Design Values	2017	2020	2025
Diameter (ft.)	100	100	100	100
Side Water Depth at Tank Walls	12	12	12	12
Quantity	1	1	1	1
Surface Overflow Rate at ADF (GPD/ft ²)	866	779	845	946
Surface Overflow Rate at PHF (GPD/ft ²)	1,766	1,578	1,689	1,892
Weir Overflow Rate at ADF (GPD/ft.)	20,000	18,485	19,776	22,154
Weir Overflow Rate at PHF (GPD/ft.)	41,100	36,969	39,551	44,308
Detention Time at ADF (hrs.)	3.2	2.7	2.5	2.3
Detention Time at PHF (hrs.)	1.6	1.4	1.3	1.1

Per **Table 8-2**, the single primary clarifier will start to exceed the recommended weir overflow rates during PHF sometime between 2020 and 2025. The District will evaluate adding two additional primary clarifiers to expand capacity and provide redundancy.

8.6 Trickling Filter

Once the primary effluent arrives at the trickling filter, it passes over a fixed film biological growth media to remove carbonaceous BOD by the bacteria consuming the soluble organic pollutants. A portion of the effluent from the trickling filter, equivalent to the instantaneous plant flow, flows directly to the secondary clarifier for final clarification. The remaining flow, the difference between the recirculation pump flow rate and the instantaneous plant flow, returns to the recirculation pump station where it then pumped back to the trickling filter. The trickling filter design criteria are shown in **Table 8-3**.

Table 8-3 Trickling Filter Design Criteria

Criteria	WWTP Design Values	2017	2020	2025	2030
Diameter (ft.)	130	130	130	130	130
Media Depth (ft.)	10	10	10	10	10
Media Volume (ft ³)	132,732	132,732	132,732	132,732	132,732
Filter Type	High Rate	High Rate	High Rate	High Rate	High Rate
Media Type	60° x-flow	60° x-flow	60° x-flow	60° x-flow	60° x-flow
Media Specific Surface Area (ft ² /ft ³)	30	30	30	30	30
Total Media Surface Area (ft ²)	3,981,960	3,981,960	3,981,960	3,981,960	3,981,960
Hydraulic Wetting Rate (gpm/ft ²)	0.34 – 0.68	0.34 to 0.68			
Organic Loading (BOD ₅ /1000 ft ³ -day)	57	54			

The District will evaluate replacement of the trickling filter with an activated sludge treatment system as flows and loadings increase.

8.7 Secondary Clarifier

The secondary clarifier is designed to provide a location where solids remaining in the effluent from the trickling filter settle. The clarified liquid on the surface flows over the weir as secondary effluent. The secondary effluent is then delivered to the secondary effluent splitter box, where the flow is distributed to the effluent storage ponds. The solids or sludge that is settled out on the bottom of the clarifier flows by gravity to the headworks for co-settling in the primary clarifier. Floatable material or scum that is removed from the surface of the secondary clarifier flows by gravity to the headworks and is removed from the system with the primary scum in the primary clarifier. The Secondary Clarifier design criteria are shown in **Table 8-4**. These criteria are much more stringent than those used for the primary clarifier which accounts for the poorer settling characteristics of the slower settling biological solids from the trickling filter.

Table 8-4 Secondary Clarifier Design Criteria

Criteria	WWTP Design Values	2017	2020	2025	2030
Diameter (ft.)	125	125	125	125	125
Side Water Depth at Tank Walls (ft.)	12	12	12	12	12
Quantity	1	1	1	1	1
Surface Overflow Rate at ADF (GPD/ft ²)	505	492	526	590	662
Surface Overflow Rate at PHF (GPD/ft ²)	1030	984	1,053	1,179	1,324
Weir Overflow Rate at ADF (GPD/ft.)	15,800	14,585	15,603	17,480	19,624
Weir Overflow Rate at PHF (GPD/ft.)	32,200	29,169	31,206	34,960	39,249
Detention Time at ADF (hrs.)	5.1	4.4	4.1	3.7	3.3
Detention Time at PHF (hrs.)	2.5	2.2	2.0	1.8	1.6

The above table shows that sometime between 2017 and 2020, the design surface overflow rate of the secondary clarifier will be exceeded. The District will evaluate constructing additional secondary clarifiers to provide additional settling capacity as the plant flows and loadings increase.

8.8 Sludge Treatment

The primary and secondary biosolids generated at the facility are decomposed in a two-stage anaerobic digestion process. The primary digester is the main point of sludge digestion, where the sludge is thoroughly mixed to increase the rate of fermentation. The primary purpose of the secondary digester is to thicken and separate the digested solids from the supernatant liquor. Both digesters store accumulated digester gas (biogas) generated as a by-product of the digestion process in their covers.

The primary digester has a capacity of 645,973 gal and the secondary digester has a capacity of 551,650 gal. **Table 8-5** provides a summary of the current and projected daily sludge production along with the hydraulic retention time (HRT) in the digesters.

Table 8-5 Current and Projected Sludge Production and Digester HRT

Year	Gallons of Sludge per MG of Influent	Influent Flow (MGD)	Gallons per Day of Sludge	Digester Hydraulic Retention Time (days)
2017	4,556	5.44	24,785	48
2020	4,556	5.82	26,516	45
2025	4,556	6.52	29,705	40
2030	4,556	7.32	33,350	36

Anaerobic digestion of sludge is dependent on both temperature and HRT. Metcalf and Eddy recommend an HRT of range of 10 to 28 days depending on the temperature. Per the above table, the WWTP has capacity to digest sludge through 2030 without redundancy. The digesters are capable of producing an average of 69,930 ft³ of gas per day (cfm).

Anaerobic digestion of the sludge provides for a reduction in the volume of sludge that requires dewatering. **Table 8-6** provides a summary of the current and projected volumes of sludge from the digesters.

Table 8-6 Current and Projected Digested Sludge Production

Year	Gallons of Digested Sludge per MG of Influent	Influent Flow (MGD)	Gallons per Day of Digested Sludge	Digested Sludge Flow (gpm)
2017	4,267	5.44	23,212	16
2020	4,267	5.82	24,834	17
2025	4,267	6.52	27,821	19
2030	4,267	7.32	31,234	22

The District will evaluate adding two additional digesters to the sludge treatment system for additional treatment capacity and redundancy.

8.9 Sludge Dewatering and Disposal

When the digested solids are discharged from the secondary digester, they are directed to the dewatering facility. The dewatering facility includes digested sludge pumps, flocculation tank, screw press, and dewatered solids conveyor. Capacities are listed in **Table 8-7**.

Table 8-7 Sludge Dewatering Capacities

Component	Capacity
Sludge Pumps (2 total)	40-140 gpm each
Screw Press (Liquid)	54 gpm (@ 1.2% solids)
Screw Press (Dry)	620 lbs. per hour
Solids Conveyor	1,350 lbs. per hour

Based on the projected flows from the digester in Section 8.8, the dewatering facility has adequate capacity to dewater the sludge through 2030. However, with only one screw press, there is a lack of redundancy. The District will evaluate adding an additional screw press to increase capacity and provide redundancy.

When the solids are discharged from the dewatering facility, they are collected and deposited to two lined sludge storage basins. These two basins were formerly sludge drying beds. The plant also has eleven other sludge drying beds that are unlined and not used. The dried sludge is land applied as a soil amendment to approximately 125 acres of agricultural land for final disposal. As sludge production increases over time, NORSD will either need to change operations or line more of the existing sludge beds to create additional sludge storage basins. Changing the operations in handling sludge could include such ideas as having a composter haul it off, or additional land application.

8.10 Effluent Storage

The secondary effluent from the secondary splitter box can be distributed into four unlined storage ponds, two of which are normally used for effluent storage and the other two are used for emergency bypass storage. Each storage pond occupies approximately 32.5 acre and is 15 feet deep. The storage ponds are shown in **Figure 2-5**.

Per the water balance in **Appendix C**, the WWTP has sufficient effluent storage for flows up to 7.50 MGD. Not accounting for any irrigation, percolation or evaporation, Ponds 1 and 3 have a storage capacity of 764 acre-feet or the equivalent of 33 days storage of an influent flow of 7.5 MGD. At 12 MGD with no irrigation use, percolation or evaporation, Ponds 1, 2 & 3 have a capacity of 1126 acre-feet or 30 days of storage. Regular use of the effluent for irrigation decreases the amount of water in the storage ponds and thereby provides additional storage capacity.

8.11 Effluent Disposal

The effluent is put to beneficial reuse irrigating 2,500 acres of permitted farmland, of which 1,860 acres is owned by Sill Properties, Inc. and the remaining by NORSD. The reclaimed water is delivered to the reclamation areas via four source connections, two of which utilize gravity flow and two utilize pump stations.

Currently, there is sufficient land to dispose of flows up to 7.50 MGD per the water balance in Appendix C.

8.12 Cogeneration

The District has a cogeneration facility (cogen) to provide electricity for the WWTP and heat for the digesters; however, the electrical generation system is currently inoperable. When operating, the cogen produces electrical power using digester gas fueled microturbines driving electric generators. Hot exhaust gas from the microturbines passes through a heat exchanger. The hot water from the

heat exchanger flows through a water circulating loop to the sludge heat exchangers on the digesters. The water returns and is reheated and recycled back through the sludge heat exchangers. The sludge heat exchangers then transfer heat to the sludge.

The District also has a boiler that was installed when the plant was originally constructed. The boiler heat capacity was originally specified at 1.5 million Btus per hour (MMBtu/hr.). A pump circulates hot water from the boiler through the sludge and back to the boiler to reheat the water. The hot water pump is rated at 140 gpm.

The microturbines are not operating so digester gas is currently used in the boiler and the excess disposed of by flaring. The District will evaluate increasing the capacity of the system as part of the WWTP expansion.

Page Left Blank Intentionally

Section 9

Recommended Collection System Improvements

9.1 Cost Estimate Introduction

The following sections discuss recommended improvements to the collection system. To meet the needs of future growth beyond 2020, additional capacity is needed. This can be accomplished by constructing additional facilities within the District's SOI. These additional facilities include additional gravity sewers, lift stations, and force mains as well as replacement of deficient areas of the collection system.

The costs presented are based on prices in effect in January 2018. To escalate the cost to a future date, the Construction Cost Index published by *Engineering News Record* or similar indices should be used. For future reference, the January 2018 Engineering News Record Construction Cost Index is 10878. It is important to note that these costs were prepared for budgetary purposes only. The scope of work for each phase and the associated costs presented are based on conceptual level estimates and limited information, and are subject to change after more detailed engineering is completed and each project is better defined. For this reason a 25 percent contingency is added to the cost opinion for construction.

9.2 Items Not Included

Maintenance of existing District facilities, such as replacement of existing pumps or equipment, is not included in the recommended improvements as this work is perpetual and should be budgeted separate from capital improvements. Maintenance also includes replacement of existing sewer laterals and pipeline repair/replacement.

9.3 Parallel Outfall Sewer

Table 9-1 shows a summary cost opinion for the Parallel Trunk Sewer in 2018 dollars. The trunk sewer could be constructed in phases and the table shows cost opinions for four 9-1 phases of trunk sewer construction. A detailed cost opinion for the Parallel Trunk Sewer is included in the **Appendix D**.

**Table 9-1
Parallel Trunk Sewer Construction Phasing and Cost Opinions**

Year	Parallel Trunk Sewer Reach	Construction Cost (2018 \$)
2035	Norris Road—Begin Outfall Sewer to Renfro Rd	\$ 33.6
2045	Santa Fe Way—Norris Rd at Renfro Rd to 7 th Std Rd	\$ 18.2
2055	7 th Standard Road—Santa Fe Way to Shafter Ave	\$ 34.7
2060	7 th Standard Road—Shafter Ave to WWTP	\$ 26.3
		\$ 112.8

9.4 Interceptor Sewers

Construction of the interceptor sewers is to be the responsibility of the developers. However, the construction cost opinion for the 10 interceptor sewers including lift stations is \$158M in 2018 dollars. A detailed cost opinion for the interceptor sewers is included in **Appendix E**. As development progresses, the District will investigate and make a determination if any existing interceptor sewers are potential options in lieu of proposed interceptor sewers with lift stations in this and future master sewer plans.

9.5 Norris Road Sewer Replacement

The Norris Road Sewer conveys sewage west of Airport Drive and east of Pegasus Drive. The hydraulic model indicates that sections of the existing pipeline experience peak flows that greatly exceed (i.e. over 200%) of its capacity. Installation of an 18-inch diameter pipeline at these same locations results in unpressurized flow. **Table 9-2** includes a construction cost estimate to build this improvement.

**Table 9-2
Construction Cost Estimate for Proposed Norris Road Sewer Improvements**

No.	Description	Qty.	Unit	Unit Cost	Cost
1	Mobilization/Demobilization	1	LS	\$25,600.00	\$25,600
2	Temporary Traffic Control	1	LS	\$15,000.00	\$15,000
3	Trenching & Backfill	3,200	CY	\$10.00	\$32,000
4	Asphalt Concrete	335	TN	\$95.00	\$31,825
5	Aggregate Base	220	CY	\$45.00	\$9,900
6	18-inch PVC Sewer	2,950	LF	\$108.00	\$318,600
7	Manhole	6	EA	\$5,000.00	\$30,000
8	Bypass Pumping	3	EA	\$15,000.00	\$45,000
9	Sewer Tie-In	3	EA	\$10,000.00	\$30,000
10	Construction Contingency	25%			\$134,500
Subtotal					\$672,400
	Engineering	12%			\$80,700
	Construction Management	10%			\$67,200
Total					\$820,300

9.6 Collection System Improvements

Sags in the existing collection system decrease hydraulic capacity and make maintenance more difficult for District staff. **Table 9-3** provides a construction cost estimate for the more critical identified sag sections previously described. Although the cost estimate is presented as single table, this work does not necessarily have to be done as a single project.

**Table 9-3
Construction Cost Estimate for Collection System Improvements**

No.	Description	Qty.	Unit	Unit Cost	Cost
1	Mobilization/Demobilization	1	LS	\$4,100.00	\$4,100
2	Temporary Traffic Control	2	EA	\$5,000.00	\$10,000
3	Trenching & Backfill	262	CY	\$10.00	\$2,620
4	Asphalt Concrete	28	TN	\$95.00	\$2,660
5	Aggregate Base	18	CY	\$45.00	\$810
6	8-inch PVC Sewer	207	LF	\$56.00	\$11,592
7	21-inch PVC Sewer	35	LF	\$147.00	\$5,145
8	Bypass Pumping	2	EA	\$15,000.00	\$30,000
9	Sewer Tie-In	2	EA	\$10,000.00	\$20,000
10	Construction Contingency	25%			\$21,700
Subtotal					\$108,600
	Engineering	15%			\$16,300
	Construction Management	10%			\$10,900
Total					\$135,800

Page Left Blank Intentionally

Section 10

Planned WWTP Expansion and Recommended WWTP Improvements

10.1 Background Assumptions for Expansion of the WWTP

As noted in Section 8, the current WWTP is designed and permitted to treat an average daily flow of 7.5 MGD. As discussed in Sections 5 through 7 above, the full build-out of the NORSD service area will produce roughly 27.6 MGD of sewage daily, which includes only 3.0 MGD from Shafter. Just as the collection system must be planned for this eventual flow, the WWTP must also be planned to treat this flow as well. The rate payers within NORSD currently fund treatment of the wastewater to undisinfected secondary standards as regulated by the RWQCB. Currently the effluent limits are 40 mg/L for both BOD₅ and TSS. It is assumed that any expansion of the capacity of the treatment plant funded by the rate payers or connection fees will be to this same water quality standard.

Given the passing of the Groundwater Sustainability Act by the State of California in 2014, wastewater effluent is a marketable commodity that can be used to recharge groundwater, if the effluent is of sufficient quality. For NORSD's effluent to be put to higher use such as recharging groundwater or irrigation of food crops, tertiary treatment and disinfection will likely be required. Costs for these additional treatment processes are not considered in this Master Plan. It is assumed that the cost to implement this additional treatment would be borne by the end user/ purchaser of the water. Their purchase cost would also cover the additional operations and maintenance costs involved in treating the effluent to the higher level.

10.2 Master Expansion Plan for WWTP

Figures 10-1 through 10-4 present conceptual layouts of each stage of expansion of the WWTP with facilities to treat an ultimate average daily flow of 30 MGD, which is roughly the flow estimated for full build-out of the service area. The expansions include the incorporation of an activated sludge process in addition to primary and secondary clarification. Solids handling requires an expansion in the capacity of digestion and dewatering.

Treatment capacity is assumed to expand in multiples of approximately 6 MGD as flows increase. Thus, the first expansion of the plant would result in a capacity of 12 MGD. For the purpose of this Master Plan, the incremental expansions are to 12 MGD, 18 MGD, 24 MGD and then 30 MGD. The conceptual layouts of these WWTP expansions are shown as follows: **Figure 10-1** (12 MGD), **Figure 10-2** (18 MGD), **Figure 10-3** (24 MGD), and **Figure 10-4** (30 MGD).

10.3 Cost Estimate Introduction

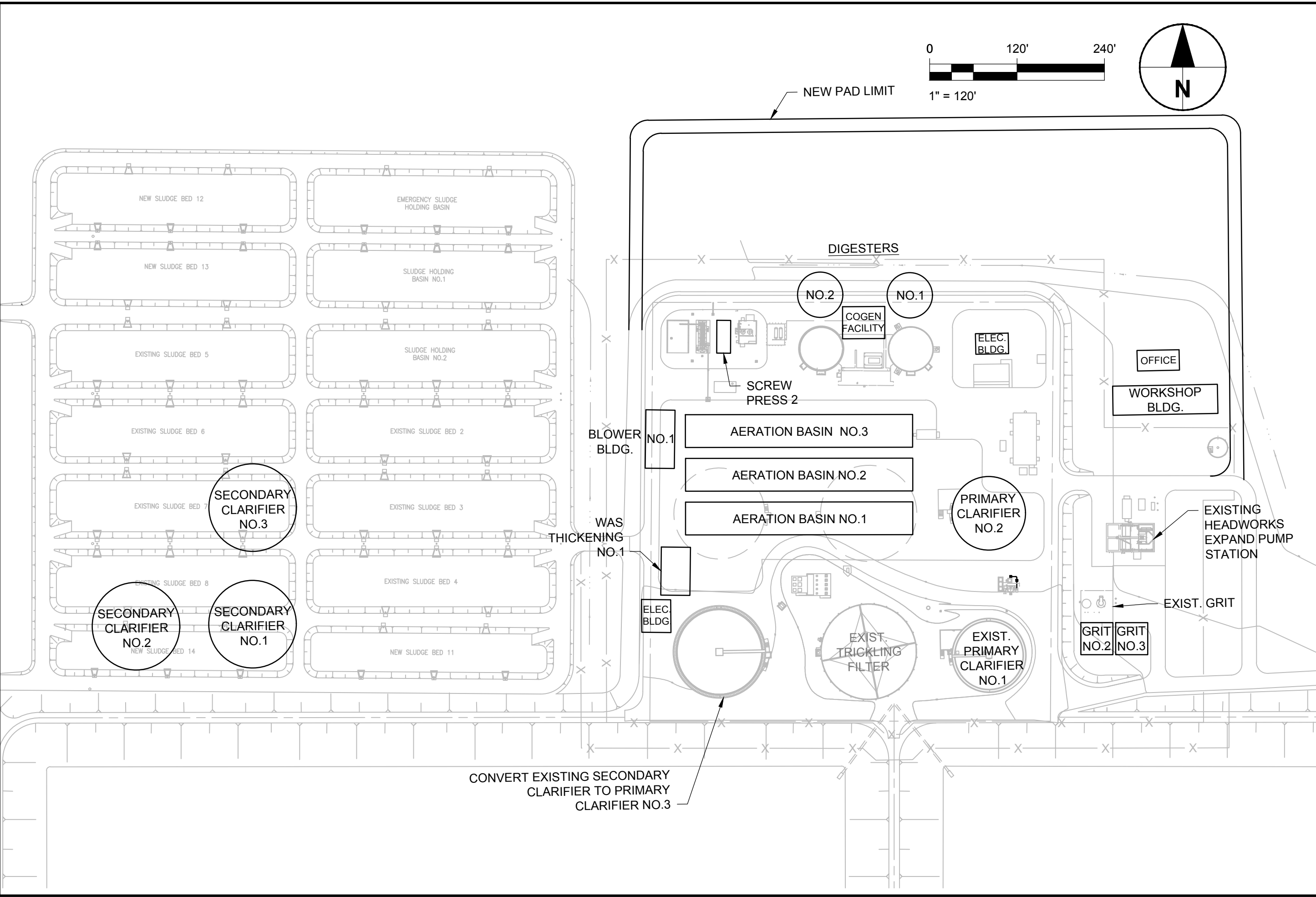
The following sections discuss recommended improvements at the WWTP within the time period of this Master Plan Update. As noted in Section 8, the average daily influent flow at the plant is expected to exceed 6 MGD or 80 percent of the permitted capacity around 2022. To meet the needs of this anticipated growth, additional treatment capacity is needed. This will be accomplished by constructing additional facilities at the WWTP. These additional facilities include additional grit removal, additional primary clarifiers, replacement of the trickling filter with an activated sludge treatment system, additional secondary clarifier(s), additional screw press, additional digesters, and possible replacement of the cogeneration plant. This expansion will only become necessary once average daily flow exceeds 80% of the permitted capacity. In the meantime, due to higher BOD₅ loading than was designed, the plant is challenged to maintain effluent water quality to 40 mg/L BOD₅ or less. Along with improvements to the trickling filter, NORSD may consider the addition of a solids contact channel for additional BOD₅ removal until such time when an activated sludge system can be added.

The costs presented are based on prices in effect in January 2018. To escalate the cost to a future date, the Construction Cost Index published by *Engineering News Record* or similar indices should be used. It is important to note that these costs were prepared for budgetary purposes only. The scope of work for each phase and the associated costs presented are based on preliminary estimates and limited information, and are subject to change after more detailed engineering is completed and each project is better defined. For this reason, a contingency of 25% is included with each estimate.

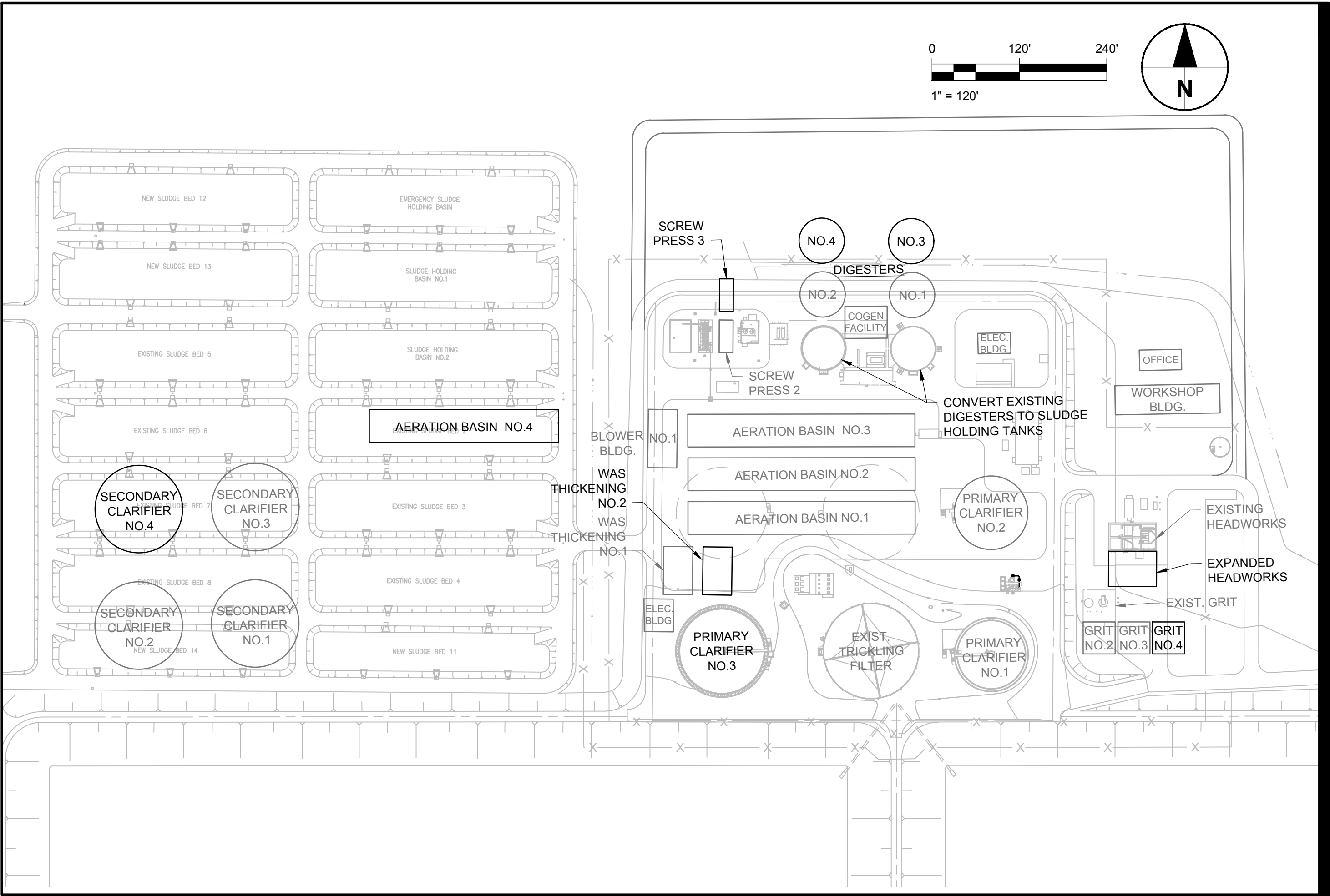
Figure 7-1 provides a preliminary layout identifying the locations of the recommended WWTP upgrades needed for expanding the plant capacity to 12 MGD. **Figure 7-5** shows a preliminary process flow diagram for the WWTP upgrade to 12 MGD.

10.4 Items Not Included

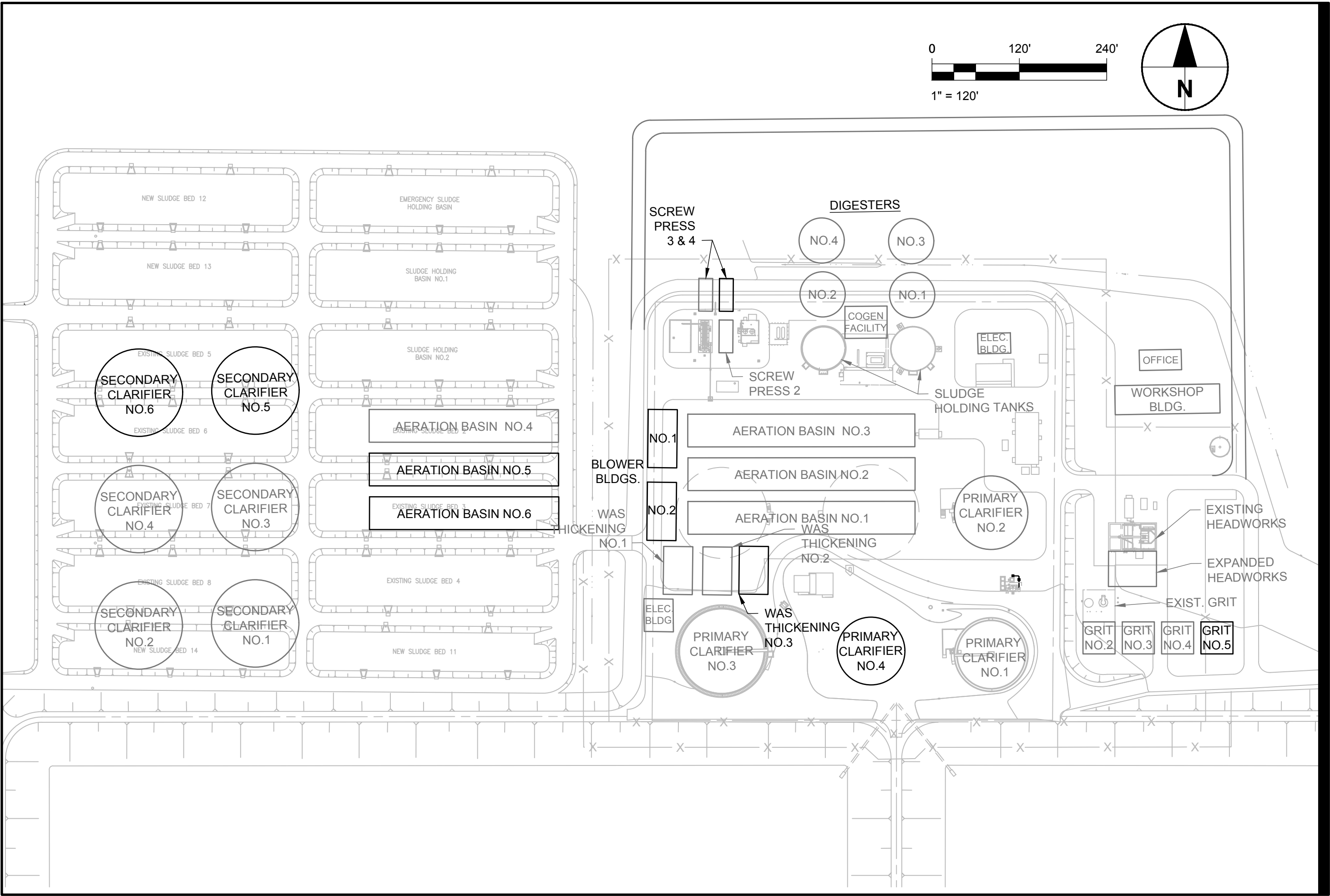
Maintenance of existing WWTP facilities is not included in the recommended improvements as this work is perpetual and should be budgeted separate from capital improvements. Funding for maintenance activities at the WWTP is from the collection of annual rates from customers.



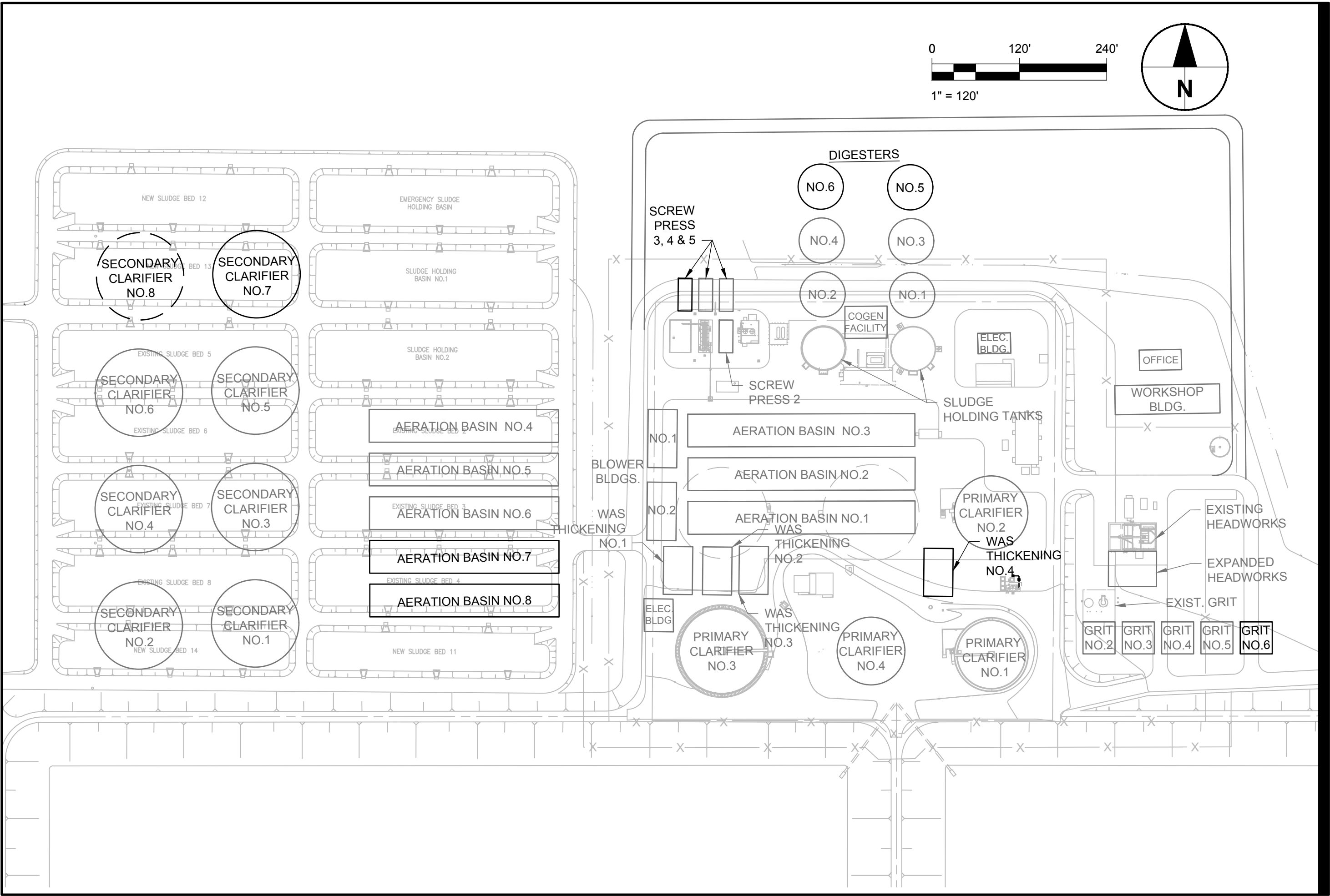
CONCEPTUAL WWTPL LAYOUT
12 MGD CAPACITY



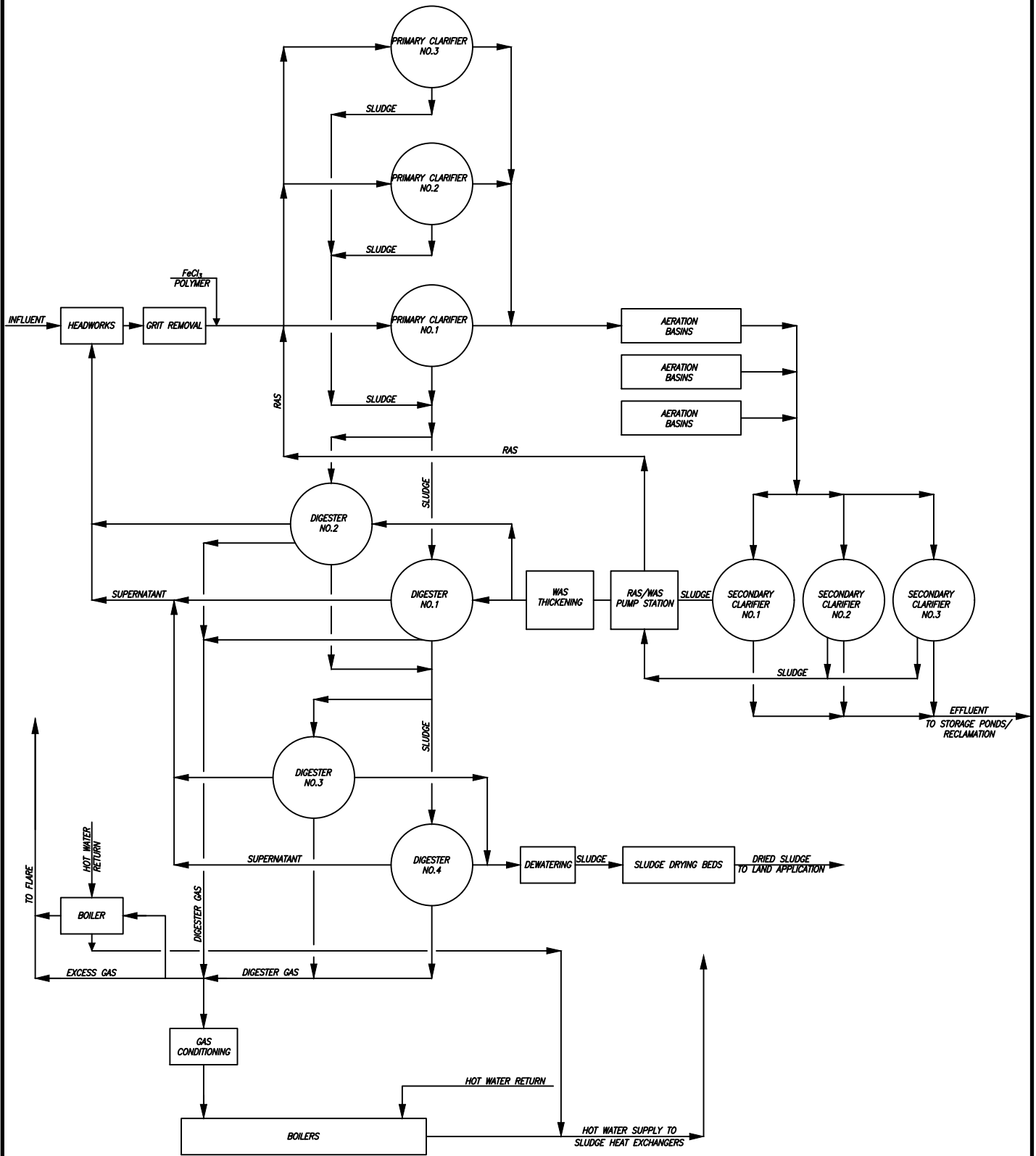
CONCEPTUAL WWTP LAYOUT
 18 MGD CAPACITY



**CONCEPTUAL WWTP LAYOUT
 24 MGD CAPACITY**



CONCEPTUAL WWTP LAYOUT
30 MGD CAPACITY



10.5 New Plant Workshop Facility

The plant staff is currently in need of a workshop area for minor repairs to equipment as well as spare parts and equipment storage. A preliminary location is included in **Figure 10-1**.

The shop would measure approximately 144 feet by 40 feet and provide over 5,000 sq. ft. of workspace, additional offices, and storage. The building will have a concrete slab, metal stud framing, bridge crane, and a metal deck roof. As part of the expansion to 12 MGD, **Table 10-2** provides a cost estimate to construct the new workshop.

10.6 Headworks Improvements

With the expansion of the WWTP to 12 MGD, the capacity of the headworks will need to be expanded. The headworks currently have a firm hydraulic capacity of 13.2 MGD which is limited by the influent pump station. The capacity of the influent pumps must be increased to accommodate the increase in peak flow.

The existing grit removal system has a maximum flow capacity of 12 MGD. With the increase in flow, a second grit system would need to be added to handle the peak flows. Cost for the headworks and grit expansions are included in **Tables 10-2 and 10-3**.

10.7 Additional Primary Clarifiers

The District will need to begin planning to construct additional primary clarification capacity when flows start to exceed 6.0 MGD. The District needs to add redundancy to the primary clarification system.

Therefore, the District will plan for two additional primary clarifiers. One new additional primary clarifier will be identical in size and operation to the existing primary clarifier with a 100-ft diameter and 12-ft side water depth at the tank walls. Construction will include new scrapers and scum baffles as well as all other required appurtenances. The targeted detention time at ADF will be 2-hours. The existing secondary clarifier will be converted into a primary clarifier to provide the needed redundancy. **Table 10-2** provides an estimate to construct the primary clarifiers.

10.8 Waste Activated Sludge Treatment System

Expansion of the capacity at the WWTP will require additional waste activated treatment. Rather than expand the existing trickling filter attached growth treatment system, the District is concerned with more stringent nitrogen effluent limits in the future and would prefer to replace it with a suspended growth treatment system to improve BOD reduction and facilitate nitrogen removal. Nitrogen removal will likely drive future waste discharge requirements.

With the existing trickling filter in place, three aerated basins would be constructed that include anoxic zones for nitrogen reduction. Ancillary facilities include recycle pumps and blowers. Each of

the three basins are assumed to measure 312 feet long by 45 feet wide by 18 feet deep and be constructed of reinforced concrete. Recycle pumps and blowers would be housed in a separate building to protect them from the elements and mitigate sound.

At the District's option, the trickling filter can physically remain in place until such time as a fourth primary clarifier needs to be added to the plant. Costs for the waste activated sludge treatment system are included in **Tables 10-2 and 10-3**.

10.9 Additional Secondary Clarifiers

To provide settling capacity for sludge removal, 3 secondary clarifiers would be constructed. The secondary clarifiers would provide increased settling capacity as well as redundancy to the system.

The secondary clarifiers would be similar to the existing size and operation of the existing secondary clarifier. Dimensions are assumed to be 120-ft diameter and 12-ft side water depth at the tank walls. Construction would include scrapers and scum baffles as well as all other required appurtenances. Costs for the secondary clarifiers are included in **Tables 10-2 and 10-3**.

10.10 Additional Digesters & Solids Handling

As flows to the plant increase as well as the addition of an activated sludge process, the increase in sludge produced will require additional treatment and solids handling capacity. This plan assumes that the District will continue to anaerobically digest the sludge and harvest the biogas for beneficial use on the site.

For the WWTP expansion to 12 MGD, the District would construct a waste activated sludge (WAS) thickening facility. They would also expand the existing anaerobic treatment capacity by adding a primary digester with a fixed roof and a secondary digester with a floating cover for gas storage. The District would also convert the existing digesters into sludge holding tanks as part of the solids handling process. Each of the new digesters would have a capacity of 500,000 gallons. The digesters would be equipped with mixing equipment, heat exchangers, and pumps.

With the expansion to 12 MGD and the addition of the activated sludge process, at least one and possibly two screw presses will need to be added for dewatering the digested sludge. The District currently operates a single screw press for dewatering digested solids.

This plan assumes the installation of a second screw press to operate in parallel with the current screw press. The screw press is assumed to be an identical model to the existing one. The screw press will also require a new flocculation tank and conveyor.

For the foreseeable future, the sludge storage basins used for storing dewatered, digested sludge will not be expanded. With the increase in solids production, the District will need to incorporate either regular haul off or increased land application of the biosolids rather than storing the solids on site. Costs for these new facilities are included in **Tables 10-2 and 10-3**.

10.11 Cogeneration Improvements

Currently, the micro turbines are not operable so the District is using the gas in the boiler as well as flaring the excess. The boiler provides heat to the digesters to increase the production of biogas and improve the reduction of volatile suspended solids in the sludge. Currently, the digesters produce an average of 50,000 cfd of biogas. When completed, the expansion of the anaerobic digesters would provide an average of 100,000 cfd of biogas.

The additional biogas will be utilized to provide heat to the new digesters. The gas conditioning facilities will need to be expanded to clean the additional gas. This plan assumes the removal of the microturbines and installation of two (2) new boilers to convert the biogas into heat for the digester facilities. Hot water pumps will also be added.

10.12 Solar

In order to generate additional energy and reduce power costs for the WWTP, the District could consider installation of solar panels on unused parcels at the WWTP. According to a technical report titled “Land-Use Requirements for Solar Plants in the United States” by the National Renewable Energy Laboratory, the production of one megawatt (MW) requires approximately 8 acres of solar panels. The power produced could be used to offset the plant’s electricity use.

The District would evaluate either purchasing nearby desert land to construct solar panels and/or install floating solar panels on the effluent storage ponds.

10.13 Summary of Planned Expansion

Table 10-1 summarizes the new facilities for each planned expansion.

**Table 10-1
NORSD WWTP Expansion Summary**

	Existing	Expansion to			
	7.5 MGD	12 MGD	18 MGD	24 MGD	30 MGD
Year	2018	2022			
Process / Equipment					
Headworks Channels & Screens	2	2	4	4	5
Headworks Pumping Capacity w/ largest out of service	13.2 MGD	21 MGD	33 MGD	44 MGD	55 MGD
Grit Removal Capacity	12 MGD	24 MGD	36 MGD	48 MGD	48 MGD
Primary Clarifiers	1	2	3	4	4
Trickling Filter	1	0	0	0	0
Aeration Basins	0	3	4	6	8
Blowers	0	3	4	6	8
Secondary Clarifiers	1	3	4	6	7
Digesters	2	2	3	4	6
Sludge Holding Tanks	0	2	2	2	2
Screw Presses	1	2	3	4	5

**Table 10-2
NORSW WWTP 12 MGD Expansion Cost Summary**

No.	Description	Qty.	Unit	Unit Cost	Cost
1	Mobilization/Demobilization	1	LS	\$ 2,703,000	\$ 2,703,000
2	New Headworks Pumps Inc. Electrical	1	LS	\$ 650,000	\$ 650,000
3	Grit Facility	2	LS	\$ 625,000	\$ 1,250,000
4	Primary Clarifier	1	LS	\$ 6,250,000	\$ 6,250,000
5	Convert Existing Secondary Clarifier to Primary	1	EA	\$ 185,000	\$ 185,000
6	3 Aeration Basins Inc. Electrical	3	EA	\$ 2,650,000	\$ 7,950,000
7	Blowers and Building	1	LS	\$ 1,700,000	\$ 1,700,000
8	3 Secondary Clarifiers	3	EA	\$ 6,250,000	\$ 18,750,000
9	WAS Thickening	1	LS	\$ 1,500,000	\$ 1,500,000
10	Screw Press	1	LS	\$ 1,861,000	\$ 1,861,000
11	Primary Digester	1	EA	\$ 4,375,000	\$ 4,375,000
12	Secondary Digester	1	EA	\$ 5,000,000	\$ 5,000,000
13	Cogeneration Improvements	1	EA	\$ 1,000,000	\$ 1,000,000
14	Electrical Bldgs	800	SF	\$ 45	\$ 36,000
15	Workshop	5,760	SF	\$ 45	\$ 259,200
16	Office	2,500	SF	\$ 45	\$ 112,500
17	Grading/Paving	1	LS	\$ 800,000	\$ 800,000
18	Yard Piping	1	LS	\$ 1,000,000	\$ 1,000,000
19	Electrical	1	LS	\$ 750,000	\$ 750,000
20	Instrumentation & SCADA	1	LS	\$ 625,000	\$ 625,000
Subtotal					\$ 56,757,000
Contingency (25%)					\$ 14,189,000
Engineering (15%)					\$ 8,514,000
Construction Management (10%)					\$ 5,676,000
Total					\$ 85,136,000

**Table 10-3
NORSW WWTP 18 MGD Expansion Cost Summary**

No.	Description	Qty.	Unit	Unit Cost	Cost
1	Mobilization/Demobilization	1	LS	\$ 1,524,000	\$ 1,524,000
2	Headworks and Grit Facility	1	LS	\$ 4,945,000	\$ 4,945,000
3	Aeration Basin	1	EA	\$ 2,650,000	\$ 2,650,000
4	Blower	1	LS	\$ 400,000	\$ 400,000
5	Secondary Clarifier	1	EA	\$ 6,250,000	\$ 6,250,000
6	WAS Thickening	1	LS	\$ 1,500,000	\$ 1,500,000
7	Screw Press	1	LS	\$ 1,861,000	\$ 1,861,000
8	Primary Digester	1	EA	\$ 4,375,000	\$ 4,375,000
9	Secondary Digester	1	EA	\$ 5,000,000	\$ 5,000,000
10	Convert 2 Digesters to Sludge Holding Tanks	1	EA	\$ 500,000	\$ 500,000
11	Grading/Paving	1	LS	\$ 625,000	\$ 625,000
12	Yard Piping	1	LS	\$ 1,000,000	\$ 1,000,000
13	Electrical	1	LS	\$ 750,000	\$ 750,000
14	Instrumentation & SCADA	1	LS	\$ 625,000	\$ 625,000

Subtotal	\$ 32,005,000
Contingency (25%)	\$ 8,001,000
Engineering (15%)	\$ 4,801,000
Construction Management (10%)	\$ 3,201,000
Total	\$ 48,008,000

Appendix A
1990 Joint Powers Agreement
&
Cooperative Agreement Between the City
of Shafter and North of
River Sanitary District Regarding Sewer
Capacity

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 10th 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 "NORS"), 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, NORS, 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, also known as "CSA 71", to provide for the collection, treatment, and disposal of wastewater produced within its boundaries and the construction and maintenance of facilities therefor; and,

WHEREAS, it has been shown that a regional sewerage system, as hereinafter described, is needed to serve a portion of CSA 71; and

WHEREAS, NORSD has determined that it is in NORSD's best interest to relocate its wastewater treatment plant and disposal facilities from its present location to a site farther to the west and remote from present or planned development; and,

WHEREAS, SHAFER has determined that its present wastewater treatment plant and disposal facilities need to be replaced in a new location remote from present and planned future development; and,

WHEREAS, under the provisions of California Government Code sections 6500 through 6583, and California Health and Safety Code sections 6512, 6515, 6520.3, and 6522, NORSD, COUNTY, and SHAFER may join in a Joint Exercise of Powers Agreement, hereinafter referred to as "JPA" or "Agreement",

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:

The SHAFTER SEWER will extend from Shafter's present wastewater treatment plant to a point of connection with the NORRIS/SEVENTH STANDARD SEWER. The SHAFTER SEWER is not part of the project facilities.

SECTION 2: PROJECT CONSTRUCTION PHASING:

It has been determined by each of the three parties to this agreement that the project facilities be constructed and placed into operation as quickly as possible. Due to financial limitations, it is the parties intent that the improvements be constructed in two or more phases. The goal for completion of construction of the NORRIS/SEVENTH STANDARD SEWER is January 1, 1991.

The wastewater treatment plant and disposal facilities may be constructed in one or more phases depending on the flows to be treated and the financing available. The goal for completion of construction of the first phase of the wastewater treatment plant is January 1, 2000.

If the first phase of the wastewater treatment plant is not constructed and operational by January 1, 2010, the COUNTY may request that NORSD return the amount of money which the COUNTY paid, for the construction of the NORRIS/SEVENTH STANDARD SEWER pursuant to this JPA, including but not limited to the initial \$2,500,000

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.

"Total Cost" shall include all costs associated with a reach, 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 Right" is the share of the actual capacity of the sewer after the sewer is placed in service.

For the reach of the NORRIS/SEVENTH STANDARD SEWER from the SHAFTER sewer westerly, the capacity rights and total costs shall be allocated as follows:

NORSD = 1/2 (est. 6 mgd)
CSA 71 = 1/4 (est. 3 mgd)
SHAFTER = 1/4 (est. 3 mgd)

For the reach of the NORRIS/SEVENTH STANDARD SEWER from the SHAFTER SEWER easterly to Jenkins Road, the capacity rights and total costs shall be allocated as follows:

NORSD = 2/3 (est. 6 mgd)
CSA 71 = 1/3 (est. 3 mgd)

For the reach of the NORRIS/SEVENTH STANDARD SEWER easterly of Jenkins Road, the capacity rights and total costs shall be allocated entirely to NORSD.

SHAFTER 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

to be paid to NORSD shall be in the same amount as NORSD charges to equivalent sewer users in its own District for the purchase of capacity in the wastewater treatment plant and disposal facilities which are the subject of this JPA. The connection fees to be paid to NORSD for sewer users in CSA 71 shall not include any other amounts, including, but not limited to, the amount which NORSD charges for purchase of capacity in the sewer trunk or sewer collection system. It shall be the responsibility of NORSD to maintain adequate reserve capacity in the wastewater treatment plant for users in CSA 71. However, it shall be the responsibility of COUNTY to monitor and control the rate at which new sewer connections are made so as to allow NORSD adequate response time in which to expand the wastewater treatment plant capacity accordingly.

TRANSFER OF CAPACITY RIGHTS:

With respect to the NORRIS/SEVENTH STANDARD SEWER, the capacity rights of NORSD, Shafter, and COUNTY are as previously defined in this Section.

With respect to the treatment and disposal facilities, each party to this JPA will negotiate in good faith prior to initial design and construction as to what capacity it wishes to have.

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:

NORSB 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 NORSB 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:

Of the three Parties to this Joint Powers Agreement, NORSD shall be the lead agency and have responsibility and authority for operating and maintaining the NORRIS/SEVENTH STANDARD SEWER and the wastewater treatment and disposal facilities. To facilitate planning and design, and for later administration, there shall be formed, upon execution of this Agreement, a Technical Advisory Committee (TAC) consisting of at least one member from each Party to this Agreement. The NORSD representative will assume the chairmanship of the TAC and the SHAPTER representative will serve as secretary. The primary purpose of the TAC is to review, discuss and evaluate the ongoing impact of the Joint Powers Agreement on the respective parties and make recommendations to NORSD, and to the parties' respective governing bodies. Secondly, the TAC shall assist NORSD in formulating and implementing such matters as sewer use ordinances, rate structures and future expansion of facilities. The chairman shall keep members informed of important project events and shall convene meetings when so requested by any of the Parties to this Agreement. The secretary shall keep minutes of the major discussion items for the TAC meetings and distribute those minutes to the Parties.

SECTION 6 - FINANCING CONSTRUCTION

The construction cost of the NORRIS/SEVENTH STANDARD SEWER, presently proposed to be in operation by January 1, 1991, is approximately \$15 million. The County of Kern has allocated to CSA 71 the sum of

\$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.

COUNTY has appropriated the initial payment of \$2,500,000 noted above for the construction of the NORRIS/SEVENTH STANDARD SEWER. Prior to paying any of COUNTY'S other financial obligations under this JPA, the Board of Supervisors of County must appropriate sufficient funds to meet those obligations. Accordingly, notwithstanding any other term or condition of this JPA, if the Board of Supervisors of COUNTY fails to appropriate sufficient funds to meet any of its financial obligations under this JPA, COUNTY shall not be obligated to meet those obligations and shall not pay any penalties or incur any liability or expense as a result of the Board of Supervisor's failure to appropriate sufficient funds. However, shall the Board of Supervisors not appropriate sufficient funds to reimburse NORSD for services provided under the terms of this agreement, NORSD reserves the right to discontinue services not paid for.

The treatment plant and disposal facilities shall be built as required and as financing becomes available. As with the NORRIS/SEVENTH STANDARD SEWER, NORSD may arrange for any debt financing used to fund construction of the treatment plant and disposal facilities. However, Shafter, at its election, may fund its share of any portion of these facilities through methods separate from NORSD and/or COUNTY.

It is anticipated that construction of a significant portion of the project facilities will be funded with monies received from the sale of NORSD's present treatment plant and disposal site. NORSD's

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.

SECTION 7 - NORSD TO ACT AS OPERATING ENTITY

NORSD shall administer, operate and maintain the project facilities, and administer and supervise the construction and installation of the project facilities, subject to the terms and conditions of this JPA, NORSD expressly accepts responsibility and liability for any operation or maintenance task necessary to maintain the project facilities in an operational condition. NORSD shall perform all of its obligations under this JPA in a reasonable, competent, and diligent manner and shall comply with all laws and regulations pertaining to the project facilities.

NORSD shall prepare preliminary and final JPA budgets for the year following execution of this agreement and every year thereafter for review by the three Parties to this agreement. The preliminary budget shall be submitted to Shafter and COUNTY no later than the 1st day of February prior to the fiscal year and the proposed final budget shall be submitted no later than three weeks prior to the start of budget hearings of any of the three Parties. Included in the budget submissions shall be estimates of O&M and capital charges to each Party. Where Equivalent Single Family Dwellings (ESFD), or other such factors, are used as a basis for charges, the current ESFD for each Party shall be included in the budget submissions. Any party to this agreement with objections to the final budget may seek resolution of the disagreement pursuant to the arbitration conditions of this agreement.

NORS D shall have the authority and the right to meet budgeted O&M expenses without further approval or concurrence by COUNTY or SHAF TER. NORS D 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, NORS D 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. NORS D'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, NORS D 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, NORS D shall reconcile payments made as

compared to actual expenditures and shall make whatever added billing or credit is indicated by the reconciliation. Such payments to NORSD shall be made within 45 days of the billing by NORSD if paid quarterly or 20 days if paid monthly. Payments made thereafter or reimbursement of disputed payments under this agreement shall include interest payments at the rate of 8 percent per annum for the period of late payment or dispute. Upon notification in writing to NORSD of a dispute concerning the amount of payment by a party hereto, scheduled payments shall be made to NORSD pending settlement of the dispute.

NORSD agrees to indemnify and to hold COUNTY and SHAFTER 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 NORSD or its agents, officers, directors, servants or employees, and each of them, in connection with the rights and duties granted in this agreement to NORSD or in connection with the operation and or maintenance of NORSD's separate sewerage systems.

COUNTY agrees to indemnify and to hold NORSD and SHAFTER 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 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.

All insurance under this JPA shall be underwritten by responsible insurers authorized to do business in the State of California.

No party to this agreement or any officer or employee thereof, shall be responsible for any damage or liability by reasons of anything done or omitted to be done by another party to this agreement, or any officer or employee thereof, in connection with any work, authority or jurisdiction delegated to another party under this agreement.

SECTION 8 - OPERATION AND MAINTENANCE COST ALLOCATION

The O&M costs will be allocated to NORSD, COUNTY, and SHAFER annually on the following basis for each separate and identifiable facility, ie., sewer, treatment plant and disposal facilities.

FIXED COSTS - fixed costs are those costs not directly related to flow including, but not limited to:

1. Liability and property insurance
2. Repairs to project facilities
3. Replacement

It is probable that some part, or parts, of the project facilities will begin operation part way through a calendar year. In such an instance, an estimate will be made as to the "startup" date of the new facility and the "fixed costs" for the new facility allocated to

the entities (NORS, COUNTY, or SHAFER) 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

Variable costs shall be allocated to each party based on their prorata share of the solids-weighted flow conveyed, treated, or disposed of, as applicable, by each of the several project facilities. Testing of each parties' flow shall be done to determine the percentage of solids to be disposed of and charged accordingly.

To facilitate O&M variable cost allocation among NORSD, COUNTY, and SHAFTER, there shall be three flow meters installed at any or all of the following locations (see Exhibit A):

1. At Jenkins Road on the NORRIS/SEVENTH STANDARD SEWER (Meter No. 1);
2. In the Shafter Sewer where it connects to the NORRIS/SEVENTH STANDARD SEWER (Meter No. 2);
3. At the headworks to the proposed wastewater treatment plant (Meter No. 3).

The flows upon which the O&M costs shall be allocated to NORSD, COUNTY, and SHAFTER shall be calculated as follows:

1. NORSD - the flow measured by Meter No. 1;
2. SHAFTER - the flow measured by Meter No. 2;
3. CSA 71 - the flow measured by Meter No. 3 less the sum of the flows measured by Meter Nos. 1 and 2. However, COUNTY shall have the option of submitting actual flow measurements

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

audit shall be submitted to the governing bodies of NORSD, COUNTY, and SHAFTER for acceptance and filing.

The cost of the annual audits shall be allocated amongst NORSD, COUNTY and SHAFTER as a "fixed cost" as described in Section 8.

SECTION 10 - TRANSFER OF RIGHTS AND RESPONSIBILITIES

Any party to this JPA may assign its rights and delegate its duties to another political entity. Such assignment and delegation shall be "in toto" only and the political entity to which the transfer is made shall be bound by this JPA in its entirety including any amendments thereto, and all policies, ordinances, rules, and regulations applicable to the facilities covered under this JPA. Where, because of annexation, only a portion of the service area of a Party herein is transferred to another political entity, that other political entity shall not thereupon become a Party to this JPA but, rather, shall achieve representation through the original political entity that is a signatory to this agreement.

SECTION 11 - SEWER USE MODEL ORDINANCE

The TAC shall develop a Sewer Use Model Ordinance, hereinafter called ORDINANCE, for adoption by each party's "governing body". Following approval by the governing bodies of NORSD, COUNTY, and SHAFTER, of separate sewer ordinances which meet or exceed the requirements of

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

NORSB, COUNTY, and SHAFER 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

sold. For purposes of this Section, COUNTY shall be considered to have a share of capacity and capacity rights in the facility for any such capacity for which COUNTY has paid through direct payment, connection fees or other means.

If PROJECT FACILITIES are expanded, the capital cost of such expansion shall be borne by the entities which will own capacity in the expansion in proportion to each entities' capacity rights in the expansion.

If any PROJECT FACILITY is replaced or bettered, the capital cost of such replacement or betterment shall be borne by the parties to this JPA in proportion to each entities' capacity right in the facility replaced or bettered. The residual value of the replaced or bettered facility to each entity shall be mutually agreed to and proportionately applied to the capital cost of said replacement or betterment. Residual value shall include but not be limited to the remaining useful life of said facility.

SECTION 14 - DEPRECIATION OF PROJECT FACILITIES

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

thereof to either or several Parties or any other person or circumstance be, is or was held invalid.

SECTION 17 - AMENDMENTS AND SUPPLEMENTS:

This contract is an integrated agreement containing the entire agreement between these contracting parties. This agreement may only be modified, amended, rescinded, terminated, or supplemented by a duly executed written agreement which is authorized by the governing bodies of the respective Parties hereto.

This JPA shall continue in effect until it is rescinded or terminated by the parties hereto.

SECTION 18 - NOTICES:

Any notices to be given by either party to the other may be effected either by personal delivery in writing to the addresses noted below or by mail, registered or certified, postage pre-paid with return receipt requested, to the addresses noted below. Each party may change addresses only by written notice in accordance with this section. Notices delivered personally shall be deemed communicated as of the day of actual receipt; mailed notices shall be deemed communicated as of the day of mailing.

NORSB: 5001 Olive Dr.	SHAFTER: 320 James	COUNTY: 2700 M	Suit 500
Bakersfield	Shafter	Bakersfield	
93308	93263	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.

CITY OF SHAFTER:

APPROVED AS TO FORM:

By John Brown S/S
City Attorney

APPROVED AS TO CONTENT:

By J. D. Guinn
John D. Guinn
Public Works Director

By Cathy L. Prout
Cathy L. Prout
Mayor

COUNTY OF KERN:

APPROVED AS TO FORM:

By J. L. A. A.
Deputy-County Counsel

APPROVED AS TO CONTENT:

By L. W. ...
Director of Public Works

By Paul ...
Chairman Board of Supervisors

NORTH OF RIVER SANITARY DISTRICT:

APPROVED AS TO FORM:

By _____

District's Attorney

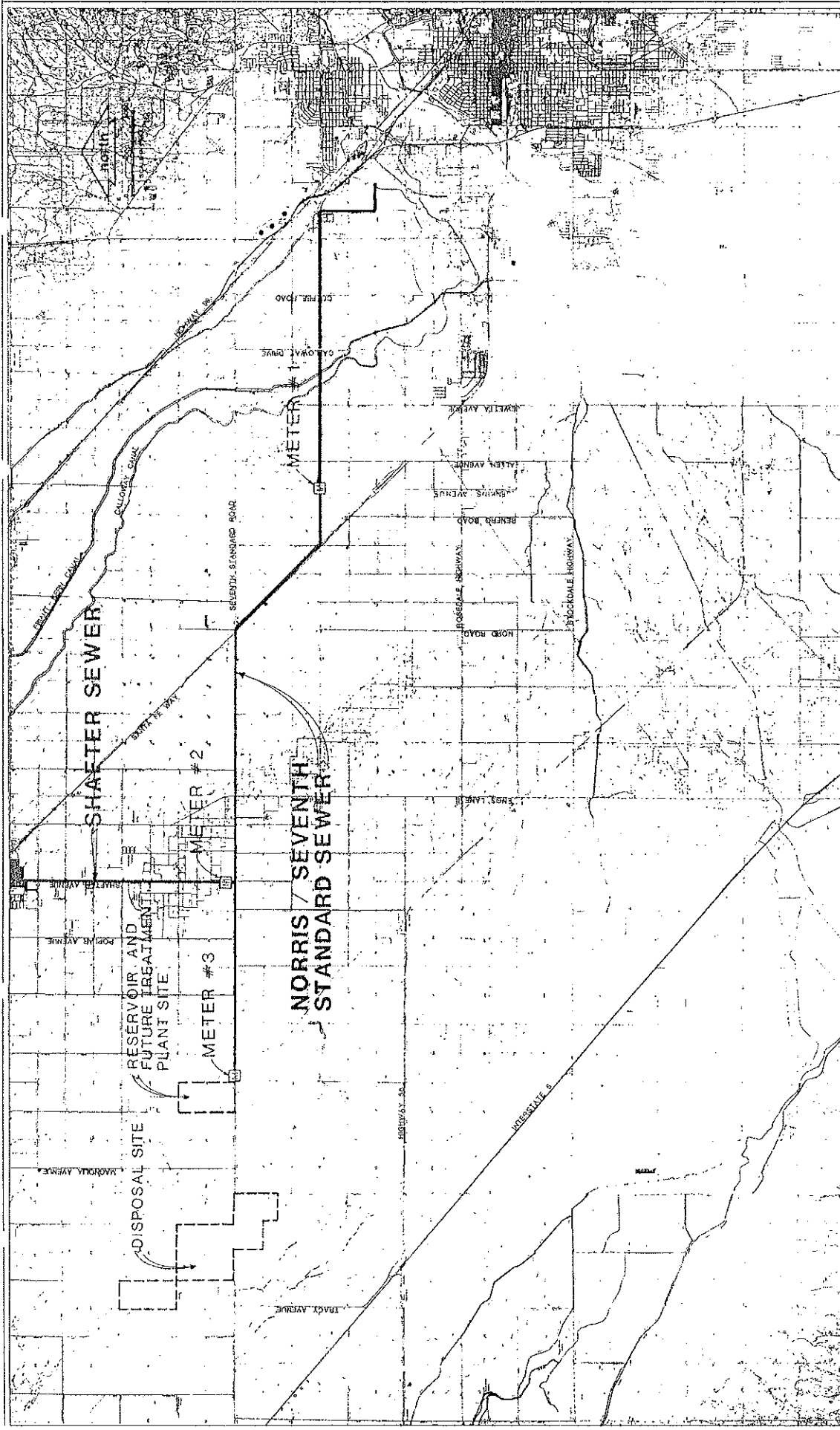
APPROVED AS TO CONTENT:

By _____

General Manager

By _____

President



NORTH OF RIVER SANITARY DISTRICT NO. 1
**EXHIBIT "A" TO JPA BETWEEN
 NORRIS, CSA-71, & SHAFTER**




COOPERATIVE AGREEMENT BETWEEN THE CITY OF SHAFTER AND NORTH OF RIVER SANITARY DISTRICT REGARDING SEWER CAPACITY

This COOPERATIVE AGREEMENT (“Agreement”) by and between CITY OF SHAFTER, a municipal corporation (“SHAFTER”) and NORTH OF RIVER SANITARY DISTRICT NO. 1, a special district of the State of California (“NORS”) is made and entered into as of the 17th day of March, 2015 (“Effective Date”). SHAFTER and NORS are sometimes individually referred to as “Party” and collectively as “Parties.”

1. RECITALS

1.1 WHEREAS, SHAFTER and NORS are owners of a sewage treatment plant and sewage collection facilities (“Sewer Facilities”) as described in a Joint Powers Agreement (“JPA”) dated February 6, 1990; and

1.2 WHEREAS, the JPA outlines NORS’s and SHAFTER’s designated sewer capacity in each of the Sewer Facilities and their share of costs related to improvements to the Sewer Facilities; and

1.3 WHEREAS, in October 2006, NORS installed a ferric chloride chemical feeding system to the Sewer Facilities and, in January 2008, installed a polymer feed system. NORS has also made other historical improvements to the Sewer Facilities for which NORS and SHAFTER must pay their proportionate share of the cost as provided under the JPA. NORS has incurred a total cost of seven million, ninety nine thousand, nine hundred twenty one dollars and seventy cents (\$7,099,921.70) for these improvements (collectively “Improvements”) as of the Effective Date and has delivered to SHAFTER an invoice with supporting documentation for payment of SHAFTER’s share of the costs for the Improvements in the amount of two million, three hundred forty two thousand, nine hundred seventy four dollars and sixteen cents (\$2,342,974.16); and

1.4 WHEREAS, the Improvements increased the total sewer capacity for the sewage treatment plant from 5.5 to 7.5 million gallons per day (“MGD”), which is allocated under the JPA as follows: one-third (1/3 or 2.5 MGD) to SHAFTER and two-thirds (2/3 or 5 MGD) to NORS; and

1.5 WHEREAS, SHAFTER currently utilizes approximately 1.3 MGD and NORS utilizes 4.2 MGD of the sewage treatment plant capacity; and

1.6 WHEREAS, on August 13, 2009, the Central Valley Regional Water Quality Control Board adopted a new Waste Discharge Requirements Permit (“WDR Permit”) for the sewage treatment plant through Order No. R5-2009-0088, recognizing the newly increased capacity; and

1.7 WHEREAS, at present, SHAFTER does not have adequate sewer collection facilities to serve certain new residential developments and NORS may not have adequate sewage treatment plant capacity sufficient to handle the anticipated growth in its service area beyond five (5) years; and

1.8 WHEREAS, although the Parties have considered a number of expensive solutions to manage this situation they have agreed in principle to cooperate and share costs, in accordance with the JPA, to line the ponds at the sewer treatment plant, if ultimately required by the State, as an interim solution to defer the cost of new plant construction and to allow the Parties to build reserves, better utilize their existing assets, and reduce eventual financing costs; and

1.9 WHEREAS, SHAFTER now desires to pay NORS its share of the costs for the installation of the Improvements and to lease a portion of NORS’s excess sewer collection capacity for

its residential developments. SHAFTER will permit NORSD to utilize SHAFTER's excess sewer treatment capacity. No new master sewer plan or associated fee study is expected to be required as a result of this Agreement; and

1.10 WHEREAS, the JPA authorizes the Parties to enter into this Agreement. The parties to the JPA met on December 15, 2014 for a Technical Advisory Committee meeting to discuss this Agreement, at which time the County of Kern expressed no opposition to this Agreement.

NOW, THEREFORE, in consideration of the above recitals and the mutual covenants hereinafter contained and for good and valuable consideration, the receipt of which is hereby acknowledged, the Parties agree as follows:

2. TERMS OF AGREEMENT

2.1 Incorporation of Recitals. The Parties hereby affirm the facts set forth in the Recitals above. Said Recitals are incorporated into this Agreement by this reference.

2.2 Improvements. SHAFTER shall participate in the costs of the Improvements, and all current and future improvements to the Sewer Facilities, according to its one-third (1/3) share as provided under the JPA. In exchange, SHAFTER shall be allocated its full one-third (1/3) share in the additional sewer treatment plant capacity as provided under the JPA. The new sewer treatment plant capacity is estimated at 7.5 MGD. As a result, SHAFTER shall possess rights to 2.5 MGD and NORSD shall possess rights to 5.0 MGD of the capacity of the sewer treatment plant. The purpose of this section 2.2 is to confirm the Parties' understanding of the JPA rather than create any new or different obligation or interpretation under the JPA.

2.2.1 SHAFTER acknowledges receipt of NORSD's invoice in the amount of two million, three hundred forty two thousand, nine hundred seventy four dollars and sixteen cents dollars (\$2,342,974.16), and a record of all direct costs associated with that invoice, constituting SHAFTER's one-third (1/3) share of the cost of the Improvements incurred by NORSD prior to the Effective Date. Payment of this sum by SHAFTER to NORSD does not relieve SHAFTER of its ongoing obligation under the JPA to participate in the improvement costs for the Sewer Facilities. The purpose of this payment is to bring current SHAFTER's obligation to pay (and NORSD's obligation to invoice) its proportionate share of the improvement costs for the Sewer Facilities as required under the JPA. The JPA will continue to govern SHAFTER's obligation to participate in those costs arising after the Effective Date.

2.2.2 SHAFTER shall pay said invoice in full within thirty (30) days following the Effective Date.

2.3 WDR Permit. SHAFTER and NORSD will continue to work diligently and cooperatively under the JPA to ensure compliance with the WDR Permit for the sewage treatment plant, issued on August 13, 2009 by the Central Valley Regional Water Quality Control Board through Order No. R5-2009-0088. Particularly, the Parties will monitor the need to address possible nitrogen contamination closely, although presently it is understood that the treatment plant's discharge is not affecting surrounding nitrogen levels.

2.4 Sewer Collection Capacity.

2.4.1 NORSD shall lease to SHAFTER the right to utilize up to 0.5 MGD of NORSD's excess sewer collection capacity in the pipeline between the point of connection west of the BNSF railway at Santa Fe Way and 7th Standard Road and the new residential developments north of 7th Standard Road and east of the Calloway Canal. The rate for such lease shall be billed monthly and based

on the average daily flow over the prior month measured by a meter installed pursuant to Section 2.4.2 at a location to be mutually agreed upon by both Parties. The daily flow, measured in thousands of gallons, for each day of the month will be added together and divided by the total number of days in that month. The resulting average daily flow (in thousands of gallons) for that month will then be multiplied by thirty two cents (\$0.32) ("Lease Fee") to determine the amount owed for that month beginning on the Effective Date of this Agreement. NORSD shall submit to SHAFTER a monthly invoice by the 15th of the month immediately following the month for which the average daily flow was calculated. SHAFTER shall then pay said invoice in full within thirty (30) days following its receipt of the invoice provided NORSD has provided information supporting the calculation of the average daily flow. Any amount not paid when due, shall bear interest at the maximum legal rate. Exhibit A, attached hereto and incorporated herein by reference, depicts the stretch of sewer line where SHAFTER may use NORSD's excess collection capacity.

2.4.1.1 Annual Adjustment to Lease Fee. The Lease Fee shall be adjusted on an annual basis on the anniversary date of this Agreement by the same percentage as the then most recent increase, if any, in NORSD's sewer service charge. The annual adjustment of Lease Fee shall be made through official notification letter from NORSD to the SHAFTER stating the new Lease Fee.

2.4.1.2 Responsibility for Operations and Maintenance. The Lease Fee is intended to cover NORSD's operations and maintenance costs for this stretch of pipeline. NORSD remains entirely responsible for the maintenance and operation of this stretch of pipeline and shall not seek any additional compensation or reimbursement from SHAFTER for this purpose. NORSD shall keep the pipeline in a state of good repair at all times and shall expeditiously resolve any problems with the pipeline at its sole cost and expense.

2.4.2 All pipelines south of 7th Standard Road will remain the property of NORSD. SHAFTER's use of pipelines south of 7th Standard Road shall be metered at SHAFTER's cost.

2.5 Sewage Treatment Plant Capacity. SHAFTER shall permit NORSD to utilize up to 0.8 MGD of SHAFTER's excess sewage treatment plant capacity in accordance with NORSD's needs at no cost to NORSD. NORSD will not acquire any ownership interest in the excess capacity by its use of SHAFTER's excess sewage treatment plant capacity. Should NORSD cease its use of any portion of SHAFTER's excess capacity at any time while this Agreement is in force, that excess capacity shall remain the property of SHAFTER.

2.6 Further Cooperation. SHAFTER and NORSD shall continue to coordinate and discuss the future needs of the Sewer Facilities under the JPA, and to assess and discuss the status of the borrowed capacity under this Agreement at least once in every twelve month period. Should the sewer treatment plant's average daily flows reach a combined 6.5 MGD, the Parties shall meet within forty-five (45) days to coordinate future plans for the sewer system. In addition, the Parties agree to meet within forty-five (45) days when the following occur : (1) SHAFTER has utilized 0.2 MGD of NORSD's excess sewer collection capacity in the pipeline south of 7th Standard Road; (2) SHAFTER has utilized 0.4 MGD of NORSD's excess sewer collection capacity in the pipeline south of 7th Standard Road; (3) NORSD has utilized 0.2 MGD of SHAFTER's excess sewer treatment plant capacity; (4) NORSD has utilized 0.4 MGD of SHAFTER's excess sewer treatment plant capacity; and (5) NORSD has utilized 0.6 MGD of SHAFTER's excess sewer treatment plant capacity.

2.7 Term and Termination. This Agreement shall remain in effect as written until January 1, 2027. This Agreement may be terminated sooner, in writing, by mutual agreement of all Parties hereto.

2.8 Party Representatives. SHAFTER hereby designates its Public Works Director, or his or her designee, to act as its representative for the performance of this Agreement ("SHAFTER's Representative"). SHAFTER's Representative shall have the power to act on behalf of SHAFTER for all

purposes under this Agreement. NORSD hereby designates its General Manager, or his or her designee, to act as its representative for the performance of this Agreement (“NORSD’s Representative”). NORSD’s Representative shall have full authority to represent and act on behalf of NORSD for all purposes under this Agreement.

2.9 Indemnification. SHAFTER and NORSD shall defend, indemnify and hold the other Party, its officials, officers, employees, authorized volunteers and agents free and harmless from any and all claims, demands, causes of action, costs, expenses, liability, loss, damage or injury of any kind, in law or equity, to property or persons, including wrongful death, to the extent arising out of or incident to any intentional or negligent acts, errors or omissions of the indemnifying Party, its officials, officers, employees, authorized volunteers or agents in the performance of any activity pursuant to this Agreement, including and without limitation the payment of all consequential damages and reasonable attorneys’ fees, expert witness fees and other related costs and expenses of defense. The sole exception to the indemnifying Party’s obligation to indemnify shall be for acts of negligence or willful misconduct of the indemnified Party, its officials, officers, employees, authorized volunteers or agents. This is a comparative negligence provision and each Party shall bear its own costs to the extent to which they are each negligent. The indemnifying Party shall defend, at its own cost, expense and risk, with counsel acceptable to the indemnifying Party, any and all such aforesaid suits, actions or other legal proceedings of every kind that may be brought or instituted against the indemnified Party, its officials, officers, employees, authorized volunteers and agents. The indemnifying Party shall pay and satisfy any judgment, award or decree that may be rendered against the indemnified Party, its officials, officers, employees, authorized volunteers and agents in any such suits, actions or other legal proceedings. Each Party’s obligation to indemnify shall not be restricted to insurance proceeds, if any, received by SHAFTER or NORSD, their officials, officers, employees, authorized volunteers and agents.

3. MISCELLANEOUS TERMS

3.1 Amendment. This Agreement may be amended at any time by the mutual consent of the Parties by an instrument in writing signed by both Parties.

3.2 Disputes. In the event that any dispute between the Parties arises under this Agreement, the Parties shall first attempt to resolve such dispute at the management level. If the dispute is not resolved at this level within a mutually acceptable period of time (not to exceed 30 calendar days from the date written notice of such dispute is delivered by any Party), the Parties shall attempt to resolve the dispute at the senior management level. If this process and the involvement of senior management does not result in resolution of the dispute within 45 days from the date of referral to upper management, then the dispute shall be referred to and finally resolved through legal proceedings.

3.3 Construction; References; Captions. Since the Parties or their agents have participated fully in the preparation of this Agreement, the language of this Agreement shall be construed simply, according to its fair meaning, and not strictly for or against any Party. Any term referencing time, days or period for performance shall be deemed calendar days and not work days. The captions of the various articles and paragraphs are for convenience and ease of reference only, and do not define, limit, augment, or describe the scope, content, or intent of this Agreement.

3.4 Entire Agreement. This Agreement constitutes the entire and integrated agreement of SHAFTER and NORSD with respect to the subject matter hereof and supersedes any and all prior and contemporaneous oral or written negotiations, representations or agreements.

3.5 Notices, Demands and Communications Between the Parties.

Formal notices, demands and communications between SHAFTER and NORSD shall be deemed

sufficiently given if: (i) by commercial overnight delivery; (ii) by messenger service for immediate personal delivery; or (iii) by electronic transmittal, including electronic mail and/or fax transmissions, subject to written verification of receipt by the receiving party. Such written notices, demands and communications may be sent in the same manner to such other addresses as either Party may from time to time designate by written notice to the other Party.

All notices, demands and communications shall be sent, as follows:

TO SHAFTER:

City of Shafter
Attn: City Manager
336 Pacific Avenue
Shafter, CA 93263

Copy to:

Best Best & Krieger LLP
Attn: City Attorney – City of Shafter
2855 E. Guasti Road, Suite 400
Ontario, CA 91764

TO NORSD:

North of River Sanitary District
Attn: General Manager
204 Universe Avenue
Bakersfield, CA 93308

Copy to:

Klein, DeNatale, Goldner, Cooper,
Rosenlieb & Kimball, LLP
Attn: General Counsel – NORSD
4550 California Avenue
Second Floor.
Bakersfield, CA 93309
P.O. Box 11172
Bakersfield, CA 93389-1172

Notices shall be deemed effective upon receipt or with respect to electronic transmission, upon receipt of written verification from the receiving Party.

3.6 Counterparts. This Agreement may be signed in counterparts, each of which shall constitute an original.

3.7 Attorneys' Fees. Except as otherwise expressly provided herein, each Party who files any action or brings any action or proceeding against the other arising from this Agreement, seeks resolution of disputes pursuant to this Agreement or is made a party to any action or proceeding brought by any other person or governmental entity, shall bear its own costs and fees.

3.8 Laws and Regulations. Each Party shall keep itself fully informed of and in compliance with all local, state and federal laws, rules and regulations in any manner affecting the performance of this Agreement, and shall give all notices required by law. Each Party shall be liable for all violations of such laws and regulations in connection with this Agreement. If either Party performs any of its obligations hereunder knowing that its actions are contrary to such laws, rules and regulations and without giving written notice to the other, the violating Party shall be solely responsible for all costs arising therefrom. The violating Party shall defend, indemnify and hold the other, its officials, directors, officers, employees and agents free and harmless, pursuant to the indemnification provisions of this Agreement, from any claim or liability arising out of any failure or alleged failure to comply with such laws, rules or regulations.

3.9 Approvals. Approvals required of SHAFTER or the NORSD, or any officers, agents or employees of either Party, shall not be unreasonably withheld and approval or disapproval shall be given within a reasonable time.

3.10 Further Actions and Instruments. Each of the Parties shall cooperate with and provide

reasonable assistance to the other to the extent contemplated hereunder in the performance of all obligations under this Agreement and the satisfaction of the conditions of this Agreement.

3.11 Third Party Beneficiaries. This Agreement and the performance of the Parties obligations hereunder are for the sole and exclusive benefit of SHAFTER and NORSD. No person or entity who or which is not a signatory to this Agreement shall be deemed to be benefited or intended to be benefited by any provision hereof, and no such person or entity shall acquire any rights or causes of action against either SHAFTER or NORSD hereunder as a result of a Party's performance or non-performance of its obligations under this Agreement.

3.12 Governing Law. This Agreement shall be governed by the laws of the State of California without regard to conflicts of laws principles. This Agreement shall be deemed to have been made in the County of Kern, California, regardless of the order of the signatures of the Parties affixed hereto. Any litigation or other legal proceedings which arise under or in connection with this Agreement shall be conducted in a federal or state court located within or for Kern County, California. The Parties consent to the personal jurisdiction and venue in federal or state court located within or for the County of Kern, California and hereby waive any defenses or objections thereto including defenses based on the doctrine of forum non conveniens.

3.13 Waiver. No delay or omission in the exercise of any right or remedy of a non-defaulting Party on any default shall impair such right or remedy or be construed as a waiver. Either Parties' consent or approval of any act by the other Party requiring its consent or approval shall not be deemed to waive or render unnecessary its consent to or approval of any subsequent act of the other Party. Any waiver by either Party of any default must be in writing and shall not be a waiver of any other default concerning the same or any other provision of this Agreement.

3.14 Rights and Remedies are Cumulative. Except with respect to rights and remedies expressly declared to be exclusive in this Agreement, the rights and remedies of the Parties are cumulative and the exercise by either Party of one or more of such rights or remedies shall not preclude the exercise by it, at the same or different times, of any other rights or remedies for the same default or any other default by the other Party. All warranties and promises to indemnify shall survive the termination, abandonment, or completion of this Agreement.

3.15 Legal Counsel. Each Party acknowledges that: (i) it has read this Agreement; (ii) it has had the opportunity to have this Agreement explained to it by legal counsel of its choice; (iii) it is aware of the content and legal effect of this Agreement; and (iv) it is not relying on any representations made by the other Party or any of the employees, agents, representatives, or attorneys of the other Party, except as expressly set forth in this Agreement.

3.16 Severability. In the event that any one or more of the phrases, sentences, clauses, paragraphs, or sections contained in this Agreement shall be declared invalid or unenforceable by a valid judgment or decree of a court of competent jurisdiction, such invalidity or unenforceability shall not affect any of the remaining phrases, sentences, clauses, paragraphs, or sections of this Agreement which are hereby declared as severable and shall be interpreted to carry out the intent of the parties hereunder.

3.17 Binding Effect. The terms of this Agreement shall inure to the benefit of, and shall be binding upon, each of the Parties and their respective successors and assigns.

3.18 Authorized Representatives. The person or persons executing this Agreement on behalf SHAFTER and NORSD, as applicable, warrants and represents that he/she has the authority to execute this Agreement on behalf of that Party and that he/she has the authority to bind that Party to the performance of

its obligations hereunder.

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the dates set forth below.

[SIGNATURES ON THE FOLLOWING PAGE]

**SIGNATURE PAGE
TO
COOPERATIVE AGREEMENT BETWEEN THE CITY OF SHAFTER AND NORTH
OF RIVER SANITARY DISTRICT REGARDING SEWER CAPACITY**

SHAFTER
City of
Shafter

NORS
North of River Sanitary District

By: 
Scott Hurlbert, City Manager

By: 
LaRue Griffin, General Manager

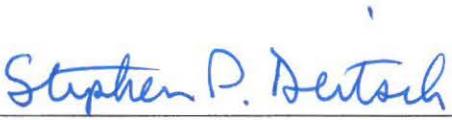
Dated: 3-19-2015

Dated: 3/26/15

APPROVED AS TO LEGAL FORM:

APPROVED AS TO LEGAL FORM:


BEST BEST & KRIEGER LLP

By: 
Stephen P. Deitsch, City Attorney

By: 
General Counsel

ATTEST:

ATTEST:

By: 
Christine Wilson, City Clerk

By: 
District Secretary

EXHIBIT A
MAP OF SEWER COLLECTION LINE

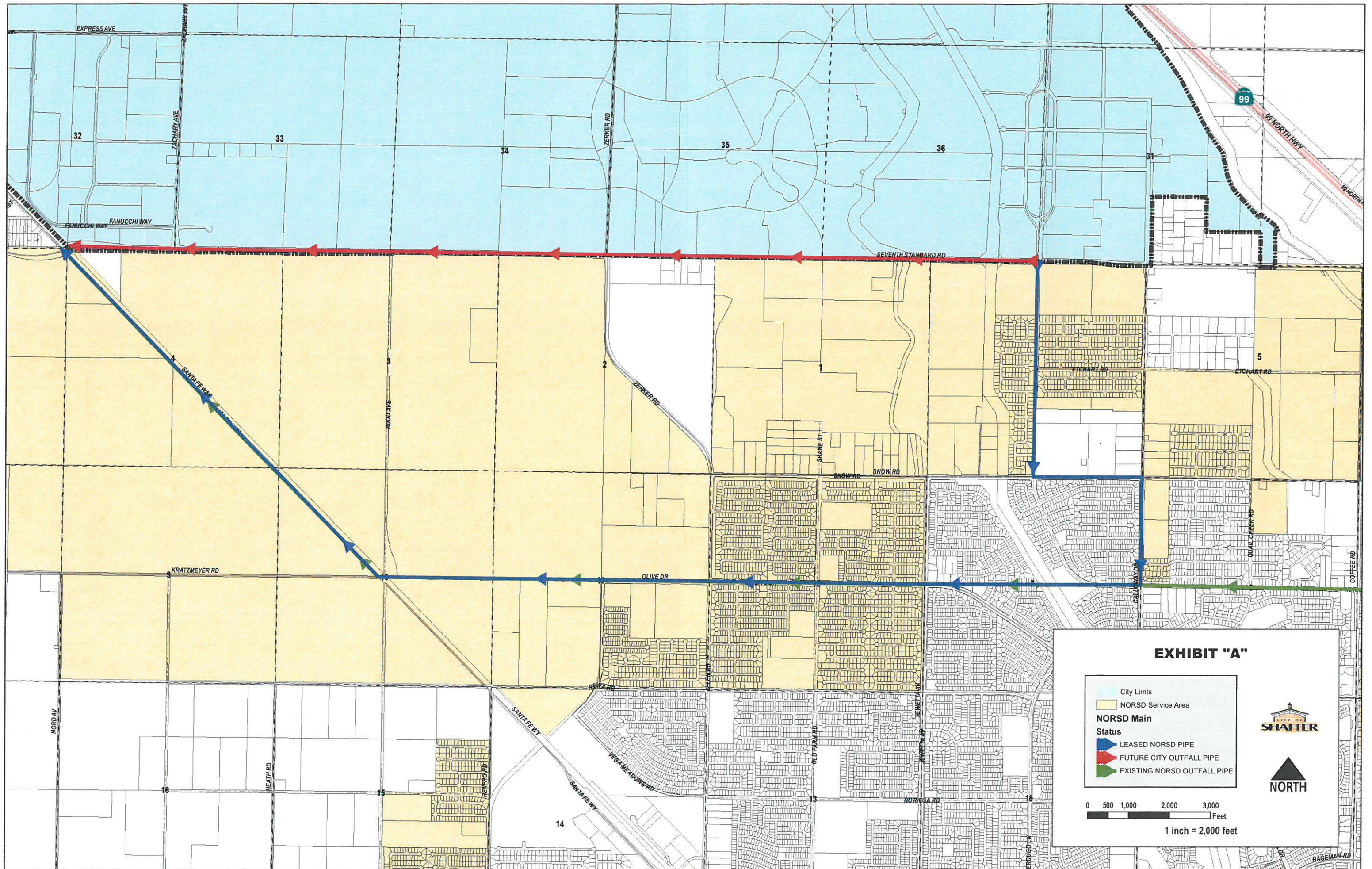


EXHIBIT "A"

	City Limits
	NORSD Service Area
NORSD Main	
Status	
	LEASED NORSD PIPE
	FUTURE CITY OUTFALL PIPE
	EXISTING NORSD OUTFALL PIPE



1 inch = 2,000 feet

Appendix B
Waste Discharge Requirements (Order
No. R5-2011-0011, adopted February 3,
2011)



**California Regional Water Quality Control Board
Central Valley Region
Katherine Hart, Chair**



Linda S. Adams
Acting Secretary for
Environmental Protection

1685 E Street, Fresno, California 93706
(559) 445-5116 • FAX (559) 445-5910
<http://www.waterboards.ca.gov/centralvalley>

Edmund G. Brown Jr.
Governor

16 February 2011

CERTIFIED MAIL
7008 1830 0003 4615 8503

CERTIFIED MAIL
7008 1830 0003 4615 8510

Mr. John LaMar, District Manager
North of River Sanitary District No. 1
204 Universe Avenue
Bakersfield, CA 93308

Mr. Duffy Sill
Sill Properties
1508 18th Street, Suite 320
Bakersfield, CA 93301

**TRANSMITTAL OF ADOPTED ORDERS NORTH OF RIVER SANITARY DISTRICT
NO 1 AND SILL PROPERTIES WASTEWATER TREATMENT FACILITY, KERN
COUNTY**

Enclosed is an official copy of Order No. R5-2011-0011, as adopted by the California Regional Water Quality Control Board, Central Valley Region at its 3 February 2011 meeting.

Within about a week, official copies of the above Orders will be posted on the Regional Board's website at:
http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/

If you have any questions, please contact Denise Soria at (559) 444-2488.


W. DALE HARVEY
Senior Engineer
RCE No. 55628

Enclosures: Order No. R5-2011-0011

California Environmental Protection Agency



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

SPECIAL ORDER NO. R5-2011-0011
MODIFYING WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2009-0088
FOR
NORTH OF RIVER SANITARY DISTRICT NO. 1
AND
SILL PROPERTIES
WASTEWATER TREATMENT FACILITY
KERN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board), finds that:

1. On 13 August 2009, the Central Valley Water Board adopted Waste Discharge Requirements (WDRs) Order No. R5-2009-0088 for North of River Sanitary District No. 1 (District) to regulate its wastewater treatment facility (WWTF) located in the Northwest Quarter of Section 36, Township 28 South, and Range 24 East, MDB&M in Kern County.
2. WDRs Order No. R5-2009-0088 authorize a discharge of 7.5 million gallons per day (mgd) of undisinfected secondary recycled water to four 32.5-acre unlined storage ponds (storage capacity of 1,488 acre-ft) and a Reclamation area of approximately 2,380 acres of farmland, of which 1,740 acres (Assessor's Parcel Nos. 088-210-01, 088-180-02, 088-180-34, 088-180-06, 088-180-07, 088-180-10, 088-180-12, 090-240-01, 090-240-20, 090-240-18, 090-240-21, 090-240-04, 090-140-08, 090-240-08, 090-240-07, 090-240-17, and 090-270-07) are owned and operated by Sill Properties. The other 640 acres (Assessor's Parcel Nos. 088-210-06, and 088-210-05) are owned by the District and operated by Sill Properties.
3. In a letter dated 27 April 2010, the District requested that the Central Valley Water Board revise WDRs Order No. R5-2009-0088 to reflect that Assessor's Parcel No. 090-240-07 (40 acres) be removed from the farmland receiving recycled water as it is no longer owned and operated by Sill Properties. Additionally the District requested to add two new parcels to the farmland receiving recycled water (Assessor's Parcel Nos. 090-240-03 (100 acres) and 090-240-05 (60 acres)). These new parcels are owned and operated by Sill Properties.
4. The new reclamation area reflecting the addition of the new parcels is of approximately 2,500 acres, of which 1,860 acres (Assessor's Parcel Nos. 088-210-01, 088-180-02, 088-180-34, 088-180-06, 088-180-07, 088-180-10, 088-180-12, 090-240-01, 090-240-20, 090-240-18, 090-240-21, 090-240-04, 090-140-08, 090-240-08, 090-240-17, 090-270-07, and 090-240-03, and 090-240-05) are owned and operated by Sill Properties. The other 640 acres (Assessor's Parcel Nos. 088-210-06, and 088-210-05) are owned by the District and operated by Sill Properties. A revised Attachment A Site Map is attached hereto and made part of this Order by reference.

5. The District adopted an Initial Study and Negative Declaration on 18 October 1989, in accordance with the California Environmental Quality Act (CEQA), for the expansion of its WWTF to a capacity of 12 mgd. According to the Negative Declaration, treated wastewater will be used for reclamation on farmland owned by the District, Sill Properties, and possibly other local farmers. Additionally, the Negative Declaration documents the District's expressed interest in purchasing additional land for expansion of the reclamation area.
6. The Central Valley Water Board, as a responsible agency under CEQA regulations at section 15381 of Title 14 of the California Code of Regulations, has reviewed the Initial Study and Negative Declaration and included effluent limits, discharge specifications, groundwater limits, and other provisions and requirements in WDRs Order No. R5-2009-0088 that will be protective of water quality. There is nothing unique or different about the parcels being added to the 2,340 acres that will continue to receive recycled water or the 40 acres that are being removed from the reclamation area; thus, the addition and removal of parcels under this Special Order will have an insignificant impact on water quality, particularly because the reclamation area will be slightly larger and the loading rates to the reclamation areas will be less.
7. The California Department of Public Health (DPH) requires recyclers of treated municipal wastewater to submit an engineering report detailing the use of recycled water, contingency plans, and safeguards, pursuant to section 60323 of Title 22 of the California Code of Regulations.
8. WDRs Order No. R5-2009-0088 includes Provision H.27 requiring the District to submit a Title 22 Engineering Report approved by DPH. A Title 22 Engineering Report dated February 2010 was prepared and submitted to DPH by AECOM on behalf of the District. By letter dated 27 September 2010, DPH notified the Central Valley Water Board that the Title 22 Engineering Report was incomplete. The District needs to update its Title 22 Engineering Report and must address the new parcels with the update.
9. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that pursuant to California Water Code Sections 13263 and 13377, WDRs Order No R5-2009-0088 is amended as follows:

1. Finding No. 8 is revised to reflect the correct reclamation area and Assessor's Parcel Numbers as described in Finding No. 4 of this Order.
2. Wastewater shall not be applied to the newly incorporated parcels until the Discharger provides written documentation that the California Department of Public Health has approved the Title 22 Engineering Report for the reclamation area, including the new parcels.

3. A revised Attachment A Site Map is attached and made part of this Order by reference.

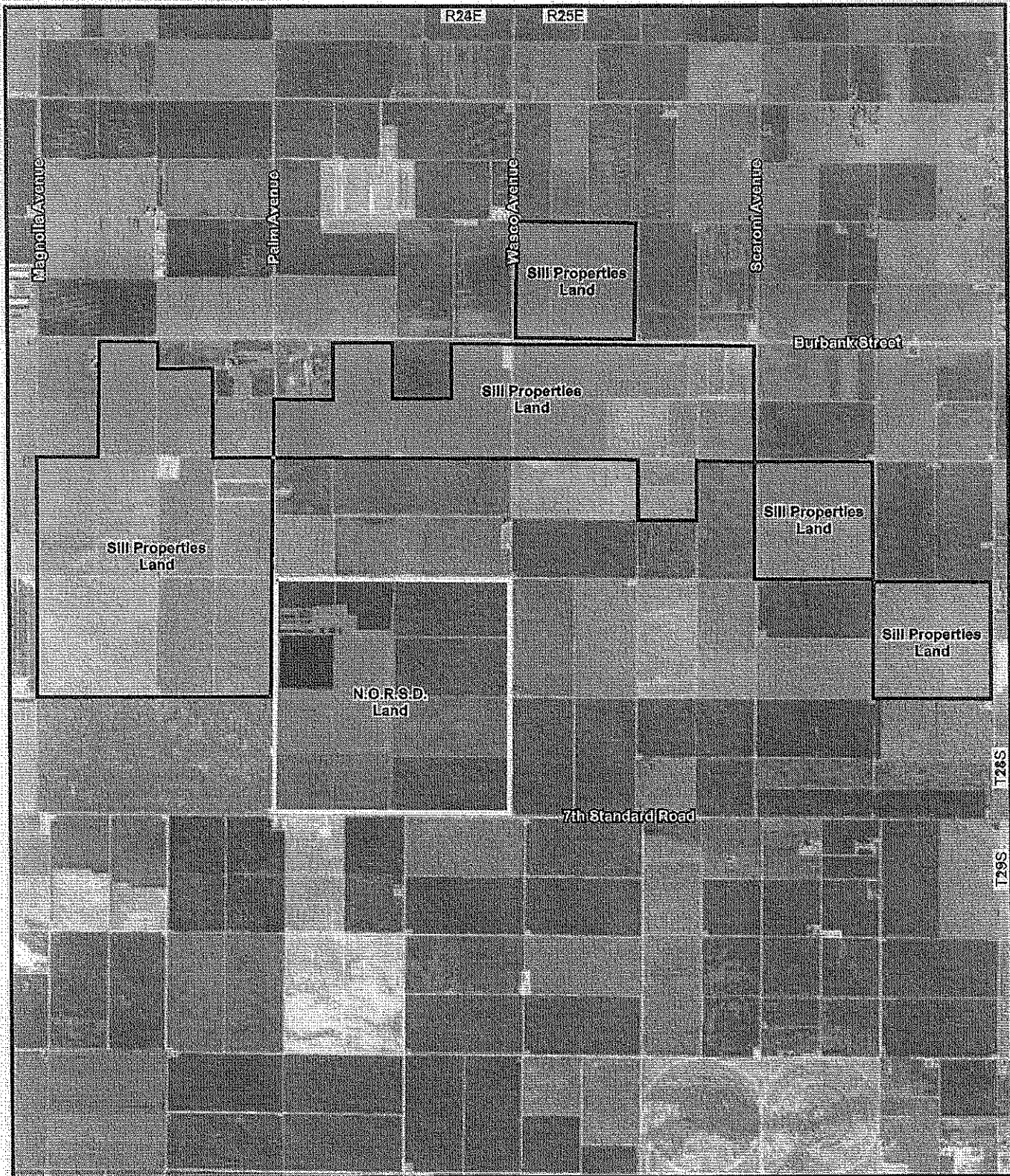
I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 3 February 2011.



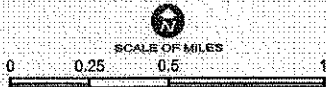
PAMELA C. CREEDON, Executive Officer

Order Attachments:
A Site Location Map

DMS/WDH: 12/2/2010



Map Source:
NAIP Aerial Photograph (2005)



REVISED SITE MAP
SPECIAL ORDER NO. R5-2011-0011
FOR
NORTH OF RIVER SANITARY DISTRICT NO. 1
AND
SILL PROPERTIES
WASTEWATER TREATMENT FACILITY AND
WATER RECLAMATION
KERN COUNTY

ATTACHMENT A

California Regional Water Quality Control Board
Central Valley Region

Katherine Hart, Chair



Arnold
Schwarzenegger
Governor

Dams
Agency for
Environmental
Protection

1685 E Street, Fresno, California 93706
(559) 445-5116 • Fax (559) 445-5910
<http://www.waterboards.ca.gov/centralvalley>

6 December 2010

Mr. John LaMar, District Manager
North of River Sanitary District No. 1
204 Universe Avenue
Bakersfield, CA 93308

Mr. Duffy Sill
Sill Properties
1508 18th Street, Suite 320
Bakersfield, CA 93301

RECEIVED

DEC 09 2010

BAKERSFIELD
ECONOMY-WATER

NOTICE
TENTATIVE SPECIAL ORDER TO MODIFY
WASTE DISCHARGE REQUIREMENTS
ORDER NO. R5-2009-0088
FOR
NORTH OF RIVER SANITARY DISTRICT NO. 1
AND
SILL PROPERTIES
WASTEWATER TREATMENT FACILITY
KERN COUNTY

Enclosed is tentative Special Order for North of River Sanitary District No. 1 Wastewater Treatment Facility and Sill Properties in Kern County. To conserve resources, this letter transmits a paper copy of the proposed Order to the Discharger only.

Beginning on **7 December 2010**, interested parties may download the proposed Order from the Regional Water Board's Internet website at:

http://www.waterboards.ca.gov/centralvalley/board_decisions/tentative_orders/.

Persons wishing to comment on this matter must submit their testimony, evidence, and/or comments in writing to the California Regional Water Quality Control Board – Central Valley Region no later than **5 p.m. on 7 January 2011**. Written materials received after 5 p.m. on 7 January 2011 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party.

If you have any questions regarding the tentative Order, or if you do not have Internet access and wish to request paper copies, please contact Denise Soria at (559) 444-2488 or via email at dsoria@waterboards.ca.gov.


W. DALE HARVEY
Senior Engineer
RCE No. 55628

Enclosures: Tentative Waste Discharge Requirements (Discharger only)
Standard Provisions (1 March 1991)

cc: (next page)

California Environmental Protection Agency

David Coupe, Office of Chief Counsel, State Water Resources Control Board,
Sacramento (via email)
California Department of Public Health, Office of Drinking Water, Fresno
California Department of Fish and Game, Region IV, Fresno
California Department of Water Resources, San Joaquin District, Fresno
Kern County Environmental Health Services Department, Bakersfield
Kern County Planning Department, Bakersfield
Kern County Water Agency, Bakersfield
✓ Mr. Nick Turner, AECOM, Bakersfield

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

SPECIAL ORDER NO. R5-2011-____
FOR
NORTH OF RIVER SANITARY DISTRICT NO. 1
AND
SILL PROPERTIES
WASTEWATER TREATMENT FACILITY
KERN COUNTY
MODIFYING WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2009-0088

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board), finds that:

1. On 13 August 2009, the Central Valley Water Board adopted Waste Discharge Requirements (WDRs) Order No. R5-2009-0088 for North of River Sanitary District No. 1 (District) to regulate its wastewater treatment facility (WWTF) located in the Northwest Quarter of Section 36, Township 28 South, and Range 24 East, MDB&M in Kern County.
2. WDRs Order No. R5-2009-0088 authorize a discharge of 7.5 million gallons per day (mgd) of undisinfectied secondary recycled water to four 32.5-acre unlined storage ponds (storage capacity of 1,488 acre-ft) and a Reclamation area of approximately 2,380 acres of farmland, of which 1,740 acres (Assessor's Parcel Nos. 088-210-01, 088-180-02, 088-180-34, 088-180-06, 088-180-07, 088-180-10, 088-180-12, 090-240-01, 090-240-20, 090-240-18, 090-240-21, 090-240-04, 090-140-08, 090-240-08, 090-240-07, 090-240-17, and 090-270-07) are owned and operated by Sill Properties. The other 640 acres (Assessor's Parcel Nos. 088-210-06, and 088-210-05) are owned by the District and operated by Sill Properties.
3. In a letter dated 27 April 2010, the District requested that the Central Valley Water Board revise WDRs Order No. R5-2009-0088 to reflect that Assessor's Parcel No. 090-240-07 (40 acres) be removed from the farmland receiving recycled water as it is no longer owned and operated by Sill Properties. Additionally the District would like to add two new parcels to the farmland receiving recycled water (Assessor's Parcel Nos. 090-240-03 (100 acres) and 090-240-05 (60 acres)). These new parcels are owned and operated by Sill Properties.
4. The new reclamation area reflecting the addition of the new parcels is of approximately 2500 acres, of which 1860 acres (Assessor's Parcel Nos. 088-210-01, 088-180-02, 088-180-34, 088-180-06, 088-180-07, 088-180-10, 088-180-12, 090-240-01, 090-240-20, 090-240-18, 090-240-21, 090-240-04, 090-140-08, 090-240-08, 090-240-17, 090-270-07, and 090-240-03, and 090-240-05) are owned and operated by Sill Properties. The other 640 acres (Assessor's Parcel Nos. 088-210-06, and 088-210-05) are owned by the District and operated by Sill Properties. A revised Attachment A Site Map is attached hereto and made part of this Order by reference.

ATTACHMENT A - SITE MAP

5. The District adopted an Initial Study and Negative Declaration on 18 October 1989, in accordance with the California Environmental Quality Act (CEQA), for the expansion of its WWTF to a capacity of 12 mgd. According to the Negative Declaration, treated wastewater will be used for reclamation on farmland owned by the District, Sill Properties, and possibly other local farmers. Additionally, the Negative Declaration documents the District's expressed interest in purchasing additional land for expansion of the reclamation area.
6. The Central Valley Water Board, as a responsible agency under CEQA regulations at section 15381 of Title 14 of the California Code of Regulations, has reviewed the Initial Study and Negative Declaration and included effluent limits, discharge specifications, groundwater limits, and other provisions and requirements in WDRs Order No. R5-2009-0088 that will be protective of water quality. There is nothing unique or different about the parcels being added to the 2340 acres that will receive recycled water or the 40 acres that are being removed from the reclamation area; thus, the addition and removal of these parcels under this Special Order will have an insignificant impact on water quality, particularly because the reclamation area will be slightly larger and the loading rates to the reclamation areas will be less.
7. The California Department of Public Health (DPH) requires recyclers of treated municipal wastewater to submit an engineering report detailing the use of recycled water, contingency plans, and safeguards, pursuant to section 60323 of Title 22 of the California Code of Regulations.
8. WDRs Order No. R5-2009-0088 includes Provision H.27 requiring the District to submit a Title 22 Engineering Report approved by DPH. A Title 22 Engineering Report dated February 2010 was prepared and submitted to DPH by AECOM on behalf of the District. By letter dated 27 September 2010, DPH notified the Central Valley Water Board that the Title 22 Engineering Report was incomplete. The District needs to update its Title 22 Engineering Report and must address the new parcels with the update.
9. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that pursuant to California Water Code Sections 13263 and 13377, WDRs Order No. R5-2009-0088 is amended as follows:

1. Finding No. 8 is revised to reflect the correct reclamation area and Assessor's Parcel Numbers as described in Finding No. 4 of this Order.
2. Wastewater shall not be applied to the newly incorporated parcels until the Discharger provides written documentation that the California Department of Public Health has approved the Title 22 Engineering Report for the reclamation area, including the new parcels.

RECEIVED
OCT 20 2010

3. A revised Attachment A Site Map is attached and made part of this Order by reference.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on _____.

PAMELA C. CREEDON, Executive Officer

Order Attachments:

A Site Location Map

DMS/WDH: 12/6/2010

WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION
ORDER



Linda S. Adams
Secretary for
Environmental
Protection

**California Regional Water Quality Control Board
Central Valley Region**

Karl E. Longley, ScD, PE, Chair

1685 E Street, Fresno, California 93706
(559) 445-5116 • Fax (559) 445-5910
<http://www.waterboards.ca.gov/centralvalley>



**Arnold
Schwarzenegger**
Governor

3 December 2009

RECEIVED

DEC 07 2009

BAKERSFIELD
AECOM-WATER

Mr. John LaMar, District Manager
North of River Sanitary District No. 1
204 Universe Avenue
Bakersfield, CA 93308

Mr. Duffy Sills
Sills Properties
1508 18th Street, Suite 320
Bakersfield, CA 93301

NOTICE
TENTATIVE SPECIAL ORDER
TO MODIFY
WASTE DISCHARGE REQUIREMENTS
ORDER NO. R5-2009-0088
FOR
NORTH OF RIVER SANITARY DISTRICT NO. 1
AND
SILLS PROPERTIES, INC.
WASTEWATER TREATMENT FACILITY
KERN COUNTY

Enclosed is a tentative Special Order for North of River Sanitary District No.1 Wastewater Treatment Facility and Sills Properties in Kern County. To conserve resources, this letter transmits a paper copy of the proposed Order to the Discharger only.

Beginning on **3 December 2009**, interested parties may download the proposed Order from the Regional Water Board's Internet website at:

http://www.waterboards.ca.gov/centralvalley/board_decisions/tentative_orders/. Persons wishing to comment on this matter must submit their testimony, evidence, and/or comments in writing to the California Regional Water Quality Control Board – Central Valley Region no later than **5 p.m. on 3 January 2010**. Written materials received after 5 p.m. on 3 January 2010 will not be accepted and will not be incorporated into the administrative record if doing so would prejudice any party.

If you have any questions regarding the proposed Order, or if you do not have Internet access and wish to request paper copies, please contact Denise Soria at 559.444.2488 or via email at dsoria@waterboards.ca.gov.



DOUGLAS K. PATTESON
Senior Engineer
RCE No. 55985

Enclosures: Tentative Special Order (Discharger only)

- cc: Ms. Lori Okun, Office of Chief Counsel, State Water Resources Control Board, Sacramento (via email)
Mr. Gordon Innes, State Water Resources Control Board, Sacramento
California Department of Public Health, Office of Drinking Water, Fresno
California Department of Fish and Game, Region IV, Fresno
California Department of Water Resources, San Joaquin District, Fresno
Kern County Environmental Health Services Department, Bakersfield
Kern County Planning Department, Bakersfield
Kern County Water Agency, Bakersfield
Mr. Nick Turner, AECOM, Bakersfield

NORTH OF RIVER SANITARY DISTRICT NO. 1

204 UNIVERSE AVENUE
BAKERSFIELD, CA 93308

DIRECTORS

RICHARD L KYKER: PRESIDENT
GARY McKIBBIN: VICE PRESIDENT
SAMUEL SCOLES
STEVE SHOFFNER
STEVE RUETTGBERS

SECRETARY-MANAGER

JOHN C. LaMAR
204 UNIVERSE AVENUE
PHONE (661) 399-6411
FAX (661) 399-2856
E-MAIL: jlamar@norsd.com

April 22, 2010

Denise Soria, Water Resource Control Engineer
California Regional Water Quality Control Board
Central Valley Region
Fresno Office
1685 "E" Street, Suite 100
Fresno, CA 93706-2007

Waste Discharge Requirements Order No.: R5-2009-0088 **Request For APN Revision**

The District requests a revision to the currently adopted Waste Discharge Requirements Order No. R5-2009-008 (WDR) dated August 13, 2009.

Page 2, Item 8 of the WDR states the expansion of the WWTF proposes a discharge of 7.5 MGD of undisinfected secondary treated wastewater to four 32.5 acre unlined storage ponds and to 2,380 acres of farmland. APN 090-240-07 is listed as one of the parcels which receive treated wastewater. APN 090-240-07 is not owned and operated by Sill Properties, Inc. and does not receive treated wastewater. It is requested APNs 090-240-03 and 090-240-05 be included as a substitute for APN 090-240-07.

Please feel free to contact me if there are any questions or if you need additional information to assist you in reviewing our request. Thank you for your attention to this matter and I look forward to your response.



LaRue Griffin
Assistant District Manager



**California Regional Water Quality Control Board
Central Valley Region**

Katherine Hart, Chair



**Arnold
Schwarzenegger**
Governor

Linda S. Adams
Secretary for
Environmental
Protection

1685 E Street, Fresno, California 93706
(559) 445-5116 • Fax (559) 445-5910
<http://www.waterboards.ca.gov/centralvalley>

24 February 2010

CERTIFIED MAIL
7008 1830 0003 4615 7988

Mr. John La Mar, District Manager
North of River Sanitary District No. 1
204 University Avenue
Bakersfield, CA 93308

Mr. Duffy Sills
Sills Properties
1508 18th Street, Suite 320
Bakersfield, CA 93301

TRANSMITTAL OF SPECIAL ORDER TO MODIFY WDR R5-2009-0088 FOR NORTH OF RIVER SANITARY DISTRICT NO. 1 AND SILLS PROPERTIES, INC. WASTEWATER TREATMENT FACILITY AND WATER RECLAMMATION, KERN COUNTY

Enclosed is an official copy of Special Order No. R5-2010-0015, as adopted by the California Regional Water Quality Control Board, Central Valley Region at its 29 January 2010 meeting.

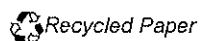
Within about 60 days, official copies of the above Orders will be posted on the Regional Board's website at http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/

If you have any questions, please contact Denise Soria at (559) 444-2488.

DOUGLAS K. PATTESON
Senior Engineer
RCE No. 55985

Enclosures: Order No. R5-2010-0015

California Environmental Protection Agency



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2010-0015
SPECIAL ORDER
TO MODIFY
WASTE DISCHARGE REQUIREMENTS
ORDER NO. R5-2009-0088
FOR
NORTH OF RIVER SANITARY DISTRICT NO. 1
AND
SILLS PROPERTIES, INC.
WASTEWATER TREATMENT FACILITY
KERN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board), finds that:

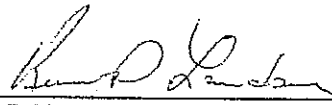
1. The North of River Sanitary District No.1 (District) owns and operates a wastewater treatment facility (WWTF) that serves the North of River Sanitary District Service Area, the City of Shafter, and certain portions of the County of Kern Service Area 71 (CSA-71). The WWTF consists of headworks, a lift station, a vortex grit removal system, addition of coagulant (Ferric Chloride) and Polymer, a primary clarifier, a plastic media trickling filter, a secondary clarifier, primary and secondary sludge digesters, and fourteen unlined sludge drying beds. Treated wastewater is discharged to four unlined storage ponds and to approximately 2,380 acres of farmland.
2. Waste Discharge Requirements (WDRs) Order No. R5-2009-0088, adopted by the Central Valley Water Board on 13 August 2009, prescribes requirements for a monthly average discharge flow of 7.5 million gallons per day (mgd) from the WWTF.
3. In its comments on the tentative WDRs, the District requested that the original compliance date in Provision H.26 be extended to June 2011. The request was to allow adequate time to install the groundwater monitoring network and collect sufficient data to evaluate nitrogen levels in groundwater. Central Valley Water Board staff concurred with extending the compliance date, but the change did not get reflected in the final Order.
4. The time schedule of Provision H.24 was based on a final compliance date of 15 August 2011, with several interim compliance dates. The compliance dates for Tasks e and f of Provision H.24 are not consistent with the compliance dates for the tasks that precede them and need to be adjusted. The final compliance date will not change.
5. The action to modify WDRs Order No. R5-2009-0088 is exempt from the provision of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) in accordance with Title 14 California Code of Regulations, Section 15301 (existing facility).

6. The Discharger and interested agencies and persons were notified of the Central Valley Water Board's intent to modify WDRs Order No. R5-2009-0088 and provided an opportunity for a public hearing and to submit written views and recommendations.
7. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED, pursuant to sections 13263 and 13267 of the California Water Code, that Waste Discharge Requirements Order No R5-2009-0088 is modified as follows:

1. Tasks e and f of Provision H.24: The deadline of **15 February 2010** is now **15 February 2011**.
2. Provision H.26: The deadline of **1 June 2010** is now **1 June 2011**.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 29 January 2010.

for 
PAMELA C. CREEDON, Executive Officer

DMS/DKP: 01/29/10



**California Regional Water Quality Control Board
Central Valley Region**



Linda S. Adams
*Secretary for
Environmental
Protection*

1685 E Street, Fresno, California 93706
(559) 445-5116 • Fax (559) 445-5910
<http://www.waterboards.ca.gov/centralvalley>

**Arnold
Schwarzenegger**
Governor

31 August 2009

CERTIFIED MAIL
7008 1830 0003 1201 4925

Mr. John La Mar, District Manager
North of River Sanitary District No. 1
204 University Avenue
Bakersfield, CA 93308

Mr. Duffy Sills
Sills Properties
1508 18th Street, Suite 320
Bakersfield, CA 93301

**TRANSMITTAL OF ADOPTED ORDERS FOR NORTH OF RIVER SANITARY DISTRICT
NO. 1 AND SILLS PROPERTIES, INC. WASTEWATER TREATMENT FACILITY AND
WATER RECLAMMATION, KERN COUNTY**

Enclosed is an official copy of Order No.R5-2009-0088, as adopted by the California Regional Water Quality Control Board, Central Valley Region at its 13 August 2009 meeting.

Within about 60 days, official copies of the above Orders will be posted on the Regional Board's website at http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/

If you have any questions, please contact Denise Soria at (559) 444-2488.

DOUGLAS K. PATTESON
Senior Engineer
RCE No. 55985

Enclosures: Order No. R5-2009-0088

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2009-0088
FOR
NORTH OF RIVER SANITARY DISTRICT NO. 1
AND
SILLS PROPERTIES, INC.
WASTEWATER TREATMENT FACILITY AND
WATER RECLAMATION
KERN COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Central Valley Water Board), finds that:

1. Waste Discharge Requirements (WDRs) Order No. 92-016, adopted by the Central Valley Water Board on 24 January 1992, for North of River Sanitary District No. 1 (District) was to regulate its previous wastewater treatment facility (WWTF) located west of Oildale, in Kern County. The District serves the North of River Sanitary District Service Area, the City of Shafter, and certain portions of the County of Kern Service Area 71 (CSA-71).
2. WDRs Order No. 92-016 authorized a discharge of 5.5 million gallons per day (mgd) of undisinfected secondary treated wastewater from the old WWTF to four 32.5-acre unlined storage ponds with a combined capacity of 1,488 acre-ft and to 780 acres of Reclamation Area owned and operated by the District. Water Reclamation Requirements (WRRs) Order No. 92-019 regulates 1,565 acres of Reclamation Area owned and operated by Sils Properties, Inc., a California Corporation. The Reclamation Area encompasses a total of 2,345 acres of farmland.
3. In August of 1999, the District completed construction of a new WWTF near its effluent reclamation land and storage ponds and abandoned its previous WWTF. The new WWTF is in the Northwest Quarter of Section 36, Township T28S, Range R24E, MDB&M, and three and a half miles west of the City of Shafter as shown on Attachment A, which is attached hereto and made part of this Order by reference.
4. In December 2008, the District submitted a Report of Waste Discharge (RWD) for a proposed expansion of its WWTF from 5.5 mgd to 7.5 mgd. The RWD proposed to construct an additional lined storage pond and mechanical dewatering facilities.
5. WDRs Order No. 92-016 needs to be updated to ensure that the discharge is consistent with Central Valley Water Board plans and policies and prescribe requirements that reflect changes the District has made to its WWTF and water recycling operation.

6. The District is the primary entity responsible for the maintenance and operation of the WWTF. Sills Properties, Inc. is the primary entity, and the District is the secondary entity, responsible for the application of recycled wastewater and compliance with the water recycling requirements of this Order. North of River Sanitary District No. 1 and Sills Properties, Inc. are hereafter jointly referred to as Discharger.

Existing Wastewater Treatment Facility

7. The existing WWTF consists of a headworks with two mechanical bar screens, a lift station, a vortex grit removal system, addition of coagulant (Ferric Chloride) and Polymer, a primary clarifier, a plastic media tricking filter, a secondary clarifier, primary and secondary sludge digesters operating in series, and fourteen unlined sludge drying beds. The effluent is then used to irrigate alfalfa, wheat, and corn that are used as fodder, fiber, and seed crop for nonhuman consumption. When irrigation demand is low, effluent is sent to Storage Ponds 1 and 3. A schematic plan of the WWTF is shown on Attachment B, which is attached hereto and made part of this Order by reference.
8. The expansion of the WWTF proposes a discharge of 7.5 mgd of undisinfected secondary treated wastewater to four 32.5-acre unlined storage ponds with a combined capacity of 1,488 acre-ft, and to 2,380 acres of farmland, of which 1,740 acres (Assessor's Parcel Nos. 088-210-01, 088-180-02, 088-180-34, 088-180-06, 088-180-07, 088-180-10, 088-180-12, 090-240-01, 090-240-20, 090-240-18, 090-240-21, 090-240-04, 090-140-08, 090-240-08, 090-240-07, 090-240-17, and 090-270-07) are own and operated by Sill Properties, Inc. The other 640 acres (Assessor's Parcel Nos. 088-210-06, and 088-210-05) are owned by the District and operated by Sill Properties, Inc.
9. The water and nitrogen balance in the RWD was based on an assumption that the existing ponds would be retrofitted with liners and indicates that a 21 acre lined storage pond with an approximate capacity of 270 acre-ft would need to be constructed to accommodate the flow increase to 7.5 mgd. If the WWTF were to utilize all of its current unlined storage pond capacity, the release of waste constituents to soil from the impounded effluent could potentially degrade groundwater.
10. The Discharger has fourteen unlined sludge drying beds and is proposing to construct mechanical dewatering facilities. The existing sludge drying beds will be used for dried sludge staging prior to land application. The Discharger applies sludge as a soil amendment to 80 acres of its land.

11. Self-Monitoring data from January 2006 to December 2008 contained in the Discharger's Self-Monitoring Reports (SMRs) characterize the discharge as follows:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Influent</u>	<u>Effluent</u>
Electrical Conductance (EC)	µmhos/cm	---	818
Five-day Biochemical Oxygen Demand (BOD ₅)	mg/L	208	34
Total Suspended Solids (TSS)	mg/L	315	18

Sanitary Sewer Overflows

12. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the treatment facility. Temporary storage and conveyance facilities (such as wet wells, regulated impoundments, tanks, highlines, etc.) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these temporary storage/conveyance facilities.
13. On 2 May 2006, the State Water Resources Control Board (hereafter State Water Board) adopted General Sanitary Sewer Order (State Water Board Water Quality Order No. 2006-0003-DWQ, "General Waste Discharge Requirements for Sanitary Sewer Systems"). The General Order requires all public agencies that own or operate sanitary sewer systems greater than one mile in length to comply with this order. The Discharger's collection system is greater than one mile in length; therefore, the Discharger applied for, and is covered by, the General Order.

Water Recycling

14. The Reclamation Area currently consists of approximately 2,380 acres of available farmland, of which 1,950 acres are utilized to grow crops: 1,080 acres are used to grow alfalfa, 490 acres to grow wheat, and 380 acres to grow corn. Wheat and corn are grown in a double crop fashion. These crops are used as fodder, fiber, and seed crop for nonhuman consumption.
15. Nitrogen uptake rates for alfalfa, wheat, and corn are 480, 175, and 250 lbs/acre/year, respectively, based on the *Western Fertilizer Handbook, 9th Edition*.
16. At the permitted flow of 7.5 mgd, and an average effluent nitrogen concentration of 27 mg/L, the total nitrogen loading to the 1,950 irrigated acres of the Reclamation Area is about 316 lbs/acre/year. The nitrogen loading will not exceed the crop nitrogen uptake rates, based on the current cropping distribution.

Site-Specific Conditions

17. The WWTF and Reclamation Area are in an arid climate characterized by dry summers and mild winters. The rainy season generally extends from November through March. Occasional rains occur during spring and fall months, but summer months are dry. Average annual precipitation and evaporation in the discharge area are about 4 inches and 65 inches, respectively, according to information published by the California Department of Water Resources (DWR).
18. Soils in the Reclamation Area are predominately Garces Silt Loam, followed by Panoche Clay Loam, according to the Web Soil Survey published by the United States Department of Agriculture Natural Resources Conservation Services. Garces Silt Loam and Panoche Clay Loam have been assigned a land capacity classification of 3s and 2s, respectively. These soils have severe to moderate limitations that restrict the choice of plants and require moderate conservation practices. These soils also have limitations within the root zone, such as shallowness of the root zone, a high content of stones, a low available water capacity, low fertility, or excessive salinity.
19. Land uses in the vicinity of the WWTF include: pasture, field crops, and vineyard, according to the Kern County 1998 Land Use Map published by the DWR. This is not a definitive inventory of crops that are or could be grown in the area. A detailed land use study to identify specific crops grown in the area is needed.
20. The WWTF is located outside the 100-year floodplain according to Federal Emergency Management Agency maps. However, the WWTF is located within Zone X, with a 1% annual chance of inundation with water depths of one foot or less.
21. The Discharger is not required to obtain coverage under a National Pollutant Discharge Elimination System general industrial storm water permit for the WWTF because all storm water runoff is retained onsite and does not discharge to a water of the United States.

Groundwater Considerations

22. The quality of groundwater in the area is unclear. A 1999 Water Supply Report developed by the Kern County Water Agency (KCWA) published in May 2003 was reviewed, but flow gradient and specific water quality information for the area around the WWTF could not be determined from the report. Regional maps in the report indicate that TDS is approximately 500 mg/L in the unconfined aquifer, which is equivalent to an EC of about 770 $\mu\text{hos/cm}$ ($\text{EC} = \text{TDS}/0.65$). As discussed below, site specific data indicates groundwater is of poorer quality; however, further studies are needed.

23. The groundwater-monitoring network at the WWTF consist of two groundwater monitoring wells (MW-1 and MW-2). The depths to groundwater in MW-1 and 2, as reported in the RWD, are approximately 200 and 250 feet below ground surface (bgs), respectively. Flow gradient of first encountered groundwater cannot be determined with two monitoring wells; a minimum of three wells are needed.
24. Average concentrations for constituents of concern based on monitoring well data from January 2006 to June 2008 are presented below:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>MW-1</u>	<u>MW-2</u>
EC	µmhos/cm	2,967	1,867
Total Dissolved Solids	mg/L	2,567	1,270
Chloride	mg/L	623	310
Sodium	mg/L	243	223
NO ₃ (as N)	mg/L	52	32

25. The Discharger's groundwater-monitoring network is inadequate. Both monitoring wells have multiple screen intervals, which does not provide an adequate representation of groundwater quality. Further, multiple screen intervals can provide inaccurate readings of groundwater depth. Background quality of first-encountered groundwater beneath the WWTF and Reclamation Area is unclear. The District needs to conduct a groundwater investigation to characterize the occurrence, gradient, and quality of first-encountered groundwater, and at what depth it occurs.
26. Source water samples are collected from water wells that supply the District's Service Area. Source water EC was reported at 252 µmhos/cm in 2006; 544 µmhos/cm in 2007; 381 µmhos/cm in 2008; and 432 µmhos/cm in 2009.

Basin Plan, Beneficial Uses, and Water Quality Objectives

27. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, revised January 2004* (hereafter Basin Plan) designates beneficial uses, establishes narrative and numerical water quality objectives, contains implementation plans and policies for protecting all waters of the Basin, and incorporates, by reference, plans and policies of the State Water Resources Control Board (State Water Board). Pursuant to Section 13263(a) of the California Water Code (CWC), these requirements implement the Basin Plan.
28. Water in the Tulare Lake Basin is in short supply, requiring importation of surface water from other parts of the State. The Basin Plan encourages recycling on irrigated crops wherever feasible and indicates that evaporation of recyclable wastewater is not an

acceptable permanent disposal method where the opportunity exists to replace an existing use or proposed use of fresh water with recycled water.

29. The WWTF is in Detailed Analysis Unit (DAU) No. 255 within the Kern Basin hydrologic unit. The Basin Plan identifies the beneficial uses of groundwater in this DAU as municipal and domestic supply, agricultural supply, industrial service supply, and wildlife habitat supply.
30. The Basin Plan includes a water quality objective for chemical constituents that, at a minimum, require waters designated as municipal and domestic supply to meet the maximum contaminant levels (MCLs) specified in Title 22 of the California Code of Regulations (CCR). The Basin Plan recognizes that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.
31. The Basin Plan establishes narrative water quality objectives for Chemical Constituents, Taste and Odors, and Toxicity. The Toxicity objective, in summary, requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial uses. Quantifying a narrative water quality objective requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses.
32. The Basin Plan identifies the greatest long-term problem facing the entire Tulare Lake Basin as the increase in salinity in groundwater, which has accelerated due to the intensive use of soil and water resources by irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until there is a long-term solution to the salt imbalance. Until then, the Basin Plan establishes several salt management requirements, including:
 - a. The incremental increase in salts from use and treatment must be controlled to the extent possible. The maximum EC of the discharge shall not exceed the EC of the source water plus 500 $\mu\text{mhos/cm}$. When the source water is from more than one source, the EC shall be a weighted average of all sources.
 - b. Discharges to areas that may recharge good quality groundwater shall not exceed an EC of 1,000 $\mu\text{mhos/cm}$, a chloride content of 175 mg/L, or boron content of 1.0 mg/L.

These effluent limits are considered best practicable treatment or control (BPTC).

33. The Basin Plan requires municipal WWTFs that discharge to land to comply with treatment performance standards for BOD₅ and TSS. WWTFs that preclude public

access and are greater than 1 mgd must provide removal of 80 percent or reduction to 40 mg/L, whichever is more restrictive, for both BOD₅ and TSS.

Antidegradation Analysis

34. State Water Resources Control Board Resolution No. 68-16 ("Policy with Respect to Maintaining High Quality Water of the State") (hereafter Resolution No. 68-16) prohibits degradation of groundwater unless it has been shown that:
 - a. The degradation is consistent with the maximum benefits to the people of the State;
 - b. The degradation will not unreasonable affect present and anticipated future beneficial uses;
 - c. The degradation does not result in water quality less than that prescribed in State and regional policies, including violation of one or more water quality objectives; and
 - d. The Discharger employs BPTC to minimize degradation.
35. Degradation of groundwater by some of the typical waste constituents released with discharge from a municipal wastewater utility after effective source control, treatment, and control is consistent with maximum benefit to the people of the State. The technology, energy, water recycling, and waste management advantages of municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impacts on water quality will be substantially less. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and therefore sufficient reason to accommodate growth and groundwater degradation provided terms of the Basin Plan are met.
36. Constituents of concern in the discharge that have the potential to degrade groundwater include salts and nutrients. This Order establishes terms and conditions of discharge to ensure that the discharge does not unreasonably affect present and anticipated uses of groundwater and includes groundwater limitations that apply water quality objectives established in the Basin Plan to protect beneficial uses. The discharge will likely not impair the beneficial uses of groundwater because:
 - a. For nitrogen, shallow groundwater already contains nitrate concentrations in excess of water quality objective as a result of previous discharges and agricultural practices in the area. This Order includes a time schedule to meet an effluent nitrogen limit of 10 mg/L and/or demonstrate management practices to preclude any further degradation for nitrate.

- b. For Salinity, the Basin Plan contains effluent limits for EC of source water plus 500 $\mu\text{mhos/cm}$ and 1,000 $\mu\text{mhos/cm}$ maximum for discharges to areas that may recharge to good quality groundwater. These limits considered the antidegradation policy when adopted. Effluent from the WWTF is approximately 820 $\mu\text{mhos/cm}$. This meets the Basin Plan limits and is less than the lowest secondary MCL. Based on the existing monitoring network, shallow groundwater is of marginal quality with EC concentrations that appears to be greater than 1,000 $\mu\text{mhos/cm}$. If this represents background, degradation will not occur. If further groundwater studies indicate natural background quality for salinity is less than the quality of the effluent (820 $\mu\text{mhos/cm}$), this Order will be reopened to consider degradation.

Treatment and Control Practices

37. The WWTF described in Finding Nos. 7 through 11, will provide treatment and control of the discharge that incorporates:
 - a. secondary treatment;
 - b. pretreatment monitoring and compliance assessment;
 - c. recycling of wastewater for crop irrigation;
 - d. appropriate biosolids handling and treatment for reuse;
 - e. an operation and maintenance (O&M) manual;
 - f. certified operators to ensure proper operation and maintenance; and
 - g. discharge and groundwater monitoring.

Water Recycling Criteria

38. Domestic wastewater contains pathogens harmful to humans that are typically measured by means of total or fecal coliform, as indicator organisms. The California Department of Public Health (DPH), which has primary statewide responsibility for protecting public health, has established statewide criteria in Title 22, CCR, Section 60301 et seq., (hereafter Title 22) for the use of recycled water and has developed guidelines for specific uses. Revisions of the water recycling criteria in Title 22 became effective on 2 December 2000. The revised Title 22 expands the range of allowable uses of recycled water, establishes criteria for these uses, and clarifies some of the ambiguity contained in the previous regulations.

39. A 1988 Memorandum of Agreement (MOA) between DPH and State Water Resources Control Board (State Water Board) on the use of recycled water establishes basic principles relative to the agencies and the regional water boards. In addition, the MOA allocates primary areas of responsibility and authority between these agencies, and provides for methods and mechanisms necessary to assure ongoing, continuous future coordination of activities relative to the use of recycled water in California.
40. State Water Board Resolution No. 77-1, "Policy with Respect to Water Recycling in California," encourages recycling projects that replace or supplement the use of fresh water, and the Water Recycling Law (CWC Sections 13500-13529.4) declares that utilization of recycled water is of primary interest to the people of the State in meeting future water needs.
41. The Basin Plan encourages recycling on irrigated crops wherever feasible and indicates that evaporation of recyclable wastewater is not an acceptable permanent disposal method where the opportunity exists to replace an existing use or proposed use of fresh water with recycled water.
42. Title 22, Section 60323 requires recyclers of treated municipal wastewater to submit an engineering report detailing the use of recycled water, contingency plans, and safeguards. Central Valley Water Board files do not contain a Title 22 Engineering Report for the Discharger's water reclamation operation. A provision requiring the Discharger to submit a Title 22 engineering report is included in this Order.

Other Regulatory Considerations

43. The United States Environmental Protection Agency (EPA) has promulgated biosolids reuse regulations in Title 40, Code of Federal Regulations (CFR), Part 503, Standards for the Use or Disposal of Sewage Sludge, which establishes management criteria for protection of ground and surface waters, sets application rates for heavy metals, and establishes stabilization and disinfection criteria. The Discharger may have separate and/or additional compliance, reporting, and permitting responsibilities to EPA.
44. As the discharge consists of treated domestic sewage and incidental discharges from treatment and storage facilities associated with a domestic wastewater treatment plant, and as these discharges are regulated by waste discharge requirements, and these discharges are consistent with applicable water quality objectives, the WWTF and its discharge is exempt from containment pursuant to Title 27, section 20090(a).

CEQA

45. North of River Sanitary District No. 1 adopted a Negative Declaration on 18 October 1989, in accordance with the California Environmental Quality Act (CEQA), for the expansion of a regional WWTF to an ultimate capacity of 12 mgd.
46. Central Valley Water Board staff reviewed the Negative Declaration and found it did not fully address potential impacts on groundwater from the project. The Central Valley Water Board, as a responsible agency under CEQA, has included in this Order effluent limits for salinity, BOD₅, TSS, and nitrogen, and groundwater limits for nitrate, EC, and other constituents with MCLs, taste and odor producing, and toxicity constituents. Compliance with these limits will mitigate any significant impacts to water quality.

General Findings

47. Pursuant to CWC Section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.
48. The Central Valley Water Board will review this Order periodically and will revise requirements when necessary.
49. CWC Section 13267(b) states that: "In conducting an investigation specified in subdivision (a), the [Central Valley Water Board] may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the [Central Valley Water Board] requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the [Central Valley Water Board] shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports."
50. The technical reports required by this Order and the attached Monitoring and Reporting Program (MRP) No. R5-2009-0088 are necessary to assure compliance with these waste discharge requirements. The Discharger operates the WWTF that discharges the waste subject to this Order.
51. The DWR set standards for the construction and destruction of groundwater wells, as described in California Well Standards Bulletin 74-90 (June 1991) and Water Well Standards: State of California Bulletin 94-81 (December 1981). These standards, and

any more stringent standards adopted by the State or county pursuant to CWC Section 13801, apply to all monitoring wells.

Public Notice

52. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.
53. The Discharger and interested agencies and persons have been notified of the intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
54. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that Waste Discharge Requirements Order No. 92-016 and Water Reclamation Requirements Order No. 92-019 are rescinded and that, pursuant to Sections 13263 and 13267 of the California Water Code, North of River Sanitary District No. 1 and Sils Properties, Inc. and their agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the CWC and regulations adopted thereunder, shall comply with the following:

A. Prohibitions

1. Discharge of waste to surface waters or surface water drainage courses is prohibited.
2. Bypass or overflow of untreated wastes, except as allowed by *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*, dated 1 March 1991, E.2 is prohibited.
3. Discharge of waste classified as 'hazardous', as defined in Section 2521(a) of Title 23, CCR, Section 2510 et seq., is prohibited. Discharge of waste classified as 'designated', as defined in CWC Section 13173, in a manner that causes violation of groundwater limitations, is prohibited.

B. Effluent Limitations

1. The effluent discharge shall not exceed the following limitations:

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD ₅ ¹	mg/L	40	80
TSS ²	mg/L	40	80
Chloride	mg/L	175	---

¹ Five-day biochemical oxygen demand

² Total suspended solids

2. The arithmetic mean of BOD₅ and TSS in effluent samples collected over a monthly period shall not exceed 20 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (80 percent removal).
3. The 12-month rolling average EC of the discharge shall not exceed the 12-month rolling average EC of the source water plus 500 μ mhos/cm. Compliance with this effluent limitation shall be determined monthly.
4. After the expansion of the WWTF is complete, the Total Nitrogen of the discharge shall not exceed the monthly average of 10 mg/L unless Provision H.26 is satisfied.

C. Discharge Specifications

1. The monthly average discharge flow shall not exceed 7.5 mgd.
2. All conveyance, treatment, storage, and disposal units shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100 year return frequency.
3. Public contact with effluent (treatment works, Ponds, Reclamation Area) shall be precluded through such means as fences, signs (in accordance with Title 22, CCR Section 60310(g)), or acceptable alternatives.
4. Objectionable odors shall not be perceivable beyond the limits of the WWTF property at an intensity that creates or threatens to create nuisance conditions.
5. Effluent storage ponds shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration during the winter. Design seasonal precipitation shall be based on total annual

precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

6. On or about **1 October** of each year, available disposal pond storage capacity shall at least equal the volume necessary to comply with Discharge Specification C.5.
7. Ponds shall be managed to prevent breeding of mosquitoes. In particular,
 - a. An erosion control plan should assure that coves and irregularities are not created around the perimeter of the water surface.
 - b. Weeds shall be minimized through control of water depth, harvesting, and herbicides.
 - c. Dead algae, vegetation and other debris shall not accumulate on the water surface.
 - d. Vegetation management operations in areas in which nesting birds have been observed shall be carried out either before or after, but not during, the 1 April to 30 June bird nesting season.
8. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of groundwater limitations.

D. Recycling Specifications

The following Specifications apply to the Reclamation Area under the ownership or control of the Discharger.

1. Use of undisinfected secondary treated recycled water shall be limited to flood irrigation of fodder, fiber, and seed crops not eaten by humans or for grazing of non-milking cattle and shall comply with the provisions of Title 22.
2. The Discharger will maintain the following setback distances from areas irrigated with recycled water:

<u>Setback Distance (feet)</u>	<u>To</u>
25	Property Line
30	Public Roads
50	Drainage Courses
100	Irrigation Wells
150	Domestic Wells

3. No physical connection shall exist between recycled water piping and any domestic water supply or domestic well, or between recycled water piping and any irrigation well that does not have an air gap or reduce pressure principle device.
4. The perimeter of the Reclamation Area shall be graded to prevent ponding along public roads or other public areas and prevent runoff onto adjacent properties not owned or controlled by the Discharger.
5. Areas irrigated with recycled water shall be managed to prevent nuisance conditions or breeding of mosquitoes. More specifically:
 - a. All applied irrigation water must infiltrate completely within a 48-hour period;
 - b. Ditches not serving as wildlife habitat should be maintained free of emergent, marginal, and floating vegetation; and
 - c. Low-pressure and unpressurized pipelines and ditches accessible to mosquitoes shall not be used to store recycled water.
6. Recycling of WWTF effluent shall be at reasonable agronomic rates considering the crop, soil, climate, and irrigation management plan. The annual nutrient loading to the Reclamation Area, including the nutritive value of organic and chemical fertilizers and recycled water, shall not exceed crop demand.
7. Public contact with recycled water shall be controlled using signs and/or other appropriate means. Signs of a size no less than four inches high by eight inches wide with proper wording (shown below) shall be placed at all areas of public access and around the perimeter of all areas used for effluent disposal or conveyance to alert the public of the use of recycled water. All signs shall display an international symbol similar to that shown in Attachment C, as part of this Order, and present the following wording:

“RECYCLED WATER – DO NOT DRINK”

“AGUA DE DESPERDICIO RECLAMADA – POR FAVOR NO TOME”

E. Sludge Specifications

Sludge in this document means the solid, semisolid, and liquid residues removed during primary, secondary, or advance wastewater treatment processes. Solid waste refers to grit and screening material generated during preliminary treatment. Residual sludge means sludge that will not be subject to further treatment at the WWTF. Biosolids refers to sludge that has undergone sufficient treatment and testing to quality for reuse pursuant

to federal and state regulations as a soil amendment for agriculture, silviculture, horticulture, and land reclamation.

1. Sludge and solid waste shall be removed from screens, sumps, aeration basins, ponds, clarifiers, etc. as needed to ensure optimal plant operation.
2. Treatment and storage of sludge generated by the WWTF shall be confined to the WWTF property.
3. Any handling and storage of residual sludge, solid waste, and biosolids on property of the WWTF shall be temporary (i.e., no longer than two years) and controlled and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitation of this Order.
4. Residual sludge, biosolids, and solid waste shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27. Removal for further treatment, disposal, or reuse at sites (i.e., landfill, composting sites, soil amendment sites) operated in accordance with valid waste discharge requirements will satisfy this Specification.
5. Use of biosolids as a soil amendment shall comply with valid waste discharge requirements issued by a Regional Water Board or the State Water Board or a local (e.g., county) program authorized by a Regional Water Board. In most cases, this means the General Biosolids Order (State Water Board Water Quality Order No. 2004-12-DWQ, "General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities"). For a biosolids use project to be authorized by the General Biosolids Order, the Discharger must file a complete Notice of Applicability for each project.
6. Any proposed change in sludge use or disposal practice shall be reported in writing to the Executive Officer at least 90 days in advance of the change.

F. Pretreatment Requirements

1. The Discharger shall implement the necessary legal authorities, programs and controls to ensure that the following incompatible waste are not introduced to the treatment system, where incompatible wastes are:
 - a. Wastes that create a fire or explosion hazard in the treatment works;

- b. Wastes that will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is specially designed to accommodate such wastes;
 - c. Solid or viscous wastes in amounts that cause obstruction to flow in sewers, or which cause other interference with proper operations or treatment works;
 - d. Any waste, including oxygen demanding pollutants (BOD₅, etc.), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and loss of treatment efficiency;
 - e. Heat in amounts that inhibit or disrupt biological activity in the treatment works, or that raise influent temperatures above 40°C (104°F), unless the treatment works is designed to accommodate such heat;
 - f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;
 - g. Pollutants that result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; and
 - h. Any trucked or hauled pollutants, except at points predesignated by the Discharger.
2. The Discharger shall implement the controls necessary to ensure that the following incompatible wastes are not introduced to the treatment system, where incompatible wastes are:
- a. Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or
 - b. Inhibit or disrupt treatment processes, treatment system operations, or sludge processes, use, or disposal and either cause a violation of this Order or prevent sludge use or disposal in accordance with this Order.

G. Groundwater Limitations

1. Release of waste constituents from any treatment or storage component associated with the discharge shall not cause or contribute to groundwater:
 - a. Containing constituent concentrations in excess of the concentrations specified below or natural background quality whichever is greater:

- (i) Nitrate as nitrogen of 10 mg/L.
 - (ii) Total Coliform Organisms of 2.2 Most Probable Number /100 mL.
 - (iii) For constituents identified in Title 22, the MCLs quantified therein.
- b. Containing taste or odor-producing constituents, toxic substances, or any other constituents in concentrations that cause nuisance or adversely affect beneficial uses.

H. Provisions

1. The Discharger shall comply with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*, dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as Standard Provision(s).
2. The Discharger shall comply with MRP No. R5- 2009-0088, which is part of this Order, and any revisions thereto as adopted by the Central Valley Water Board or approved by the Executive Officer. The submittal date shall be no later than the submittal date specified in the MRP of the Discharger self-monitoring reports.
3. The Discharger shall keep at the WWTF a copy of this Order, including its MRP, Information Sheet, attachments, and Standard Provisions, for reference by operating personnel. Key operating personnel shall be familiar with its contents.
4. The Discharger shall not allow pollutant-free wastewater to be discharged into the Facility collection, treatment, and disposal systems in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means storm water (i.e., inflow), groundwater (i.e., infiltration), cooling waters, and condensates that are essentially free of pollutants.
5. The Discharger must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also include adequate laboratory controls and appropriate quality assurance procedures. This Provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Discharger only when the operation is necessary to achieve compliance with the conditions of this Order.
6. All technical reports and work plans required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper

application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code Sections 6735, 7835, and 7835.1. To demonstrate compliance with sections 415 and 3065 of Title 16, CCR, all technical reports must contain a statement of the qualifications and responsible registered professional(s). As required by these laws, completed technical reports and work plans must bear the signature(s) and seal(s) of the registered professionals(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

7. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Accordingly, the Discharger shall submit to the Central Valley Water Board on or before each report due date the specified document or, if an action is specified, a written report detailing evidence of compliance with the date and task. If noncompliance is being reported, the reasons for such noncompliance shall be stated, plus an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board by letter when it returns to compliance with the time schedule. Violations may result in enforcement action, including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.
8. In the event of any change in control or ownership of land or waste treatment and storage facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.
9. To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the address and telephone number of the persons responsible for contact with the Central Valley Water Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. If approved by the Executive Officer, the transfer request will be submitted to the Central Valley Water Board for its consideration of transferring the ownership of this Order at one of its regularly scheduled meetings.
10. As a means of discerning compliance with Discharge Specification C.4, the dissolved oxygen (DO) content in the upper one foot of any wastewater pond shall not be less than 1.0 mg/L for three consecutive days. Should the DO be below 1.0 mg/L during a weekly sampling event, the Discharger shall take all reasonable steps to correct the problem and commence daily DO monitoring in the affected ponds until the problem

has been resolved. If unpleasant odors originating from affected ponds are noticed in developed areas, or if the Discharger received one or more odor complaints, the Discharger shall report the findings in writing within 5 days of the date and shall include a specific plan to resolve the low DO results to the Central Valley Water Board within 10 days of that date.

11. The pH of the discharge shall not be less than 6.5 or greater than 8.3 pH units for more than three consecutive sampling events. In the event that the pH of the discharge is outside of this range for more than three consecutive sampling events, the Discharger shall submit a technical evaluation in its monthly SMRs documenting the pH of the discharge to the reclamation area, and if necessary demonstrate that the effect of the discharge on soil pH will not exceed the buffering capacity of the soil profile.
12. The District shall maintain and operate all ponds sufficient to protect the integrity of containment levees and prevent overtopping or overflows. Unless a California civil engineer certifies (based on design, construction, and condition of operation and maintenance) that less freeboard is adequate, the operating freeboard in any pond shall never be less than two feet (measured vertically). As a means of management and to discern compliance with this Provision, the Discharger shall install and maintain in each pond permanent markers with calibration that indicates the water level at design capacity and enables determination of available operational freeboard.
13. The Discharger shall submit the technical reports and work plans required by this Order for Central Valley Water Board staff consideration and incorporate comments they may have in a timely manner, as appropriate. The Discharger shall proceed with all work required by the following Provisions by the due dates specified.
14. The Discharger shall comply with Statewide General Waste Discharge Requirements For Sanitary Sewer Systems, Water Quality Order No. 2006-0003-DWQ.
15. **By 1 January 2010**, and periodically thereafter (but not less than once every **five years**) the Discharger shall document its efforts to promote new or expanded wastewater recycling and reclamation opportunities.
16. **By 1 January 2010**, the District shall submit a Work Plan evaluating the existing groundwater network and its effectiveness to investigate the areas affected and potentially affected by the WWTF and its discharge(s) to land. Based on the evaluation, the Work Plan shall propose a time schedule for additional groundwater monitoring wells, as appropriate.

The Work Plan shall satisfy the information needs specified in the monitoring well installation section of Attachment D, *Standard Monitoring Well Provisions for Waste Discharge Requirements*.

- ✓ 17. **By 1 June 2010**, complete well installation and commence groundwater monitoring in accordance with the Work Plan submitted pursuant to Provision H.16 and Monitoring and Reporting Program No. R5-2009-0088.
18. **By 1 July 2010**, submit a monitoring well installation report that meets the requirements of Attachment D.
19. **By 1 January 2010**, the Discharger shall submit a technical report describing a sludge management plan that satisfies the information requirements of Attachment E, *Sludge Management Plan*. *Accepted by RWCQS Sept 8 2011*
- ✓ 20. **By 1 January 2010**, the District shall submit a Work Plan and time schedule for installation of its proposed mechanical dewatering facilities and elimination of the use of unlined sludge drying beds. *submitted*
21. **By 1 June 2010**, the Discharger shall submit a technical report describing the results of a detailed land use study that identifies: crops grown around the WWTF, regional cropping patterns, detailed soil classifications, and appropriate concentrations of salinity constituents in irrigation water that will be protective of all crops grown in the vicinity.
22. The District shall comply with all pretreatment requirements contained in 40 CFR 403 and shall be subject to enforcement actions, penalties, fines, and other remedies by the U.S. EPA or other appropriate parties, as provided in the Clean Water Act, as amended. The Discharger shall implement and enforce its Publicly-Owned Treatment Works (POTW) Pretreatment Program once approved, which is hereby made an enforceable condition of these requirements. The U.S. EPA may initiate enforcement action against an industrial user for noncompliance with applicable standards and requirements as provided in the Clean Water Act.
23. The District shall enforce the requirements promulgated under Sections 307(b),(c),(d), and 402(b) of the Clean Water Act. The District shall cause industrial users subject to federal categorical standards to achieve compliance no later than the date specified in those requirements or, in the case of a new industrial user, upon commencement of the discharge.

24. **By 15 August 2011**, the District shall submit a proposed pretreatment program that includes the following. The District shall also submit semiannual progress report until the following tasks are completed.

<u>Tasks</u>	<u>Compliance Date</u>
a. Results of an industrial user survey.	15 August 2010
b. An evaluation of the legal authority necessary for the administration and enforcement of the requirements of Sections 307(b) and (c) and 402(b)(8) of the Clean Water Act.	15 August 2010
c. Technical information necessary to develop and implement the pretreatment ordinance or other means of enforcing pretreatment standards.	15 August 2010
d. An evaluation of the financial programs and revenue sources to implement the program, including proposed funding and staffing levels.	15 August 2010
e. A monitoring program which will implement the requirements of the pretreatment program.	15 February 2010
f. A list of monitoring equipment required to implement the pretreatment program and a description of municipal facilities necessary for monitoring and analysis of industrial wastes.	15 February 2010
g. Specific effluent limitations for prohibited pollutants (as defined by 40 CFR 403.5) which shall be incorporated into the pretreatment program.	15 August 2011
h. Complete pretreatment program package (40 CFR 403.9) with request for pretreatment program approval.	15 August 2011

25. After the Central Valley Water Board has approved the pretreatment program developed as a result of completing the tasks listed in Provision H.24 and the EPA has approved the program, the District shall perform the pretreatment functions required in 40 CFR 403, including, but not limited to:

- a. Implementing the necessary legal authorities as provided in 40 CFR 403.8(f)(1);
- b. Enforcing the pretreatment requirements under 40 CFR 403.5 and 403.6;
- c. Implementing the programmatic functions as provided in 40 CFR 403.8(f)(2);
- d. Providing the requisite funding and personnel to implement the pretreatment program as provided in 40 CFR 403(f)(3); and
- e. Publishing a list of significant violators as required by 40 CFR 403.8(f)(2)(vii).

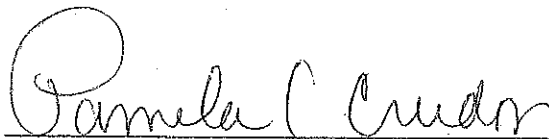
26. **By 1 June 2010**, the Discharger shall comply with the Effluent Nitrogen Limitation (Effluent Limitation B.4), or alternatively, the Discharger shall submit a design report and performance demonstration for the effluent storage ponds. If this alternative is pursued, the performance demonstration shall establish that the pond design, in combination with the contents of a Nutrient Management Plan of Attachment F, will be protective of groundwater quality and that seepage from the ponds will not contribute to nitrogen in groundwater exceeding groundwater limitations. This Provision will be considered satisfied, following written acceptance from the Executive Officer. The Nutrient Management Plan shall include at a minimum:

- a. Identification of land application area;
- b. A description of the types of crops to be grown and their water and nutrient uptake rates;
- c. Supporting data and calculations for monthly and annual water and nutrient balances;
- d. Management practices that will ensure wastewater, manure, irrigation water, and commercial fertilizers are applied at agronomic rates;
- e. A system of record keeping.

The Discharger shall submit reports **quarterly** that describe the status of the performance demonstration.

27. **By 1 January 2010**, the Discharger shall submit an updated Title 22 Engineering Report pursuant to Title 22 of the California Code of Regulations. A copy of this report shall be provided to DPH. This Provision shall be considered satisfied upon submittal by the Discharger of a letter from DPH determining the report is complete.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 13 August 2009.



PAMELA C. CREEDON, Executive Officer

Order Attachments:

- A Site Location Map
 - B Flow Schematic
 - C Recycled Water Signage
 - D Monitoring Well Installation Work Plan Requirements
 - E Sludge Management Plan Requirements
 - F Nutrient Management Plan Requirements
- Monitoring and Reporting Program No. R5-2009-0088
Information Sheet
Standard Provisions (1 March 2009)

DMS/DKP: 6/09/2009

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2009-0088
FOR
NORTH OF RIVER SANITARY DISTRICT NO.1
AND
SILLS PROPERTIES, INC.
WASTEWATER TREATMENT FACILITY AND
WATER RECLAMATION
KERN COUNTY

This monitoring and Reporting Program (MRP) is required pursuant to California Water Code (CWC) Section 13267.

The Discharger shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts or the Executive Officer issues a revised MRP. Changes to sample locations shall be established with concurrence of Central Valley Water Board staff, and a description of the revised stations shall be submitted for approval by the Executive Officer.

All samples should be representative of the volume and nature of the discharge or matrix of material sampled. All analyses shall be performed in accordance with **Standard Provisions and Reporting Requirements for Waste Discharge Requirements**, dated 1 March 1991 (Standard Provisions).

Field test instruments (such as pH) may be used provided that the operator is trained in the proper use of the instrument and each instrument is serviced and/or calibrated at the recommended frequency by the manufacturer or in accordance with manufacturer instructions.

Analytical procedures shall comply with the methods and holding times specified in the following: *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA); *Test Methods for Evaluating Solid Waste* (EPA); *Methods for Chemical Analysis of Water and Wastes* (EPA); *Methods for Determination of Inorganic Substances in Environmental Samples* (EPA); *Standard Methods for the Examination of Water and Wastewater* (APHA/AWWA/WEF); and *Soil, Plant and Water Reference Methods for the Western Region* (WREP 125). Approved editions shall be those that are approved for use by the United States Environmental Protection Agency or the California Department of Public Health's Environmental Laboratory Accreditation Program). The Discharger may propose alternative methods for approval by the Executive Officer.

If monitoring consistently shows no significant variation in magnitude of a constituent concentration or parameter after at least 12 months of monitoring, the Discharger may request the MRP be revised to reduce monitoring frequency. The proposal must include adequate technical justification for reduction in monitoring frequency.

A glossary of terms used within this MRP is included on page 10 and a list of the constituents required for the monitoring of Priority Pollutants is included in Table 1, which is on page 11.

INFLUENT MONITORING

Influent samples shall be collected at the inlet of the headworks of the WWTF. Time of collection of the sample shall be recorded. Influent monitoring shall include at least the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Continuous	Flow	mgd	Meter
Weekly	pH	pH Units	Grab
Weekly	EC	µmhos/cm	Grab
Weekly	BOD ₅	mg/L	24-hour composite
Weekly	TSS	mg/L	24-hour composite
Monthly	Monthly Average Discharge	mgd	Computed

EFFLUENT MONITORING

Effluent samples shall be collected at a point in the system following treatment and before discharge to the effluent storage ponds or reclamation area. Time of collection of the sample shall be recorded. Effluent monitoring shall include the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Weekly	pH	pH Units	Grab
Weekly	EC	µmhos/cm	Grab
Weekly	BOD ₅	mg/L	24-hour composite
Weekly	TSS	mg/L	24-hour composite
Monthly	Nitrate as N	mg/L	24-hour composite
Monthly	TKN	mg/L	24-hour composite
Monthly	Ammonia	mg/L	24-hour composite
Monthly	Total Nitrogen	mg/L	Computed
Monthly	Total Dissolved Solids	mg/L	24-hour composite
Monthly	Sodium	mg/L	24-hour composite
Monthly	Chloride	mg/L	24-hour composite
Annually	General Minerals	mg/L	24-hour composite
Annually	Priority Pollutants (see Table 1)	Varies ¹	Varies

¹ mg/L or µg/L, as appropriate.

POND MONITORING

Permanent markers (e.g., staff gages) shall be placed in all ponds. The markers shall have calibrations indicating water level at the design capacity and available operational freeboard. Effluent storage and disposal pond monitoring shall include at least the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Weekly	DO	mg/L	Grab
Weekly	pH	pH Units	Grab
Weekly	Freeboard	Feet ¹	Grab

¹ To nearest tenth of a foot

The Discharger shall inspect the condition of the disposal and/or effluent storage ponds weekly and record visual observations in a bound logbook. Notations shall include observations of whether weeds are developing in the water or along the bank, and their location; whether grease, dead algae, vegetation, scum, or debris are accumulating on the pond surface and their location; whether burrowing animals or insects are present; and the color of the reservoirs (e.g., dark sparkling green, dull green, yellow, gray, tan, brown, etc.). A summary of the entries made in the log shall be included in the subsequent monitoring report.

GROUNDWATER MONITORING

After measuring water levels and prior to collecting samples, each monitoring well shall be adequately purged to remove water that has been standing within the well screen and casing that may not be chemically representative of formation water. Depending on the hydraulic conductivity of the geologic setting, the volume removed during purging is typically from 3 to 5 volumes of standing water within the well casing and screen, or additionally the filter pack pore volume.

The Discharger shall monitor all wells in its Groundwater Monitoring Network, and any additional wells installed pursuant to this MRP, for the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Quarterly	Depth to groundwater	Feet ¹	Measured
Quarterly	Groundwater Elevation	Feet ²	Computed
Quarterly	pH	pH Units	Grab
Quarterly	EC	µmhos/cm	Grab
Quarterly	Nitrate as N	mg/L	Grab
Quarterly	Total Nitrogen	mg/L	Grab
Quarterly	Total Organic Carbon	mg/L	Grab
Quarterly	Total Dissolved Solids	mg/L	Grab
Quarterly	Chloride	mg/L	Grab

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Quarterly	Sodium	mg/L	Grab
Quarterly	Arsenic	µg/L	Grab
Quarterly	Iron	µg/L	Grab
Quarterly	Manganese	µg/L	Grab
Annually	General Minerals	mg/L	Grab

¹ To nearest tenth of a foot

² To nearest tenth of a foot above Mean Sea Level

SOURCE WATER MONITORING

For each source (either well or surface water supply), the Discharger shall calculate the flow-weighted average concentrations for the specified constituents utilizing monthly flow data and the most recent chemical analysis conducted in accordance with Title 22 drinking water requirements. Alternatively, the Discharger may establish representative sampling stations within the distribution system serving the same area as is served by the WWTF.

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Annually	EC	µmhos/cm	Computed average
Annually	General Minerals	mg/L	Computed average

SLUDGE MONITORING

Sludge shall be sampled for the following constituents:

Arsenic	Copper	Nickel
Cadmium	Lead	Selenium
Molybdenum	Mercury	Zinc

Monitoring shall be conducted: using the methods is "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), as required in Title 40 of the Code of Federal Regulations (40 CFR), Part 503.8(b)(4). The constituents listed above shall be monitored at the following frequency, depending on volume generated:

<u>Volume Generated (dry metric tons/year)</u>	<u>Frequency</u>
0 to 290	Annually
290 to 1,500	Quarterly
1,500 to 15,000	Bimonthly (six samples per year)
Greater than 15,000	Monthly

The Discharger shall demonstrate that treated sludge (i.e., biosolids) meets Class A or Class B pathogens reduction levels by one of the methods listed in 40 CFR, Part 503.32.

The Discharger shall track and keep records of the operational parameters used to achieve Vector Attraction Reduction requirements in 40 CFR, Part 503.33(b).

RECLAMATION AREA MONITORING

The Discharger shall perform the following routine monitoring and loading calculations for each discrete irrigation area within the Reclamation Area. Data shall be collected and presented in tabular format and shall include the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Monthly	Application Area	Acres	n/a
Monthly	Wastewater flow	Gallons	Estimated
Monthly	Applied Nitrogen from Wastewater	lb/acre	Calculated
Monthly	Applied Nitrogen from Fertilizer	lb/acre	Estimated

In addition, the Discharger shall inspect the Reclamation Area on a weekly basis. Evidence of erosion, field saturation, runoff, of the presence of nuisance conditions (i.e., flies, ponding, etc.) shall be noted in field logs and included as part of the quarterly monitoring reports.

REPORTING

All monitoring results shall be reported in **Quarterly Monitoring Reports** which are due by the first day of the second month after the calendar quarter. Therefore, monitoring reports are due as follows:

- First Quarter Monitoring Report: **1 May**
- Second Quarter Monitoring Report: **1 August**
- Third Quarter Monitoring Report: **1 November**
- Fourth Quarter Monitoring Report: **1 February**

A transmittal letter shall accompany each monitoring report. The transmittal letter shall discuss any violations that occurred during the reporting period and all actions taken or planned for correcting violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions or a time schedule for implementing the corrective actions, reference to the previous correspondence is satisfactory.

The following information is to be included on all monitoring and annual reports, as well as report transmittal letters, submitted to the Central Valley Water Board:

Discharger Name
Facility Name
MRP Number
Contact Information (telephone number and email)

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner that illustrates clearly, whether the Discharger complies with waste discharge requirements.

In addition to the details specified in Standard Provision C.3, monitoring information shall include the method detection limit (MDL) and the reporting limit (RL) or practical quantitation limit (PQL). If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results for that constituent that are below the RL (or PQL) but above the MDL shall be reported and flagged as estimated.

Laboratory analysis reports do not need to be included in the monitoring reports; however, the laboratory reports must be retained for a minimum of three years in accordance with Standard Provision C.3.

All monitoring reports shall comply with the signatory requirements in Standard Provision B.3. Monitoring data or discussions submitted concerning WWTF performance must also be signed and certified by the chief plant operator. If the chief plant operator is not in direct line of supervision of the laboratory function for a Discharger conducting any of its own analyses, reports must also be signed and certified by the chief of the laboratory.

All monitoring reports that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code Sections 6735, 7835, and 7835.1.

A. All Quarterly Monitoring Reports shall include the following:

Wastewater reporting

1. The results of influent, effluent, and pond monitoring specified on pages 2 and 3.
2. For each month of the quarter, calculation of the maximum daily flow and the monthly average flow.
3. For each month of the quarter, calculation of the 12-month rolling average EC of the discharge using the EC value for that month averaged with the EC values for the previous 11 months.

4. For each month of the quarter, calculation of the monthly average effluent BOD and TSS concentrations, and calculation of the percent removal of BOD and TSS compared to the influent.
5. A summary of the notations made in the pond monitoring log during each quarter. Copies of log pages covering the quarterly reporting period shall not be submitted unless requested by Central Valley Water Board staff.

Groundwater reporting

1. The results of groundwater monitoring specified on pages 3 and 4.
2. For each monitoring well, a table showing groundwater depth, elevation, and constituent concentrations for at least five previous years, up through the current quarter.
3. A groundwater contour map based on groundwater elevations for that quarter. The map shall show the gradient and direction of groundwater flow under/around the facility and/or effluent disposal area(s). The map shall also include the locations of monitoring wells and wastewater storage and discharge areas.

Reclamation Area reporting

1. The results of the routine monitoring and loading calculations specified on page 5.
2. For each month of the quarter, calculation of the monthly hydraulic load for wastewater and supplemental irrigation water in million of gallons to each discrete irrigation area.
3. A summary of the notations made in the Reclamation Area monitoring log during each quarter. The entire contents of the log do not need to be submitted.

B. Fourth Quarter Monitoring Reports, in addition to the above, shall include the following:

Wastewater treatment facility information

1. The names, certificate grades, and general responsibilities of all persons in charge of wastewater treatment and disposal.
2. The names and telephone numbers of persons to contact regarding the WWTF for emergency and routine situations.
3. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibrations (Standard Provision C.4).

4. A statement whether the current operation and maintenance manual, sampling plan, and contingency plan, reflect the WWTF as currently constructed and operated, and the dates when these documents were last reviewed for adequacy.
5. The results of an annual evaluation conducted pursuant to Standard Provision E.4 and a figure depicting monthly average discharge flow for the previous five calendar years.

Source Water reporting, including the results of EC monitoring specified on page 4, and supporting calculations.

Solids/Sludge monitoring

1. Annual production totals in dry tons or cubic yards.
2. A description of disposal methods, including the following information related to the disposal methods used. If more than one method is used, include the percentage disposed of by each method.
 - a. For landfill disposal, include: the name and location of the landfill, and the Order number of WDRs that regulate it.
 - b. For land application, include: the location of the site, and the Order number of any WDRs that regulate it.
 - c. For incineration, include: the name and location of the site where incineration occurs, the Order number of WDRs that regulate the site, the disposal method of ash, and the name and location of the facility receiving ash (if applicable).
 - d. For composting, include: the location of the site, and the Order number of any WDRs that regulate it.

Reclamation Area

1. The type of crop(s) grown in the Reclamation Area, planting and harvest dates, and the quantified nitrogen and fixed dissolved solids uptakes (as estimated by technical references or, preferably, determined by representative plant tissue analysis).
2. The monthly and annual discharge volumes during the reporting year expressed as million gallons and inches.
3. A monthly balance for the reporting year that includes:
 - a. Monthly average ET_o (observed evapotranspiration) – Information sources include California Irrigation Management Information System (CIMIS)
<http://www.cimis.water.ca.gov/>
 - b. Monthly crop uptake

- i. Crop water utilization rates are available from a variety of publications available from the local University of California Davis extension office.
 - ii. Irrigation efficiency – Frequently, engineers include a factor for irrigation efficiency such that the application rate is slightly greater than the crop utilization rate. A conservative design does not include this value.
- c. Monthly average precipitation – this data is available at <http://www.cimis.water.ca.gov/> or at <http://www.ncdc.noaa.gov/oa/climate/online/ccd/nrmlprcp.html>.
- d. Monthly average and annual average discharge flow rate.
- e. Monthly estimates of the amount of wastewater percolating below the root zone (i.e., amount of wastewater applied in excess of crop requirements)

The Discharger shall implement the above monitoring program on the first day of the month following adoption of this Order.

Ordered by:

Pamela C. Credon

PAMELA C. CREEDON, Executive Officer

August 13, 2009

(Date)

DMS/DKP: 6/09/2009

GLOSSARY

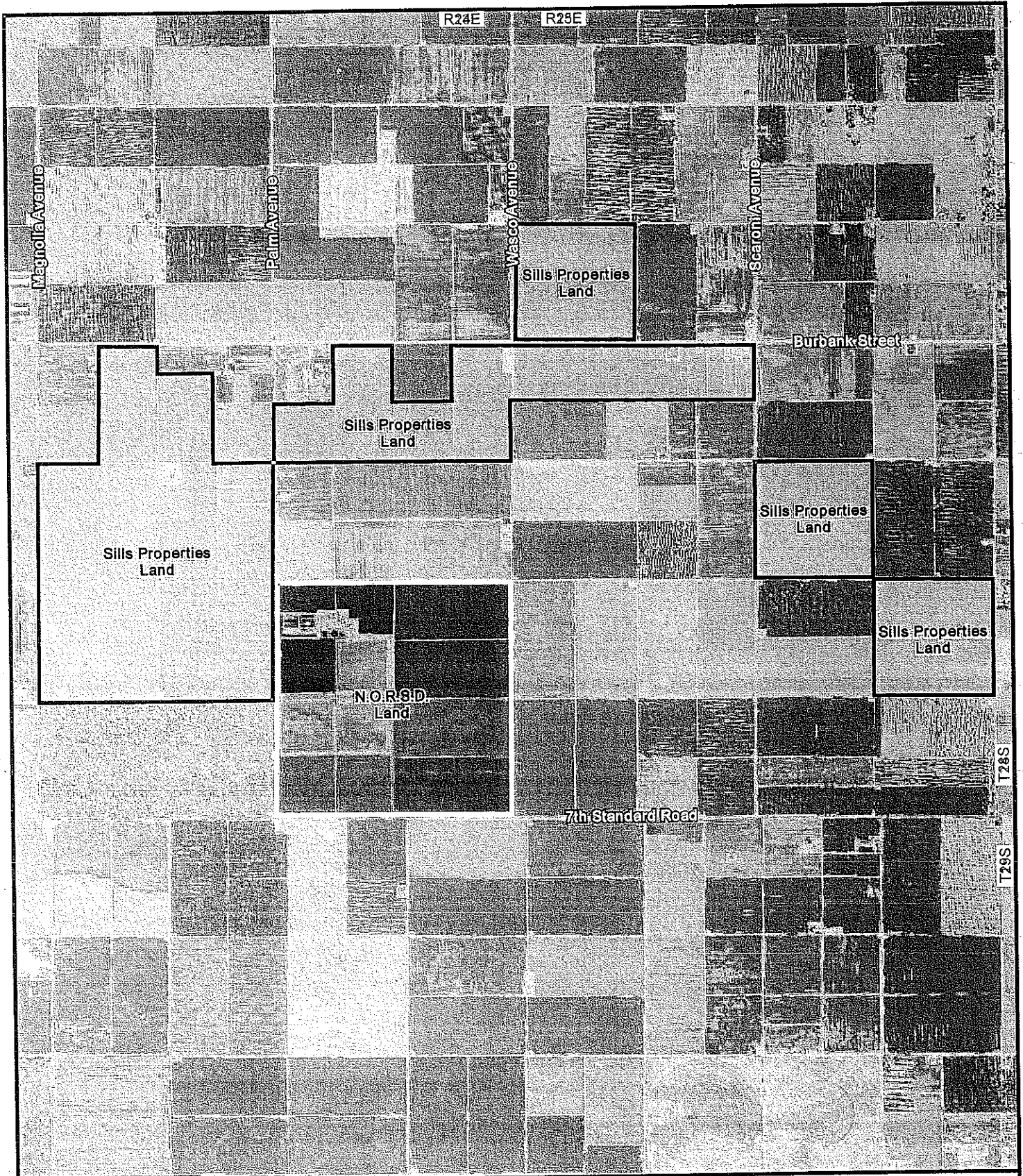
BOD ₅	Five-day biochemical oxygen demand		
CBOD	Carbonaceous BOD		
DO	Dissolved oxygen		
EC	Electrical conductivity at 25° C		
FDS	Fixed dissolved solids		
NTU	Nephelometric turbidity unit		
TKN	Total Kjeldahl nitrogen		
TDS	Total dissolved solids		
TSS	Total suspended solids		
Continuous	The specified parameter shall be measured by a meter continuously.		
24-Hour Composite	Samples shall be a flow-proportioned composite consisting of at least eight aliquots.		
Daily	Samples shall be collected at least every day.		
Twice Weekly	Samples shall be collected at least twice per week on non-consecutive days.		
Weekly	Samples shall be collected at least once per week.		
Twice Monthly	Samples shall be collected at least twice per month during non-consecutive weeks.		
Monthly	Samples shall be collected at least once per month.		
Bimonthly	Samples shall be collected at least once every two months (i.e., six times per year) during non-consecutive months.		
Quarterly	Samples shall be collected at least once per calendar quarter. Unless otherwise specified or approved, samples shall be collected in January, April, July, and October.		
Semiannually	Samples shall be collected at least once every six months (i.e., two times per year). Unless otherwise specified or approved, samples shall be collected in April and October.		
Annually	Samples shall be collected at least once per year. Unless otherwise specified or approved, samples shall be collected in October.		
mg/L	Milligrams per liter		
mL/L	milliliters [of solids] per liter		
µg/L	Micrograms per liter		
µmhos/cm	Micromhos per centimeter		
mgd	Million gallons per day		
MPN/100 mL	Most probable number [of organisms] per 100 milliliters		
General Minerals	Analysis for General Minerals shall include at least the following:		
	Alkalinity	Chloride	Sodium
	Bicarbonate	Hardness	Sulfate
	Calcium	Magnesium	TDS
	Carbonate	Potassium	
	General Minerals analyses shall be accompanied by documentation of cation/anion balance.		

Table 1. Priority Pollutant Scan

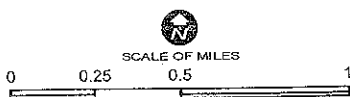
<u>Inorganics</u> ¹	<u>Organics</u>		
Antimony	Acrolein	3-Methyl-4-Chlorophenol	Hexachlorobenzene
Arsenic	Acrylonitrile	Pentachlorophenol	Hexachlorobutadiene
Beryllium	Benzene	Phenol	Hexachlorocyclopentadiene
Cadmium	Bromoform	2,4,6-Trichlorophenol	Hexachloroethane
Chromium (III)	Carbon tetrachloride	Acenaphthene	Indeno(1,2,3-c,d)pyrene
Chromium (VI)	Chlorobenzene	Acenaphthylene	Isophorone
Copper	Chlorodibromomethane	Anthracene	Naphthalene
Lead	Chloroethane	Benzidine	Nitrobenzene
Mercury	2-Chloroethylvinyl Ether	Benzo(a)Anthracene	N-Nitrosodimethylamine
Nickel	Chloroform	Benzo(a)pyrene	N-Nitrosodi-n-Propylamine
Selenium	Dichlorobromomethane	Benzo(b)fluoranthene	N-Nitrosodiphenylamine
Silver	1,1-Dichloroethane	Benzo(g,h,i)perylene	Phenanthrene
Thallium	1,2-Dichloroethane	Benzo(k)fluoranthene	Pyrene
Zinc	1,1-Dichloroethylene	Bis(2-chloroethoxy) methane	1,2,4-Trichlorobenzene
Cyanide	1,2-Dichloropropane	Bis(2-chloroethyl) ether	
Asbestos	1,3-Dichloropropylene	Bis(2-chloroisopropyl) ether	<u>Pesticides</u>
	Ethylbenzene	Bis(2-Ethylhexyl)phthalate	Aldrin
<u>Dioxin Congeners</u>	Methyl Bromide	4-Bromophenyl phenyl ether	alpha-BHC
2,3,7,8-TCDD	Methyl Chloride	Butylbenzyl Phthalate	beta-BHC
1,2,3,7,8-PentaCDD	Methylene Chloride	2-Chloronaphthalene	gamma-BHC (Lindane)
1,2,3,4,7,8-HexaCDD	1,1,2,2-Tetrachloroethane	4-Chlorophenyl Phenyl Ether	delta-BHC
1,2,3,6,7,8-HexaCDD	Tetrachloroethylene (PCE)	Chrysene	Chlordane
1,2,3,7,8,9-HexaCDD	Toluene	Dibenzo(a,h)Anthracene	4,4'-DDT
1,2,3,4,6,7,8-HeptaCDD	1,2-Trans-Dichloroethylene	1,2-Dichlorobenzene	4,4'-DDE
OctaCDD	1,1,1-Trichloroethane	1,3-Dichlorobenzene	4,4'-DDD
2,3,7,8-TetraCDF	1,1,2-Trichloroethane	1,4-Dichlorobenzene	Dieldrin
1,2,3,7,8-PentaCDF	Trichloroethylene (TCE)	3,3'-Dichlorobenzidine	alpha-Endosulfan
2,3,4,7,8-PentaCDF	Vinyl chloride	Diethyl phthalate	beta-Endosulfan
1,2,3,4,7,8-HexaCDF	2-Chlorophenol	Dimethyl phthalate	Endosulfan Sulfate
1,2,3,6,7,8-HexaCDF	2,4-Dichlorophenol	Di-n-Butyl Phthalate	Endrin
1,2,3,7,8,9-HexaCDF	2,4-Dimethylphenol	2,4-Dinitrotoluene	Endrin Aldehyde
2,3,4,6,7,8-HexaCDF	2-Methyl-4,6-Dinitrophenol	2,6-Dinitrotoluene	Heptachlor
1,2,3,4,6,7,8-HeptaCDF	2,4-Dinitrophenol	Di-n-Octyl Phthalate	Heptachlor epoxide
1,2,3,4,7,8,9-HeptaCDF	2-Nitrophenol	1,2-Diphenylhydrazine	Polychlorinated biphenyls
OctaCDF	4-Nitrophenol	Fluoranthene	Toxaphene
		Fluorene	

¹ With the exception of wastewater samples, samples placed in an acid-preserved bottle for metals analysis must first be filtered. If filtering in the field is not feasible, samples shall be collected in unpreserved containers and submitted to the laboratory within 24 hours with a request (on the chain of custody form) to immediately filter then preserve the sample.

² Samples to be analyzed for volatile compounds and phthalate esters shall be grab samples; the remainder shall be 24-hour composite samples.

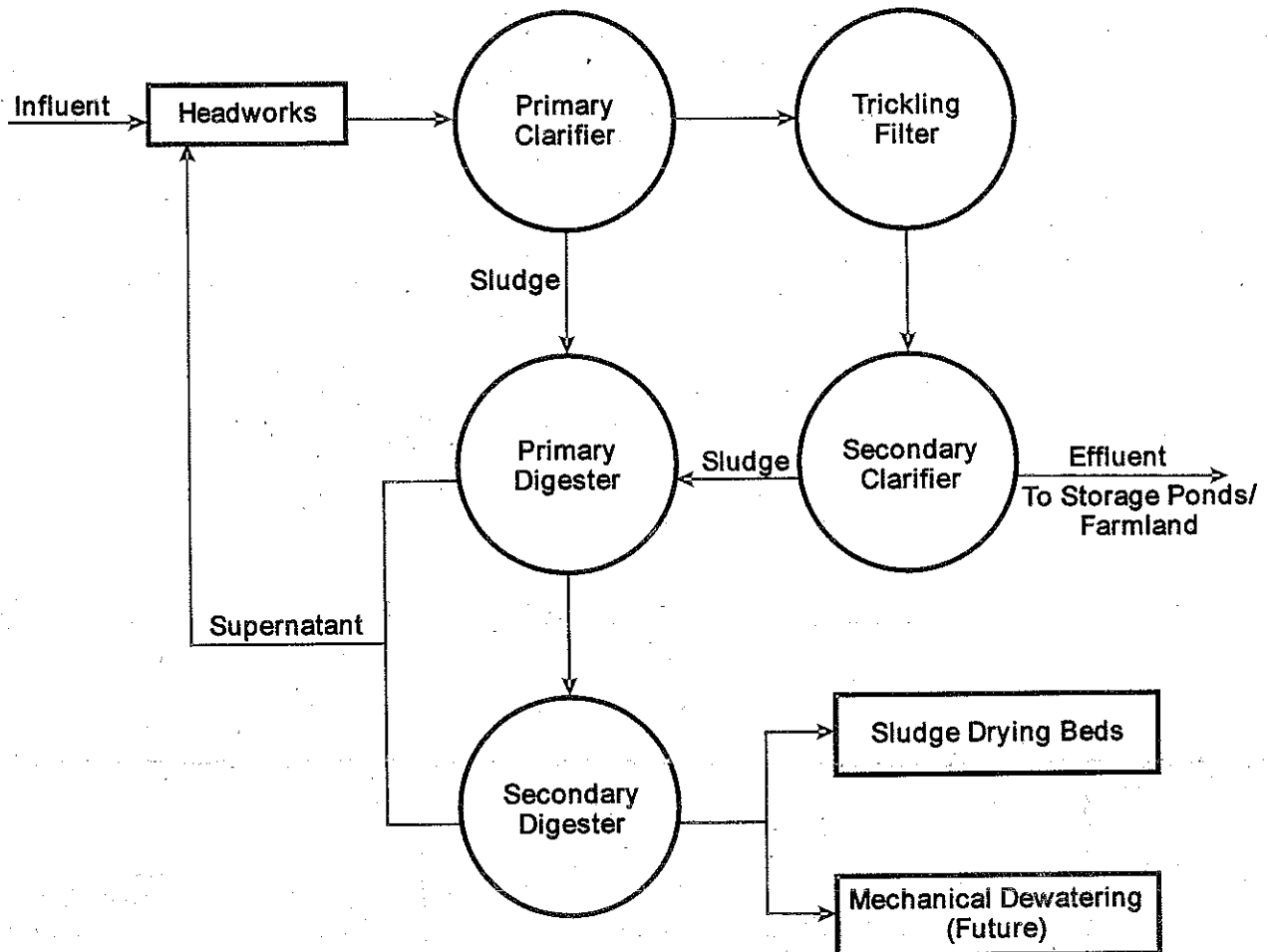


Map Source:
NAIP Aerial Photograph (2005)



SITE MAP
 WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2009-0088
 FOR
 NORTH OF RIVER SANITARY DISTRICT NO. 1
 AND
 SILLS PROPERTIES, INC.
 WASTEWATER TREATMENT FACILITY AND
 WATER RECLAMATION
 KERN COUNTY

ATTACHMENT A



NOT TO SCALE

PROCESS FLOW DIAGRAM
 WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2009-0088
 FOR
 NORTH OF RIVER SANITARY DISTRICT NO. 1
 AND
 SILLS PROPERTIES, INC.
 WASTEWATER TREATMENT FACILITY AND
 WATER RECLAMATION
 KERN COUNTY

ATTACHMENT B



NONPOTABLE WATER INTERNATIONAL SYMBOL
WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2009-0088
FOR
NORTH OF RIVER SANITARY DISTRICT NO. 1
AND
SILLS PROPERTIES, INC.
WASTEWATER TREATMENT FACILITY AND
WATER RECLAMATION
KERN COUNTY

ATTACHMENT C

ORDER NO. 2009-0088
ATTACHMENT D
STANDARD REQUIREMENTS FOR
MONITORING WELL INSTALLATION WORK PLANS AND
MONITORING WELL INSTALLATION REPORTS

Prior to installation of groundwater monitoring wells, the Discharger shall submit a work plan containing, at a minimum, the information listed in Section 1, below. Wells may be installed after staff approve the work plan. Upon installation, the Discharger shall submit a well installation report that includes the information contained in Section 2, below. All work plans and reports must be prepared under the direction of, and certified by, a California registered geologist or civil engineer.

SECTION 1 - Monitoring Well Installation Work Plan and
Groundwater Sampling and Analysis Plan

The monitoring well installation work plan shall contain, at a minimum, the following information:

A. General Information:

- Purpose of the well installation project
- Brief description of local geologic and hydrogeologic conditions
- Proposed monitoring well locations and rationale for well locations
- Topographic map showing facility location, roads, and surface water bodies
- Large-scaled site map showing all existing on-site wells, proposed wells, surface water bodies and drainage courses, buildings, waste handling facilities, utilities, and major physical and man-made features

B. Drilling Details:

- On-site supervision of drilling and well installation activities
- Description of drilling equipment and techniques
- Equipment decontamination procedures
- Cuttings disposal methods
- Soil sampling intervals (if appropriate); logging methods; number and location of soil samples and rationale; and sample collection, preservation, and analytical methods

C. Monitoring Well Design (in graphic form with rationale provided in narrative form):

- Diagram of proposed well construction details
 - Borehole diameter
 - Casing and screen material, diameter, and centralizer spacing (if needed)
 - Type of well caps (bottom cap either screw on or secured with stainless steel screws)
 - Anticipated depth of well, length of well casing, and length and position of perforated interval

- Thickness, position and composition of surface seal, sanitary seal, and sand pack
- Anticipated screen slot size and filter pack

D. Well Development (not to be performed until at least 48 hours after sanitary seal placement):

- Method of development to be used (i.e., surge, bail, pump, etc.)
- Parameters to be monitored during development and record keeping technique
- Method of determining when development is complete
- Disposal of development water

E. Well Survey (precision of vertical survey data shall be at least 0.01 foot):

- Identify the Licensed Land Surveyor or Civil Engineer that will perform the survey
- Datum for survey measurements
- List well features to be surveyed (i.e., top of casing, horizontal and vertical coordinates, etc.)

F. Schedule for Completion of Work

G. Appendix: Groundwater Sampling and Analysis Plan (SAP)

The Groundwater SAP, a guidance document that is referred to by individuals responsible for conducting groundwater monitoring and sampling activities, shall contain, at a minimum, a detailed written description of standard operating procedures for:

- Equipment to be used during sampling
- Equipment decontamination procedures
- Water level measurement procedures
- Well purging (include a discussion of procedures to follow if three casing volumes cannot be purged)
- Monitoring and record keeping during water level measurement and well purging (include copies of record keeping logs to be used)
- Purge water disposal
- Analytical methods and required reporting limits
- Sample containers and preservatives
- Sampling
 - General sampling techniques
 - Record keeping during sampling (include copies of record keeping logs to be used)
 - QA/QC samples
- Chain of Custody
- Sample handling and transport

SECTION 2 - Monitoring Well Installation Report

The monitoring well installation report must provide the information listed below. In addition, the report must also clearly identify, describe, and justify any deviations from the approved work plan.

A. General Information:

Purpose of the well installation project

Number of monitoring wells installed and identifying label(s) for each

Brief description of geologic and hydrogeologic conditions encountered during well installation

Topographic map showing facility location, roads, surface water bodies

Large-scaled site map showing all previously existing wells, newly installed wells, surface water bodies and drainage courses, buildings, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details (in narrative and/or graphic form):

On-site supervision of drilling and well installation activities

Drilling contractor and driller's name

Description of drilling equipment and techniques

Equipment decontamination procedures

Well boring log (provide for each well)

- Well boring number and date drilled
- Borehole diameter and total depth
- Total depth of open hole (i.e., total depth drilled if no caving or back-grouting occurs)
- Depth to first encountered groundwater and stabilized groundwater depth
- Detailed description of soils encountered, using the Unified Soil Classification System

C. Well Construction Details (provide for each well):

Well construction diagram including:

- Monitoring well number and date constructed
- Casing and screen material, diameter, and centralizer spacing (if needed)
- Length of well casing
- Length and position of slotted casing and size of perforations
- Thickness, position and composition of surface seal, sanitary seal, and sand pack
- Type of well caps (bottom cap either screw on or secured with stainless steel screws)

E. Well Development (provide for each well):

- Date(s) and method of development
- How well development completion was determined
- Volume of water purged from well and method of development water disposal

F. Well Survey (provide for each well):

- Reference elevation at the top rim of the well casing with the cap removed (feet above mean sea level to within 0.01 foot)
- Ground surface elevation (feet above mean sea level to within 0.01 foot)
- Horizontal geodetic location, where the point of beginning shall be described by the California State Plane Coordinate System, 1983 datum, or acceptable alternative (provide rationale)
- Present the well survey report data in a table

G. Water Sampling:

- | | |
|---|-----------------------------------|
| Date(s) of sampling | Sample identification |
| How well was purged | Analytical methods used |
| How many well volumes purged | Laboratory analytical data sheets |
| Levels of temperature, EC, and pH at stabilization | Water level elevation(s) |
| Sample collection, handling, and preservation methods | Groundwater contour map |

H. Soil Sampling (if applicable):

- Date(s) of sampling
- Sample collection, handling, and preservation methods
- Sample identification
- Analytical methods used
- Laboratory analytical data sheets
- Present soil sampling data in a table

I. Well Completion Report(s) (as defined in California Water Code §13751). Blank forms are available from California Department of Water Resources' website www.water.ca.gov. Submit this section under separate cover.

J. Appendix - include, at a minimum, copies of the following:

- County-issued well construction permits
- Registered engineer or licensed surveyor's report and field notes
- Field notes from well development

ORDER NO. 2009-0088
ATTACHMENT E
STANDARD REQUIREMENTS FOR
SLUDGE MANAGEMENT PLAN

A. Wastewater Treatment Facility (WWTF)

1. Describe treatment processes at the wastewater treatment facility.
2. List significant industrial users (SIUs) that discharge to the wastewater treatment facility and describe how SIUs affect sludge production, sludge handling, and biosolids disposal.
3. Indicate whether the WWTF has an adopted source control ordinance or a pretreatment program, and if the latter whether the program is approved by the Board.
4. Indicate whether WWTF accepts septage and, if so, describe septage handling operation facilities.
5. Provide a WWTF site map showing:
 - a. existing sludge handling facilities (e.g., sludge drying beds and sludge storage areas)
 - b. abandoned sludge handling facilities (if applicable)
 - c. location of groundwater monitoring wells, if any, and groundwater gradient.

B. Sludge Production

1. Provide a schematic diagram showing solids flow and sludge handling operations; include, where applicable, supernatant flow and handling operations.
2. Specify the quantity of sludge expected to annually accumulate in each wastewater treatment process, how it is quantified, and the expected removal frequency.
3. For sludge handling facilities with sludge drying beds:
 - a. Describe number and size of sludge drying beds.
 - b. Describe sludge drying bed construction (e.g., liner, leachate collection system).
 - c. If sludge drying beds are not lined, thoroughly describe measures taken to ensure that area groundwater is not adversely affected by sludge drying operations.
 - d. Indicate the expected frequency with which sludge will be applied to and removed from sludge drying beds.
4. Describe how biosolids are transferred to onsite biosolids storage facility (if applicable). If biosolids are removed directly from sludge drying beds, provide a plan that indicates when during the year you expect to dispose of biosolids and explain that whoever is responsible for disposing of your biosolids will be able to remove and dispose it at this time.

ATTACHMENT E
STANDARD REQUIREMENTS FOR
SLUDGE MANAGEMENT PLAN

C. Biosolids Characterization

1. Describe proposed sampling procedures by indicating number of samples, sample locations, and sample composition. For reference consult *POTW Sludge Sampling an Analysis Guidance Document*, published by the EPA Publication No. 833-B-89-100.
2. Describe the methods proposed to meet the necessary levels of pathogen reduction (i.e., Class A or B according to 40 CFR 503.32) for the proposed method of sludge disposal.
3. Describe the methods proposed to meet vector reduction requirements, in accordance with 40 CFR Part 503.33.

D. Biosolids Storage

1. If on-site biosolids storage is used,
 - a. Describe:
 - i. Size of biosolids storage area
 - ii. How frequently it will be used (emergency basis only or routine use)
 - iii. Typical storage duration
 - iv. Leachate controls
 - v. Erosion controls
 - vi. Run-on/runoff controls
 - b. Indicate measures that will be taken to ensure that area groundwater is not adversely affected by the biosolids storage facility.
 - c. For biosolids storage facilities that contain biosolids between 1 October and 30 April, describe how facilities are designed and maintained to prevent washout or inundation from a storm or flood with a return frequency of 100 years.
 - d. Provide a map of showing setback distances from (where applicable)
 - i. Property lines
 - ii. Domestic water supply wells
 - iii. Non-Domestic water supply wells
 - iv. Public roads and occupied onsite residences
 - v. Surface waters, including wetlands, creeks, ponds, lakes, underground aqueducts, and marshes

ATTACHMENT E
STANDARD REQUIREMENTS FOR
SLUDGE MANAGEMENT PLAN

- vi. Primary agricultural drainage ways
- vii. Occupied non-agricultural buildings and off-site residences
- viii. Primary tributary to a waterway or reservoir used for domestic water supply
- ix. Domestic surface water supply intake

E. Spill Response Plan

1. Emergency contacts and notification procedures
2. Personal protective equipment requirements
3. Response instructions for
 - a. spill during biosolids transport
 - b. storage facility failure
 - c. when hazardous or other unauthorized material is found

F. Method of Disposal

1. Describe and provide the following information related to biosolids disposal method(s). If more than one method will be utilized, include the percentage of annual biosolids production expected to be disposed of by each method.
 - a. Landfill Disposal
 - i. Name(s) and location(s) of landfill(s).
 - ii. Waste discharge requirements order numbers adopted by the Regional Board that regulate the landfill(s).
 - iii. Present classification of the landfill(s).
 - iv. Name and telephone number of the contact person at the landfill(s).
 - b. Incineration
 - i. Name(s) and location(s) of incineration site(s).
 - ii. Waste discharge requirements order numbers adopted by the Regional Board that regulate the incineration site(s).
 - iii. Method of disposal of ash from the incineration site(s).
 - iv. Names and locations of facilities receiving ash from the incineration site(s), if applicable.
 - v. Name and telephone number of the contact person at the incineration site(s).

ATTACHMENT E

STANDARD REQUIREMENTS FOR
SLUDGE MANAGEMENT PLAN

c. Composting

- i. Name(s) and location(s) of composting site(s).
- ii. Waste discharge requirements order numbers adopted by the Regional Board that regulate the composting site(s).
- iii. Name and telephone number of the contact person at the composting site(s).

d. Land Application

- i. Ownership of the site(s) where biosolids are applied.
- ii. Assessor Parcel Numbers (APNs) of site(s) where biosolids are applied.
- iii. Waste discharge requirements order numbers adopted by the Regional Board that regulate the biosolids application site(s).

ORDER NO. 2009-0088
ATTACHMENT F
STANDARD REQUIREMENTS FOR
NUTRIENT MANAGEMENT PLANS
FOR
WASTEWATER TREATMENT FACILITIES

The purpose of the Nutrient Management Plan (NMP) is to budget and manage nutrients applied to land application area(s) considering all sources of nutrients, crop requirements, soil types, climate, and local conditions in order to prevent adverse impacts to surface water and groundwater quality. The NMP must take site-specific conditions into consideration in identifying steps that will minimize nutrient movement through surface runoff or leaching past the root zone.

The NMP must contain, at a minimum, all the elements listed below under Contents of a Nutrient Management Plan and must be updated in response to changing conditions, monitoring results, and other factors.

A specialist who is certified in developing nutrient management plans shall develop the NMP. A certified specialist is a Professional Soil Scientist, Professional Agronomist, or Crop Advisor certified by the American Society of Agronomy or a Technical Service Provider certified in nutrient management in California by the Natural Resources Conservation Service (NRCS). The Executive Officer may approve alternative proposed specialists. Only NMPs prepared and signed by these parties will be considered certified.

The Monitoring and Reporting Program specifies minimum amounts of monitoring that must be conducted at the wastewater treatment facility (WWTF). As indicated below, this information must be used to make management decisions related to nutrient management. Likewise, the timing and amounts of wastewater applications to crops must be known to correctly calculate the amount of storage needed.

Waste and land application areas shall be managed to prevent contamination of crops grown for human consumption. The term "crops grown for human consumption" refers only to crops that will not undergo subsequent processing which adequately removes potential microbial danger to consumers.

Contents of a Nutrient Management Plan

The NMP shall identify the name, address of owner and operator and shall contain all of the following elements to demonstrate that the Discharger can control nutrient losses that may impact surface water or groundwater quality and comply with the requirements of the Order.

1. Land Application Area Information

- a. Identify each land application area (whether it is owned, rented, or leased, to which wastewater and/or solids/sludge may be applied) on a single published base map (topographic map or aerial photo) at an appropriate scale which includes:
 - 1) A field identification system (Assessor's Parcel Number; land application area by name or number; total acreage of each land application area; crops grown; owner; indication of what types of waste are applied (wastewater only, solids/sludge only, or both wastewater and solids/sludge); drainage flow direction in each field, nearby surface waters, and storm water discharge points; tailwater and storm water drainage controls; subsurface (tile) drainage systems (including discharge points and lateral extent); irrigation supply wells and groundwater monitoring wells; sampling locations for discharges of storm water and tailwater to surface water from the field; and
 - 2) Wastewater conveyance structures, discharge points and discharge mixing points with irrigation water supplies; pumping facilities; flow meter locations; drainage ditches and canals, culverts, drainage controls (berms, levees, etc.), and drainage easements.
- b. Provide the following information for each land application area identified in 1.a above:
 - 1) Field's common name (name used when keeping records of waste applications).
 - 2) Assessor's Parcel Number.
 - 3) Total acreage.
 - 4) Crops grown and crop rotation.
 - 5) Information on who owns and leases the field.
 - 6) Proposed sampling locations for discharges of storm water and tailwater to surface water.

- c. Provide copies of written agreements with third parties that receive wastewater from the Discharger's WWTF.
 - 1) The Discharger shall have a written agreement with each third party that receives process wastewater from the Discharger. Each written agreement shall be included in the Discharger's Nutrient Management Plan. The written agreement shall identify:
 - i. The Discharger and WWTF from which the wastewater originates;
 - ii. The third party that will receive wastewater;
 - iii. The Assessor's Parcel Number(s) and the acreage(s) of the cropland where the wastewater will be applied; and
 - iv. The types of crops to be irrigated with the wastewater.
 - v. The length of time the agreement will be in effect.

2. Available Nutrients

- a. All sources of nutrients (nitrogen, phosphorus, and potassium) available for each crop in each land application area shall be identified prior to land applications. Potential nutrient sources include, but are not limited to, wastewater, solids/sludge, manure, irrigation water, commercial fertilizers, soil, and previous crops.
- b. Nutrient values of soil, wastewater, solids/sludge, manure, and irrigation water shall be determined based on laboratory analysis. "Book values" may be used for planning of waste applications during the first two years during initial development of the NMP if necessary. Acceptable book values are those values recognized by American Society of Agricultural and Biological Engineers (ASABE), the NRCS, and/or the University of California that accurately estimate the nutrient content of the material. The nutrient content of commercial fertilizers shall be derived from California Department of Food and Agriculture published values.
- c. Nutrient credit from previous legume crops shall be determined by methods acceptable to the University of California Cooperative Extension, the NRCS, or a specialist certified in developing nutrient management plans.

3. Nutrient Budget

The NMP shall include a nutrient budget for each land application area. The nutrient budget shall establish planned rates of nutrient applications. The Nutrient Budget shall include the following:

a. Nutrient Application Rates

- 1) The rate of application of wastewater and solids/sludge for each crop in each land application area (also considering sources of nutrients other than wastewater or solids/sludge) to meet each crop's needs without exceeding application rates specified.
- 2) Planned rates of nutrient application shall be determined based on soil test results, crop tissue test results, nutrient credits, wastewater, solids/sludge, and manure analysis, crop requirements and growth stage, seasonal and climatic conditions, and use and timing of irrigation water.
- 3) Each crop's nutrient requirements for nitrogen, phosphorus, and potassium shall be determined based on recommendations from the University of California, the *Western Fertilizer Handbook* (9th Edition), or from historic crop nutrient removal.
- 4) Nutrient application rates shall not attempt to approach a site's maximum ability to contain one or more nutrients through soil adsorption. Excess applications or applications that cause soil imbalances are to be avoided.
- 5) Total nitrogen applications to a land application area prior to and during the growing of a crop will be based on pre-plant or pre-side dress soil analysis to establish residual nitrogen remaining in the field from the previous crop to establish early season nitrogen applications. Pre-plant or side dress nitrogen applications will not exceed the estimated total crop use as established by the nutrient management plan. Except as allowed below, application rates shall not result in total nitrogen applied to the land application areas exceeding 1.4 times the nitrogen that will be removed from the field in the harvested portion of the crop. Additional applications of nitrogen are allowable if the following conditions are met:
 - i. Plant tissue testing has been conducted and it indicates that additional nitrogen is required to obtain a crop yield typical for the soils and other local conditions;
 - ii. The amount of additional nitrogen applied is based on the plant tissue testing and is consistent with University of California Cooperative Extension written guidelines or written recommendations from a professional agronomist;
 - iii. The form, timing, and method of application facilitates timely nitrogen availability to the crop; and

- iv. Records are maintained documenting the need for additional applications.
- 6) Phosphorus and potassium may be applied in excess of crop uptake rates. If, however, monitoring indicates that levels of these elements are causing adverse impacts, corrective action must be taken. Cessation of applications may be necessary until crop uptake and harvest have reduced the concentration in the soil.
- 7) Plans for nutrient management shall specify the form, source, amount, timing, and method of application of nutrients on each land application area to minimize nitrogen and/or phosphorus movement to surface and/or ground waters to the extent necessary to meet the provisions of the Order.
- 8) Where crop material is not removed from the land application area or the land grazed, waste applications are not allowed. For example, if a pasture is not grazed or mowed (and cuttings removed from the land application area), waste shall not be applied to the pasture.
- 9) Wastewater and/or solids/sludge will be applied to the land application area for use by the first crop covered by the NMP only to the extent that soil tests indicate a need for nitrogen application.
- 10) Supplementary commercial fertilizer(s) and/or soil amendments may be added when the application of nutrients contained in wastewater and/or solids/sludge alone is not sufficient to meet the crop needs, as long as these applications do not exceed provisions of the Order.
- 11) Nutrient applications to a crop shall not be made prior to the harvest of the previous crop except where the reason for such applications is provided in the NMP.
- 12) Water applications shall not exceed the amount needed for efficient crop production.
- 13) Nutrients shall be applied in such a manner as not to degrade the soil's structure, chemical properties, or biological condition.

Nutrients are being evaluated in several Central Valley surface waters. Where these studies show that nutrients are adversely impacting beneficial uses, the Central Valley Water Board will work with parties in the watershed, including WWTF, to reduce discharges of phosphorus, nitrogen and possibly other constituents.

b. Nutrient Application Timing

- 1) Wastewater application scheduling should be based on the nutrient needs of the crop, the daily water use of the crop, the water holding capacity of the soil, and the lower limit of soil moisture for each crop and soil.
- 2) Wastewater shall not be applied when soils are saturated. During the rainy season rainfall can exceed crop water demand; however, the application of wastewater is allowable if tests show that there is an agronomic need and current conditions indicate that threat of nitrate leaching is minimal.
- 3) The timing of nutrient application must correspond as closely as possible with plant nutrient uptake characteristics, while considering cropping system limitations, weather and climatic conditions, and land application area accessibility.
- 4) Nutrient applications for spring-seeded crops shall be timed to avoid surface runoff and leaching by winter rainfall.

c. Nutrient Application Method

- 1) The Discharger shall apply nutrient materials uniformly to application areas or as prescribed by precision agricultural techniques.
- 2) Realistic yield goals for each crop in each land application area shall be established. For new crops or varieties, industry yield recommendations may be used until documented yield information is available.
- 3) If the NMP shows that the nutrients generated by the WWTF exceed the amount needed for crop production in the land application area, the Discharger must implement management practices (such as offsite removal of the excess nutrients, treatment, or storage) that will prevent impacts to surface water or groundwater quality due to excess nutrients.

4. Setbacks, Buffers, and Other Alternatives to Protect Surface Water

- a. A setback is a specified distance from surface waters or potential conduits to surface waters where wastewater and solids/sludge may not be land applied, but where crops may continue to be grown.
- b. A vegetated buffer is a narrow, permanent strip of dense perennial vegetation where no crops are grown and which is established parallel to the contours of and perpendicular to the dominant slope of the land application area for the purposes of slowing water runoff, enhancing water infiltration, trapping pollutants bound to

sediment, and minimizing the risk of any potential nutrients or pollutants from leaving the land application area and reaching surface waters.

- c. The minimum widths of setbacks and vegetated buffers must be doubled around the wellhead of a drinking water supply well constructed in a sole-source aquifer.
- d. Practices and management activities for vegetated buffers include the following:
 - 1) Removal of vegetation in vegetated buffers in accordance with site production limitations, rate of plant growth, and the physiological needs of the plants.
 - 2) Not mowing below the recommended height for the plant species.
 - 3) Maintaining adequate ground cover and plant density to maintain or improve filtering capacity of the vegetation.
 - 4) Maintaining adequate ground cover, litter, and canopy to maintain or improve infiltration and soil condition.
 - 5) Periodic rest from mechanical harvesting, which may be needed to maintain or restore the desired plant community following episodic events such as drought.
 - 6) Implementing pest management to protect the desired plant communities.
When needs are a significant problem
 - 7) Preventing channels from forming.
- e. For each land application area that is within 100 feet of a surface water or a conduit to surface water, identify the setback, vegetated buffer, or other alternative practice that will be implemented to protect surface water.

5. Record-Keeping

The Discharger shall maintain records for each land application area identified in 1.a above and as required in the Monitoring and Reporting Program No. R5-2009-0088.

6. Nutrient Management Plan Review

- a. Identify the schedule for review and revisions to the NMP.
- b. Identify the person who will conduct the NMP review and revisions.
- c. Provide the name and contact information (including address and phone number) of the person who created the NMP; the date that the NMP was drafted; the name,

title, and contact information of the person who approved the final NMP; and the date of NMP implementation.

- d. The NMP shall be updated prior to any anticipated changes that would affect the overall nutrient balance or the nutrient budget such as, but not limited to, a crop rotation change, changes in the available cropland, or the changes in the volume of wastewater generated.
- e. The Discharger shall review the NMP at least once every five years and notify the Central Valley Regional Board in the annual report of any proposed changes that would affect the NMP.

INFORMATION SHEET

INFORMATION SHEET – ORDER NO. R5-2009-0088
NORTH OF RIVER SANITARY DISTRICT NO.1 AND
SILLS PROPERTIES, INC.
WASTEWATER TREATMENT PLANT AND
WATER RECLAMATION
KERN COUNTY

Background

North of River Sanitary District No. 1 owned and operated a Wastewater Treatment Facility (WWTF) near Oildale. The WWTF was regulated by Waste Discharge Requirements (WDRs) Order No. 92-016 that authorized the discharge of 5.5 million gallons per day (mgd) of undisinfected secondary treated wastewater to four unlined storage ponds and to 780 acres of Reclamation Area. Water Reclamation Requirements (WRRs) Order No. 92-019 regulated the discharge to 1,565 acres of Reclamation Area owned and operated by Sill Properties Inc. In 1999, the District completed the construction of its new WWTF about three and a half miles west of the City of Shafter, near its effluent storage ponds, and abandoned its previous WWTF. The Discharger is currently operating the new WWTF under the WDRs issued to the old WWTF.

The new WWTF consist of headworks with two mechanical bar screens, a lift station, a vortex grit removal system, addition of coagulant (Ferric Chloride) and Polymer, a primary clarifier, a plastic media trickling filter, a secondary clarifier, primary and secondary sludge digesters operating in series, and fourteen unlined sludge drying beds. The effluent is used to irrigate alfalfa, wheat, and corn that are used as fodder, fibber, and seed crops for nonhuman consumption. When irrigation demand is low, effluent is sent to four storage ponds with a total storage capacity of approximately 1,488 acre-feet.

The Discharger submitted a Report of Waste Discharge dated December 2008 where it proposed an interim expansion from 5.5 mgd to 7.5 mgd. The Discharger intends to have an ultimate capacity of 12 mgd in the near future.

For the interim expansion the District purchased 320 acres of Reclamation Area (Assessor's Parcel No. 088-210-05) located in Section 36 of Township T28S, Range R24E, MDB&M. The Discharger proposes to recycle wastewater on approximately 2,380 acres of farmland, of which 1,740 acres are owned by Sill Properties Inc. The other 640 acres are owned by the Sanitary District. Approximately 1,950 acres of land will be farmed, 1,080 acres will be used to grow alfalfa, 490 acres to grow wheat, and 380 acres to grow corn.

Both WDRs Order No. 92-016 and WRRs Order No. 92-019 are being consolidated and updated by this Order. The Order assigns the Sanitary District as the primary entity responsible for the WWTF. Sill Properties Inc. is the primary entity, and the Sanitary District the secondary entity, responsible for the application of recycled wastewater and compliance the water recycling requirements of this Order.

Solids and Biosolids Disposal

Sludge is dried in twelve unlined sludge drying beds. Once the sludge is dry, it is applied as a soil amendment of 80 acres owned by the Discharger. Approximately 570 tons of dry sludge is applied to the 80 acres annually, with loading rates of 7.11 tons per acre per year.

Because the unlined sludge drying beds are a potential source of groundwater degradation, the Discharger is proposing to install mechanical dewatering facilities.

Groundwater Conditions

The groundwater monitoring network consists of two wells (MW-1 and MW-2). Groundwater Monitoring Well # 1 is located on the Southeast corner of the WWTF along Seventh Standard Road. Well # 2 is located on the Northwest corner of the WWTF on the intersection of Magnolia Avenue and Burbank Street. Both wells have a depth of 400 feet bgs and have screened intervals of 20 ft, 80 ft, and 100 ft at three different zones.

Having multiple screened intervals within a monitoring well does not provide an adequate representation of groundwater quality. However, based on the two monitoring wells groundwater appears to be of marginal quality. The flow gradient and quality of first-encountered groundwater near the WWTF cannot be determined with two monitoring wells, a minimum of three wells are needed. The Discharger needs to install an adequate groundwater monitoring network and conduct a groundwater investigation to determine the quality of first-encountered groundwater, and at what depth it occurs.

Compliance History

The most recent Notice of Violation (NOV) was issued to the Sanitary District on 25 August 2008 for violating Standard Provisions C.5 and B.2, the Sanitary District did not have a written sampling program and did not have a spill prevention and control plan, respectively.

In response to the NOV, the Sanitary District submitted a Wastewater Treatment Plant Sampling Manual, and a Wastewater Treatment Plan Spill Prevention Response Plan in October 2008.

In 2006, the average effluent EC was approximately 794 $\mu\text{mhos/cm}$; this exceeded the Basin Plan limit of source water + 500 $\mu\text{mhos/cm}$ ($252 \mu\text{mhos/cm} + 500 \mu\text{mhos/cm} = 752 \mu\text{mhos/cm}$). These exceedances resulted in several violations documented in CIWQS. In 2007, source water EC was reported at 544 $\mu\text{mhos/cm}$, which increased the effluent EC limit to 1,044 $\mu\text{mhos/cm}$. The average effluent EC for 2007 was approximately 855 $\mu\text{mhos/cm}$; therefore, there were no exceedances that year. In 2008 source water EC was reported as approximately 381 $\mu\text{mhos/cm}$, this would correspond to an effluent EC limit of 881 $\mu\text{mhos/cm}$. The average effluent EC for 2008 had a concentration of 818 $\mu\text{mhos/cm}$; therefore, in 2008 the effluent EC did not exceed the effluent EC limit established by the Basin Plan.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The Basin Plan indicates the greatest long-term water quality problem facing the entire Tulare Lake Basin is increasing salinity in groundwater, a process accelerated by man's activities and particularly affected by intensive irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until there is a long-term solution to the salt imbalance. The Central Valley Water Board encourages proactive management of waste stream by dischargers to control addition of salt through use, and has established an incremental EC

limitation of 500 $\mu\text{mhos/cm}$ or a 1,000 $\mu\text{mhos/cm}$, as the measure of the maximum permissible addition of salt constituents through use.

The Basin Plan states that discharges to areas that may recharge good quality groundwaters shall not exceed an EC of 1,000 $\mu\text{mhos/cm}$, a chlorine content of 175 mg/L, or boron content of 1.0 mg/L.

Antidegradation

The antidegradation directives of State Water Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality Water In California," or "Antidegradation Policy" require that waters of the State that are better in quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State." Water can be of high quality for some constituents or beneficial uses and not others. Policy and procedures for complying with directives are set forth in the Basin Plan. Degradation of groundwater by some of the typical waste constituents released with discharge from a municipal wastewater utility after effective source control, treatment, and control is consistent with maximum benefit to the people of the State. The technology, energy, water recycling, and waste management advantages of municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impact on water quality will be substantially less. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, provided terms of the Basin Plan are met.

Constituents of concern in the discharge that have the potential to degrade groundwater include salts and nutrients. However, the discharge will likely not impair the beneficial uses of groundwater because:

- a. For nitrogen, shallow groundwater already contains nitrate concentrations in excess of water quality objectives as a result of previous discharges and agricultural practices in the area. This Order includes a time schedule to meet an effluent nitrogen limit of 10 mg/L and/or demonstrate management practices to preclude any further degradation for nitrates.
- b. For Salinity, the Basin Plan contains effluent limits for EC of source water plus 500 $\mu\text{mhos/cm}$ and 1,000 $\mu\text{mhos/cm}$ maximum for discharges to areas that may recharge to good quality groundwater. These limits considered the antidegradation policy when adopted. Effluent from the WWTF is approximately 820 $\mu\text{mhos/cm}$ and meets the Basin Plan limits. Ambient shallow groundwater is of marginal quality with EC concentrations that appears to be greater than 1,000 $\mu\text{mhos/cm}$; therefore, degradation would not occur. If further groundwater studies indicate natural background quality for salinity is less than 820 $\mu\text{mhos/cm}$, this Order will be reopened to consider degradation.

Treatment Technology and Control

The expansion project will provide treatment and control of the discharge that incorporates:

- a. Secondary treatment of the wastewater;
- b. Pretreatment monitoring and compliance assessment;
- c. Recycling of wastewater for crop irrigation;
- d. Appropriate biosolids handling and treatment for reuse;
- e. An operation and maintenance (O&M) manual;
- f. Certified operators to insure proper operation and maintenance; and
- g. Discharge and groundwater monitoring.

Title 27

Title 27, CCR, section 20005 et seq. (Title 27) contains regulations to address certain discharges to land. Title 27 establishes a waste classification system, specifies siting and construction standards for full containment of classified waste, requires extensive monitoring of groundwater and the unsaturated zone for any indication of failure of containment, and specifies closure and post-closure maintenance requirements. Generally, no degradation of groundwater quality by any waste constituent in a classified waste is acceptable under Title 27 regulations.

Discharges of domestic sewage and treated effluent can be treated and controlled to a degree that will not result in unreasonable degradation of groundwater. For this reason, they have been conditionally exempted from Title 27. Treatment and storage facilities for sludge that are part of the WWTF are considered exempt from Title 27 under section 20090(a), provided that the facilities not result in a violation of any water quality objective. However, residual sludge (for the purposes of the proposed Order, sludge that will not be subjected to further treatment by the WWTF) is not exempt from Title 27. Solid waste (e.g., grit and screenings) that results from treatment of domestic sewage and industrial waste also is not exempt from Title 27. This residual sludge and solid waste are subject to the provisions of Title 27.

Accordingly, the municipal discharge of effluent and the operation of treatment or storage facilities associated with a municipal wastewater treatment plant can be allowed without requiring compliance with Title 27 because the resulting degradation of groundwater will be in accordance with the Basin Plan.

CEQA

North of River Sanitary District No. 1 adopted a Negative Declaration (SCH # 1989091801) on 18 October 1989 for the expansion of a regional WWTF to an ultimate capacity of 12 mgd. The CEQA document did not address impact on groundwater from the project. However, this Order includes effluent limits for salinity, BOD, TSS, and nitrogen, and groundwater limitations for nitrate, EC, and other constituents with MCLs, taste and odor producing, and toxicity constituents. Compliance with these limits will mitigate any significant impacts to water quality.

Proposed Order Terms and Conditions

Discharge Prohibitions, Specifications and Provisions

The proposed Order prohibits discharge to surface waters and water drainage courses and cross connection between potable water and well water piping with recycled water piping.

The proposed Order would set a monthly average daily flow limit of 7.5 mgd, with effluent limits for BOD₅ and TSS of 40 mg/L monthly average and 80 mg/L daily maximum. These limitations are based on Basin Plan minimum performance standards for municipal facilities.

The provisions regarding pond dissolved oxygen, pH, and freeboard are consistent with Central Valley Water Board policy for the prevention of nuisance conditions, and are applied to all such facilities.

The proposed Order would prescribe groundwater limitations that implement water quality objectives for groundwater from the Basin Plan. The limitations require that the discharge not cause or contribute to exceedances of these objectives or natural background water quality, whichever is greater.

The proposed Order includes Provisions that would require the Discharger to evaluate the existing groundwater monitoring network and propose the installation of an adequate groundwater monitoring network. The Order would also provide a time schedule for the Discharger to submit an updated Title 22 Engineering Report, a Sludge Management Plan, an Industrial Pretreatment Program, an installation report for the mechanical dewatering facilities, a Nutrient Management Plan, and a detailed land use study report.

Monitoring Requirements

The proposed Order includes influent and effluent monitoring requirements, pond monitoring, groundwater monitoring, source water monitoring, sludge monitoring, and Reclamation Area monitoring. This monitoring is necessary to characterize the discharge, evaluate compliance with effluent limitations prescribed by the Order, and evaluate groundwater quality and the extent of the degradation caused by the discharge.

The Discharger must monitor groundwater for waste constituents expected to be present in the discharge, and capable of reaching groundwater and violating groundwater limitations if its treatment, control, and environmental attenuation, proves inadequate. For each constituent of concern, the Discharger must, as part of each monitoring event, compare concentrations of constituents found in each monitoring well (or similar type of groundwater monitoring device) to the background concentration or to prescribed numerical limitations to determine compliance.

Reopener

The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. It may be appropriate to reopen the Order if applicable laws and regulations change.

DMS/DKP: 6/09/2009

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
FOR
WASTE DISCHARGE REQUIREMENTS

1 March 1991

A. General Provisions:

1. The requirements prescribed herein do not authorize the commission of any act causing injury to the property of another, or protect the discharger from liabilities under federal, state, or local laws. This Order does not convey any property rights or exclusive privileges.
2. The provisions of this Order are severable. If any provision of this Order is held invalid, the remainder of this Order shall not be affected.
3. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:
 - a. Violation of any term or condition contained in this order;
 - b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts.
 - c. A change in any condition that results in either a temporary or permanent need to reduce or eliminate the authorized discharge;
 - d. A material change in the character, location, or volume of discharge.
4. Before making a material change in the character, location, or volume of discharge, the discharger shall file a new Report of Waste Discharge with the Central Valley Regional Water Quality Control Board (hereafter Central Valley Water Board). A material change includes, but is not limited to, the following:
 - a. An increase in area or depth to be used for solid waste disposal beyond that specified in waste discharge requirements.
 - b. A significant change in disposal method, location or volume, e.g., change from land disposal to land treatment.
 - c. The addition of a major industrial, municipal or domestic waste discharge facility.
 - d. The addition of a major industrial waste discharge to a discharge of essentially domestic sewage, or the addition of a new process or product by an industrial facility resulting in a change in the character of the waste.
5. Except for material determined to be confidential in accordance with California law and regulations, all reports prepared in accordance with terms of this Order shall be available for

public inspection at the offices of the Central Valley Water Board. Data on waste discharges, water quality, geology, and hydrogeology shall not be considered confidential.

6. The discharger shall take all reasonable steps to minimize any adverse impact to the waters of the state resulting from noncompliance with this Order. Such steps shall include accelerated or additional monitoring as necessary to determine the nature and impact of the noncompliance.
7. The discharger shall maintain in good working order and operate as efficiently as possible any facility, control system, or monitoring device installed to achieve compliance with the waste discharge requirements.
8. The discharger shall permit representatives of the Central Valley Water Board and the State Water Resources Control Board, upon presentation of credentials, to:
 - a. Enter premises where wastes are treated, stored, or disposed of and facilities in which any records are kept,
 - b. Copy any records required to be kept under terms and conditions of this Order,
 - c. Inspect at reasonable hours, monitoring equipment required by this Order, and
 - d. Sample, photograph, and videotape any discharge, waste, waste management unit or monitoring device.
9. For any electrically operated equipment at the site, the failure of which could cause loss of control or containment of waste materials, or violation of this Order, the discharger shall employ safeguards to prevent loss of control over wastes. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means.
10. The fact that it would have been necessary to halt or reduce the permitted activity in Order to maintain compliance with this Order shall not be a defense for the discharger's violations of the Order.
11. Neither the treatment nor the discharge shall create a condition of nuisance or pollution as defined by the California Water Code, Section 13050.
12. The discharge shall remain within the designated disposal area at all times.

B. General Reporting Requirements:

1. In the event the discharger does not comply or will be unable to comply with any prohibition or limitation of this Order for any reason, the discharger shall notify the Central Valley Water Board by telephone at (559) 445-5116 as soon as it or its agents have knowledge of such noncompliance or potential for noncompliance, and shall confirm this notification in writing within two weeks. The written notification shall state the nature, time and cause of

noncompliance, and shall describe the measures being taken to prevent recurrences and shall include a timetable for corrective actions.

2. The discharger shall have a plan for preventing and controlling accidental discharges, and for minimizing the effect of such events.

This plan shall:

- a. Identify the possible sources of accidental loss or leakage of wastes from each waste management, treatment, or disposal facility.
- b. Evaluate the effectiveness of present waste management/treatment units and operational procedures, and identify needed changes or contingency plans.
- c. Predict the effectiveness of the proposed changes in waste management/treatment facilities and procedures and provide an implementation schedule containing interim and final dates when changes will be implemented.

The Central Valley Water Board, after review of the plan, may establish conditions that it deems necessary to control leakages and minimize their effects.

3. All reports shall be signed by persons identified below:

- a. For a corporation: by a principal executive officer of at least the level of senior vice-president.
- b. For a Partnership or sole proprietorship: by a general partner or the proprietor.
- c. For a municipality state, federal or other public agency: by either a principal executive officer or ranking elected or appointed official.
- d. A duly authorized representative of a person designated in 3a, 3b or 3c of this requirement if;
 - (1) the authorization is made in writing by a person described in 3a, 3b, or 3c of this provision;
 - (2) the authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a waste management unit, superintendent, or position of equivalent responsibility. (A duly authorized representative may thus be either a named individual or any individual occupying a named Position); and
 - (3) the written authorization is submitted to the Central Valley Water Board.

Any person signing a document under this Section shall make the following certification:

STANDARD PROVISIONS AND REPORTING REQUIREMENTS
WASTE DISCHARGE TO LAND

-4-

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment."

4. Technical and monitoring reports specified in this Order are requested pursuant to Section 13267 of the Water Code. Failing to furnish the reports by the specified deadlines and falsifying information in the reports, are misdemeanors that may result in assessment of civil liabilities against the discharger.
5. The discharger shall mail a copy of each monitoring report and any other reports required by this Order to:

California Regional Water Quality Control Board
Central Valley Region
1685 E Street
Fresno, CA 93706-2020

or the current address if the office relocates.

C. Provisions for Monitoring

1. All analyses shall be made in accordance with the latest edition of: (1) "Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater" (EPA 600 Series) and (2) "Test Methods for Evaluating Solid Waste" (SW 846-latest edition). The test method may be modified subject to application and approval of alternate test procedures under the Code of Federal Regulations (40 CFR 136).
2. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. In the event a certified laboratory is not available to the discharger, analyses performed by a non certified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by Board staff. The Quality Assurance-Quality Control Program must conform to EPA guidelines or to procedures approved by the Central Valley Water Board

Unless otherwise specified, all metals shall be reported as Total Metals.

3. The discharger shall retain records of all monitoring information, including all calibration and maintenance records, all original strip chart recordings of continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period may be

extended during the course of any unresolved litigation regarding this discharge or when requested by the Central Valley Water Board Executive Officer.

Record of monitoring information shall include:

- a. the date, exact place, and time of sampling or measurements,
 - b. the individual(s) who performed the sampling of measurements,
 - c. the date(s) analyses were performed,
 - d. the individual(s) who performed the analyses,
 - e. the laboratory which performed the analysis,
 - f. the analytical techniques or methods used, and
 - g. the results of such analyses.
4. All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated at least yearly to ensure their continued accuracy.
 5. The discharger shall maintain a written sampling program sufficient to assure compliance with the terms of this Order. Anyone performing sampling on behalf of the discharger shall be familiar with the sampling plan.
 6. The discharger shall construct all monitoring wells to meet or exceed the standards stated in the State Department of Water Resources Bulletin 74-81 and subsequent revisions, and shall comply with the reporting provisions for wells required by Water Code Sections 13750 through 13755.22.

D. (This Section Not Applicable)

E. Conditions Applicable to Discharge Facilities Exempted From Chapter 15 Under Section 2511

1. If the discharger's wastewater treatment plant is publicly owned or regulated by the Public Utilities Commission, it shall be supervised and operated by persons possessing certificates of appropriate grade according to California Code of Regulations, Title 23, Division 4, Chapter 14.
2. By-pass (the intentional diversion of waste streams from any portion of a treatment facility, except diversions designed to meet variable effluent limits) is prohibited. The Board may take enforcement action against the discharger for by-pass unless:
 - a. (1) By-pass was unavoidable to prevent loss of life, personal injury, or severe property damage. (Severe property damage means substantial physical damage to

property, damage to the treatment facilities that causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a by-pass. Severe property damage does not mean economic loss caused by delays in production); and

- (2) There were no feasible alternatives to by-pass, such as the use of auxiliary treatment facilities or retention of untreated waste. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a by-pass that would otherwise occur during normal periods of equipment downtime or preventive maintenance; or
- b. (1) By-pass is required for essential maintenance to assure efficient operation; and
- (2) Neither effluent nor receiving water limitations are exceeded; and
- (3) the discharger notifies the Central Valley Water Board ten days in advance.

The permittee shall submit notice of an unanticipated by-pass as required in paragraph B.1. above.

3. A discharger that wishes to establish the affirmative defense of an upset (see definition in E.6 below) in an action brought for noncompliance shall demonstrate, through properly signed contemporaneous operating logs, or other evidence, that:
 - a. an upset occurred and the cause(s) can be identified;
 - b. the permitted facility was being properly operated at the time of the upset;
 - c. the discharger submitted notice of the upset as required in paragraph B.1., above; and
 - d. the discharger complied with any remedial measures required by waste discharge requirements.

In any enforcement proceeding, the discharger seeking to establish the occurrence of an upset has the burden of proof.

4. A discharger whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment, collection, and disposal facilities. The projections shall be made in January, based on the last three years' average dry weather flows, peak wet weather flows and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years, the discharger shall notify the Central Valley Water Board by **31 January**.
5. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to disposal. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.

6. Definitions

- a. Upset means an exceptional incident in which there is unintentional and temporary noncompliance with effluent limitations because of factors beyond the reasonable control of the discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper action.
- b. The monthly average discharge is the total discharge by volume during a calendar month divided by the number of days in the month that the facility was discharging. This number is to be reported in gallons per day or million gallons per day.

Where less than daily sampling is required by this Order, the monthly average shall be determined by the summation of all the measured discharges by the number of days during the month when the measurements were made.

- c. The monthly average concentration is the arithmetic mean of measurements made during the month.
- d. The "daily maximum" discharge is the total discharge by volume during any day.
- e. The "daily maximum" concentration is the highest measurement made on any single discrete sample or composite sample.
- f. A "grab" sample is any sample collected in less than 15 minutes.
- g. Unless otherwise specified, a composite sample is a combination of individual samples collected over the specified sampling period;
 - (1) at equal time intervals, with a maximum interval of one hour
 - (2) at varying time intervals (average interval one hour or less) so that each sample represents an equal portion of the cumulative flow.

The duration of the sampling period shall be specified in the Monitoring and Reporting Program. The method of compositing shall be reported with the results.

7. Annual Pretreatment Report Requirements:

(Applies to dischargers required to have a Pretreatment Program as stated in waste discharge requirements.)

The annual report shall be submitted by **28 February** and include, but not be limited to, the following items:

- a. A summary of analytical results from representative, flow-proportioned, 24-hour composite sampling of the influent and effluent for those pollutants EPA has identified

under Section 307(a) of the Clean Water Act which are known or suspected to be discharged by industrial users.

The discharger is not required to sample and analyze for asbestos until EPA promulgates an applicable analytical technique under 40 CFR (Code of Federal Regulations) Part 136. Sludge shall be sampled during the same 24-hour period and analyzed for the same pollutants as the influent and effluent sampling and analysis. The sludge analyzed shall be a composite sample of a minimum of 12 discrete samples taken at equal time intervals over the 24-hour period. Wastewater and alpine Sampling and analysis shall be performed at least annually. The discharger shall also provide any influent, effluent or sludge monitoring data for nonpriority pollutants which may be causing or contributing to Interference, Pass Through or adversely impacting sludge quality. Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 CFR Part 136 and amendments thereto.

- b. A discussion of Upset, Interference, or Pass Through incidents, if any, at the treatment plant which the discharger knows or suspects were caused by industrial users of the system. The discussion shall include the reasons why the incidents occurred, the corrective actions taken and, if known, the name and address of the industrial user(s) responsible. The discussion shall also include a review of the applicable pollutant limitations to determine whether any additional limitations, or changes to existing requirements, may be necessary to prevent Pass Through, Interference, or noncompliance with sludge disposal requirements.
- c. The cumulative number of industrial users that the discharger has notified regarding Baseline Monitoring Reports and the cumulative number of industrial user responses.
- d. An updated list of the discharger's industrial users including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The discharger shall provide a brief explanation for each deletion. The list shall identify the industrial users subject to federal categorical standards by specifying which set(s) of standards are applicable. The list shall indicate which categorical industries, or specific pollutants from each industry, are subject to local limitations that are more stringent than the federal categorical standards. The discharger shall also list the noncategorical industrial users that are subject only to local discharge limitations. The discharger shall characterize the compliance status through the year of record of each industrial user by employing the following descriptions:
 - (1) Complied with baseline monitoring report requirements (where applicable)
 - (2) Consistently achieved compliance;
 - (3) Inconsistently achieved compliance;
 - (4) Significantly violated applicable pretreatment requirements as defined by 40 CFR 403.8(f)(2)(vii);

- (5) Complied with schedule to achieve compliance (include the date final compliance is required);
- (6) Did not achieve compliance and not on a compliance schedule;
- (7) Compliance status unknown.

A report describing the compliance status of any industrial user characterized by the descriptions in items (d)(3) through (d)(7) above shall be **submitted quarterly from the annual report date** to EPA and the Central Valley Water Board. The report shall identify the specific compliance status of each such industrial user. This quarterly reporting requirement shall commence upon issuance of this Order.

- e. A summary of the inspection and sampling activities conducted by the discharger during the past year to gather information and data regarding the industrial users. The summary shall include but not be limited to, a tabulation of categories of dischargers that were inspected and sampled; how many and how often; and incidents of noncompliance detected.
- f. A summary of the compliance and enforcement activities during the past year. The summary shall include the names and addresses of the industrial users affected by the following actions:
 - (1) Warning letters or notices of violation regarding the industrial user's apparent noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the apparent violation concerned the federal categorical standards or local discharge limitations;
 - (2) Administrative Orders regarding the industrial user's noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations;
 - (3) Civil actions regarding the industrial user's noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations;
 - (4) Criminal actions regarding the industrial user's noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.
 - (5) Assessment of monetary penalties. For each industrial user identify the amount of the penalties;
 - (6) Restriction of flow to the treatment plant; or

- (7) Disconnection from discharge to the treatment plant.
- g. A description of any significant changes in operating the pretreatment program which differ from the discharger's approved Pretreatment Program, including, but not limited to, changes concerning: the program's administrative structure; local industrial discharge limitations; monitoring program or monitoring frequencies; legal authority or enforcement policy; funding mechanisms; resource requirements; and staffing levels.
- h. A summary of the annual pretreatment budget, including the cost of pretreatment program functions and equipment purchases.
- i. A summary of public participation activities to involve and inform the public.
- j. A description of any changes in sludge disposal methods and a discussion of any concerns not described elsewhere in the report.

Duplicate signed copies of these reports shall be submitted to the Central Valley Water Board and:

Regional Administrator
U.S. Environmental Protection Agency W-5
75 Hawthorne Street
San Francisco, CA 94105

And

State Water Resources Control Board
Division of Water Quality
Regulatory Unit
P.O. Box 944213
Sacramento, CA 94244-2130

Revised December 1995 to update signatory requirements (B.3.c).
Revised March 1997 to delete Section D, and update C.1

#

Appendix C

Effluent Disposal Water Balance

**North of River Sanitary District No.1
2017 Water/Nitrogen Balance**

DESIGN DATA			
Design Parameters			
Average Daily Flow, MGD	5.44		
Irrigation Efficiency, %	65%		
(Typical surface systems irrigation efficiencies are between 65-85% efficiency.)			
Effluent Storage Area in use, Acres			
Fznd	Surface Area (ac)	Depth (ft)	Volume (AF)
1	32.5	13	382
2	30.7	13	362
3	32.5	13	382
4	30.7	13	362
Total	126		1488
Required Additional Reclamation Area, Acres			
Required Additional Storage Area, Acres	0		
Nitrogen Concentration in Effluent, mg/TKN	38.6		
Denitrification in Soils,	10%		
Approximate Percolation Rate Pond #1 (ft/day)	0.09		
Approximate Percolation Rate Pond #2-4 (ft/day)	0.09		

SUMMARY	
Percentage of Effluent Reclaimed	74.01%
Percent of Nitrogen Reclaimed	75.46%

(0.00 Acre-feet at 13.0 feet deep)

Average

Calculated based on actual field conditions

Calculated based on actual field conditions

Month	ADF (MGD)	Storage Pond 1			Storage Pond 2			Storage Pond 3			Cumulative Pond 3 (Acre-ft)
		Percolation ⁽¹⁾ (Acre-feet)	Evaporation (Acre-ft)	Metered Flow to Irrigation (Acre-ft)	Percolation ⁽¹⁾ (Acre-feet)	Evaporation (Acre-ft)	Metered Flow to Irrigation (Acre-ft)	Percolation ⁽¹⁾ (Acre-feet)	Evaporation (Acre-ft)	Metered Flow to Irrigation (Acre-ft)	
January	5.30	4.58	3.1	268.0	89.7	382.0	4.55	3.1	0.0	89.7	0.0
February	5.26	4.09	6.9	355.0	81.0	382.0	4.09	2.2	0.0	60.8	53.7
March	5.29	0.95	13.5	251.0	89.7	382.0	0.95	13.5	0.0	89.7	40.4
April	5.24	1.03	17.5	373.0	86.8	382.0	1.03	0.4	0.0	47.8	0.0
May	5.34	0.19	20.9	360.0	89.7	382.0	0.19	0.4	0.0	30.3	0.0
June	5.39	0.00	23.2	550.0	86.8	196.2	0.00	0.1	0.0	0.0	0.0
July	5.43	0.00	23.2	446.0	89.7	135.0	0.00	0.1	0.0	0.0	0.0
August	5.66	0.00	21.5	414.0	89.7	106.4	0.00	0.0	0.0	0.0	0.0
September	5.68	0.05	11.3	374.0	89.7	382.0	0.05	0.0	0.0	0.0	0.0
October	5.66	0.05	11.3	607.0	89.7	116.0	0.05	2.6	0.0	0.0	0.0
November	5.49	0.19	6.3	107.0	86.8	292.5	0.19	0.0	0.0	0.0	0.0
December	5.46	0.11	4.5	206.0	89.7	382.0	0.11	4.3	0.0	89.7	0.0
Average	5.44	11.8	168.4	4,168.0	1,055.8		11.8	27.3	0.0	407.8	
Total	6,090.0										

¹Precipitation corresponds to the water contribution by rainfall over the areas covered by the treatment area and storage ponds by the year's monthly precipitation data.

²Percolation is an assumed number that when added to the evaporation number corresponds to the difference in annual influent and effluent volumes provided by the District.

³Storage Pond 2 and 4 received no effluent in 2017

⁴Monthly excess (deficit) of water equals to the sum of sewage flow and precipitation less the water loss through evaporation, percolation and reclamation.

⁵Assume one foot of effluent always remains in Storage Pond No. 1. Outlet pipe to reclaimed water pump station approximately one foot from pond bottom.

**North of River Sanitary District No.1
2017 Water/Nitrogen Balance**

Month	Applied from Effluent			Applied from Fertilizer			Nitrogen Balance ⁽⁶⁾			Percentage Reclaimed #DIV/0!
	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	(Tons)	Deficit/(Excess) (Tons)	Uptake (Tons)		
January	0.00	9.76	0.00	0.00	3.84	0.00	0.00	(5.91)	39%	
February	0.00	35.82	0.00	0.00	16.90	0.00	(18.92)	(18.92)	47%	
March	0.00	7.53	0.00	0.00	21.19	0.00	13.66	13.66	100%	
April	0.00	17.41	0.00	0.00	27.97	0.00	10.56	10.56	100%	
May	0.00	29.95	0.00	0.00	33.75	0.00	3.80	3.80	100%	
June	0.00	14.21	0.00	0.00	18.55	0.00	4.34	4.34	100%	
July	0.00	19.93	0.00	0.00	12.31	0.00	(7.62)	(7.62)	39%	
August	0.00	22.01	0.00	0.00	8.79	0.00	(13.22)	(13.22)	62%	
September	0.00	25.88	0.00	0.00	4.99	0.00	(20.89)	(20.89)	20%	
October	0.00	21.00	0.00	0.00	159.23	0.00	-51.77	-51.77	19%	
November	0.00	422.008.42	0.00	0.00	318.463.57	0.00	-103.544.84	-103.544.84	75%	
December	0.00		0.00	0.00		0.00				
Total (lbs)										

Hydraulic Balance Cont'd

Month	Storage Pond 4				Storage Pond 2						
	Flow to Pond 4 (Acre-ft) ⁽³⁾	Precipitation ⁽¹⁾ (Acre-feet)	Evaporation (Acre-ft)	Metered Flow to Irrigation (Acre-ft)	Flow to Pond 2 (Acre-ft) ⁽³⁾	Precipitation ⁽¹⁾ (Acre-feet)	Evaporation (Acre-ft)	Metered Flow to Irrigation (Acre-ft)	Percolation (Acre-ft) ⁽²⁾	Cumulative Pond 2 (Acre-ft)	Flow to future pond (Acre-ft)
January	0.0	4.32	0.97	0.0	0.0	4.32	0.97	0.0	0.0	0.0	0.0
February	0.0	3.86	2.10	0.0	0.0	3.86	2.10	0.0	0.0	0.0	0.0
March	0.0	0.90	0.51	0.0	0.0	0.90	0.51	0.0	0.0	0.0	0.0
April	0.0	0.97	0.33	0.0	0.0	0.97	0.33	0.0	0.0	0.0	0.0
May	0.0	0.18	0.36	0.0	0.0	0.18	0.36	0.0	0.0	0.0	0.0
June	0.0	0.00	0.05	0.0	0.0	0.00	0.05	0.0	0.0	0.0	0.0
July	0.0	0.00	0.05	0.0	0.0	0.00	0.05	0.0	0.0	0.0	0.0
August	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0
September	0.0	0.00	0.00	0.0	0.0	0.00	0.00	0.0	0.0	0.0	0.0
October	0.0	0.03	2.48	0.0	0.0	0.03	2.48	0.0	0.0	0.0	0.0
November	0.0	0.18	0.67	0.0	0.0	0.18	0.67	0.0	0.0	0.0	0.0
December	0.0	0.10	1.51	0.0	0.0	0.10	1.51	0.0	0.0	0.0	0.0
Total	0.0	11.2	9.1	0.0	0.0	11.2	9.1	0.0	0.0	0.0	0.0

¹Precipitation corresponds to the water contribution by rainfall over the areas covered by the treatment area and storage ponds by the year's monthly precipitation data.

²Percolation is an assumed number that when added to the evaporation number corresponds to the difference in annual influent and effluent volumes provided by the District.

³Storage Pond 2 and 4 received no effluent in 2016

⁴Monthly excess (deficit) of water equals to the sum of sewage flow and precipitation less the water loss through evaporation, percolation and reclamation.

⁵Assume one foot of effluent always remains in Storage Pond No. 1. Outlet pipe to reclaimed water pump station approximately one foot from pond bottom.

Appendix D

Parallel Trunk Sewer Cost Opinion

APPENDIX D
PARALLEL TRUNK SEWER CAPITAL COST OPINION
(2018 DOLLARS)

	Sewers				Manholes			Road Crossings			Paving			TOTAL COSTS (M\$)
	Diameter (inches)	length (feet)	Cost (\$/Foot)	Pipe Cost (M\$)	No.	Cost per Each (\$)	Manhole Cost (M\$)	No.	Cost (\$/Foot)	Cost (M\$)	Area (SF)	Cost (M\$)	Utility Relocations (\$M)	
Beginning (East of Highway 99) to Victor St at Norris Rd	33	4,612	300	1.4	10	29,000	0.3	3	1400	0.4	138,360	0.8	0.1	3.0
Norris Rd--Victoria to Fruitvale	33	3,981	300	1.2	9	29,000	0.3	3	1400	0.4	119,430	0.7	0.1	2.7
Norris Rd--Fruitvale to Coffee	33	5,202	300	1.6	11	29,000	0.3	3	1400	0.4	156,060	0.9	0.1	3.3
Norris Rd--Coffee to Verdugo	36	8,046	350	2.8	18	29,000	0.5	4	1500	1.5	241,380	1.4	0.1	6.3
Norris Rd--Verdugo to Jewetta	36	2,733	350	1.0	6	29,000	0.2	2	1500	0.3	81,990	0.5	0.5	2.4
Norris Rd--Jewetta to Allen	36	4,694	350	1.6	8	29,000	0.2	3	1500	0.5	140,820	0.8	0.1	3.2
Norris Rd--Allen to Renfro	36	5,645	350	2.0	12	29,000	0.3	4	1500	0.6	169,350	1.0	0.1	4.0
Norris Rd--Renfro to Santa Fe Way	42	2,443	460	1.1	6	29,000	0.2	2	1900	0.4	73,290	0.4	0.1	2.2
Santa Fe Way--Norris to 7th Standard	48	11,033	600	6.6	24	42,000	1.0	8	2100	1.7	330,990	1.9	0.1	11.3
7th Standard Rd--Santa Fe to Superior	54	11,618	740	8.6	27	50,000	1.4	6	1300	0.8	348,540	2.0	0.1	12.8
7th Standard Rd--Superior to Beech	54	7,429	740	5.5	11	50,000	0.6	2	1300	0.3	222,870	1.3	0.1	7.7
7th Standard Rd--Beech to Shafter Ave	54	4,675	740	3.5	11	50,000	0.6	2	1300	0.3	140,250	0.8	0.1	5.2
7th Standard--Shafter Ave to WWTP	54	20,675	740	15.3	5	50,000	0.3	2	1300	0.3	620,250	3.6	0.1	19.5
		92,786												
Construction Cost (January 2018)														16.0
Engineering and Contingencies (35%)														5.6
January 2018 Total Construction Cost														21.6

NOTE: 1.5M\$ "Road Crossing" cost includes crossings under Friant-Kern Canal and Calloway Canal.

Appendix E

Interceptor Sewer Cost Opinion

**APPENDIX E
INTERCEPTOR SEWER CAPITAL COST OPINIONS
(2018 DOLLARS)**

	Sewers				Manholes			Road Crossings			Paving			INTERCEPTOR LIFT STNS.		TOTAL COSTS (M\$)
	Diameter (inches)	length (feet)	Cost (\$/Foot)	Pipe Cost (M\$)	No.	Cost per Each (\$)	Manhole Cost (M\$)	No.	Cost (\$/Foot)	Cost (M\$)	Area (SF)	Cost (M\$)	Utility Relocations (\$M)	Number	Cost (M\$)	
Beech Avenue--Imperial to Rosedale Hwy	24	15,900	208	3.3	32	29,000	0.9	3	1,300	0.4	477,000	2.7	0.3	2	4.6	18.1
	27	5,300	243	1.3	12	29,000	0.3	2	1,300	0.3	159,000	0.9	0.1			
	30	5,300	267	1.4	6	29,000	0.2	2	1,300	0.3	159,000	0.9	0.1			
Superior Road--Imperial to Rosedale Hwy	24	15,900	208	3.3	16	29,000	0.5	6	1,300	0.8	477,000	2.7	0.3	2	4.6	17.9
	27	5,300	243	1.3	6	29,000	0.2	2	1,300	0.3	159,000	0.9	0.1			
	30	5,300	267	1.4	6	29,000	0.2	2	1,300	0.3	159,000	0.9	0.1			
Greeley Road--Imperial to Rosedale Hwy	24	15,900	208	3.3	16	29,000	0.5	6	1,300	0.8	477,000	2.7	0.3	2	4.6	17.9
	27	5,300	243	1.3	6	29,000	0.2	2	1,300	0.3	159,000	0.9	0.1			
	30	5,300	267	1.4	6	29,000	0.2	2	1,300	0.3	159,000	0.9	0.1			
Nord-7th Standard to Hageman	24	8,000	208	1.7	16	29,000	0.5	3	1,300	0.4	240,000	1.4	0.2	1	2.3	12.3
	27	5,300	243	1.3	12	29,000	0.3	2	1,300	0.3	159,000	0.9	0.1			
	30	5,300	267	1.4	12	29,000	0.3	2	1,300	0.3	159,000	0.9	0.1			
Heath Road--7th Standard to Meacham	24	18,600	208	3.9	36	29,000	1.0	7	1,300	0.9	558,000	3.2	0.4	1	2.3	9.4
	24	15,900	208	3.3	32	29,000	0.9	6	1,300	0.8	477,000	2.7	0.3	0	0.0	8.1
	24	10,600	208	2.2	22	29,000	0.6	4	1,300	0.5	318,000	1.8	0.2	0	0.0	5.4
Allen Road--7th Standard to Olive	24	8,000	208	1.7	16	29,000	0.5	3	1,300	0.4	240,000	1.4	0.2	1	2.3	10.8
	27	5,300	243	1.3	12	29,000	0.3	2	1,300	0.3	159,000	0.9	0.1			
	30	2,700	267	0.7	6	29,000	0.2	1	1,300	0.1	81,000	0.5	0.1			
Calloway Drive--7th Std Rd. to Norris	24	5,300	208	1.1	12	29,000	0.3	2	1,300	0.3	159,000	0.9	0.1	0	0.0	10.7
	27	8,000	243	1.9	16	29,000	0.5	3	1,300	0.4	240,000	1.4	0.2			
	24	13,300	267	3.6	27	29,000	0.8	7	1,300	0.9	399,000	2.3	0.3	0	0.0	7.8
		185,800														
Construction Cost (January 2018)																
				42.0			9.4								20.7	117.2
Engineering and Contingencies (35%)																
				14.7			3.3								7.2	41.0
January 2018 Total Construction Cost																
				56.8			12.7								27.9	158.3

