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DISTRICT MANAGEMENT

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July 25, 2008

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

Attention: W. Dale Harvey, P.E., Senior Engineer

Subject: Malaga County Water District (MCWD)
Order No. R5-2008-0033, NPDES No. CA 0084239
Treatment and Disposal Capacity Study

Dear Mr. Harvey:

As required, please find attached an evaluation of the Treatment and Disposal Capacity of the facilities as required by Section 3.a. of the Cease and Desist Order.

Please contact me if you have any questions or if you require additional information.

Sincerely,

Michael G. Taylor, P.E.

MGT

Enclosure

cc: Malaga County Water District, Russ Holcomb, General Manager
Fresno Irrigation District (FID), Lawrence Kimura
2008 MCWD – RWQCB Correspondence File

Tech Rpts copy

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MALAGA COUNTY WATER DISTRICT

Study Evaluating Treatment And Disposal Facilities

July 2008

Prepared for:

RWQCB

Prepared by:

Provost & Pritchard Engineering Group, Inc.
Fresno, California

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1 FLOWRATE AND CHARACTERISTICS

1.1 Existing Flowrate and Characteristics

A. The present flowrate received at the wastewater facilities is summarized in Table 1. It is noted that the facilities periodically receive high flows. For example, the District received average monthly flows in excess of 0.9 mgd from July through September of 2005 and from June through September in 2007. The District has received high flows again in the summer of 2008. The source of those flows is not yet determined, although they may due in part to high source water electroconductivity and the resulting impact to boiler blowdown generation from the industrial connections.

B. It is noted that the flowrates reported include a recirculation flowrate estimated to be between 100,000 and 200,000 gpd from the grit wash tank. Existing influent characteristics are typically approximately 200 mg/l BOD_5 and approximately 200 mg/l TSS as reported to the RWQCB. It is noted that the influent characteristics are sampled when the grit wash recirculation is active. The impact of this recirculated flowrate to the characteristics is not known. Future samples will be obtained without the influence of the recircululated flows.

1.2 Future Flowrate and Characteristics

A. The Waste Discharge Requirements are intended to be applied to a facility receiving up to 1.2 mgd. The existing average monthly flowrate received by the facilities ranged from 0.746 mgd to 1.020 mgd in 2007. Land use of property within the sphere of influence of the District, yet not connected to the sewer system is summarized in Table 2. Zoning within the sphere of Influence is shown in Figure 1.

B. Based on previous growth rates in the Malaga County Water District, an anticipated increase of sewage received at the treatment facilities is summarized in Table 3. The growth rate is based on the average monthly flowrate increase between 1990 and 2007 (0.011 mgd increase per year). The ultimate flowrate for the treatment plant is unknown due to the extreme range of flows that could be attributed to the industrial land uses in the District.

2 TREATMENT FACILITIES

2.1 Design Criteria

A. Design criteria for the wastewater treatment and disposal facilities are summarized on Plan Sheet 15 of 62 (1999) in the Appendix A.

B. Specific requirements that require compliance are as follows:

- Average monthly electroconductivity (Ec) 500 µmhos/cm greater than source water, or 1,000 µmhos/cm, whichever is more stringent.
- Chloride of 175 mg/l

C. Tertiary effluent

- BOD_5 of 10 mg/l
- TSS of 10/mg/l
- Ammonia Nitrogen of 1.3 mg/l (as N) until May 2010
- Ammonia Nitrogen of 0.4 mg/l (as N) after May 19, 2010
- Boron of non-detect
- Turbidity of 2 NTU
- Total Coliform of 2.2 MPN/100 ml as a 7 day median

2.2 Evaluation of Treatment Components

2.3 Headworks

A. The influent screw pumps have a capacity of 1,100 gpm each. The existing screw pumps have a capacity that is sufficient to meet existing and future demands. The existing screw pumps are in need of repair to the flights to maintain the pumping capacity.

B. The existing headworks includes a grit removal facility. There is a continuous recirculation of a portion of the wastewater that is not metered separately The MCWD is in the process of installing a new flowmeter to enable monitoring of the recirculated flow.

1. Short-Term measures: repair flights of screw pumps within 12 months. Construct grit chamber flow measurement within four 4 months.
2. Long-Term measures: maintain a fund for the purpose of maintaining and replacing the screw pumps as needed.

2.4 Barminutor

The barminutor has a capacity of 1.2 mgd. The barminutor is sufficient to meet anticipated demands through 2028. The barminutor is presently out of service for maintenance and is expected to be placed into operation in August 2008.

2.5 Dissolved Air Floatation (DAF) Clarifier

A. The existing DAF has been out of service for several years due to the discovery of leaks from the structure that resulted in the surfacing of untreated effluent. The entire interior surface of the DAF was recently re-coated and sealed. Leaks continue to come from the structure and are now limited to two (2) 12 inch diameter lines that feed the DAF and are located underneath the structure. The workplan to bring the DAF into service is as follows:

Task	Timeline
Video review of existing pipeline	June 2008
Physical confirmation of as-built Conditions and dimensions	July 2008
Initiate construction of improvements	October 2008
Complete construction, perform leak testing	December 2008
Return DAF to service	January 2008

B. The capacity of the DAF is estimated to be 1.2 mgd. A long term plan for expansion of the primary sedimentation facilities is to construct a second DAF as shown in Appendix B. Presently, the lack of the DAF has not compromised the ability of the facilities to meet Waste Discharge Requirements.

1. Short term measures: Repair/replace influent pipelines and place the DAF back into service by January 2009.
2. Long term measures: Construct a second DAF with a capacity of 1.65 at such time that the average influent flowrate reaches 1.10 mgd.

2.6 Activated Sludge

A. The capacity of the activated sludge tanks is 1.20 mgd. The activated sludge system is dependent upon the three existing blowers that supply 1,500 of cfm to the fine bubble diffuser system. The existing tank volume, detention time, and oxygen supply are sufficient to meet the new discharge requirements for BOD and TSS until the flowrate of 1.2 mgd is reached. A summary of the design criteria for the activated sludge units is contained in Appendix A. Performance of

the activated sludge facilities regarding ammonia is not yet verified. Monitoring of nitrogen forms within the effluent has recently been initiated. Enhancements that may be implemented at the activated sludge facilities may include:

1. Recirculation of RAS to the headworks,
2. Installation of fixed media beds within the existing activated sludge tanks, or
3. Creation of anoxic zones within the activated sludge tanks by restricting air flow in specific locations.

A workplan to investigate the activated sludge units is as follows:

Task	Timeline
Evaluate the existing units and air flow regarding nitrification and dentrification	July-August 2008
Recommend improvements or modifications to present operations (short-term and long-term)	September 2008
Implement short-term measures (if necessary)	December 2008

B. A long-term plan for expansion of the activated sludge units is to install two (2) additional blowers and construct one (1) additional activated sludge tank as shown in Appendix B.

1. Short-term measures: Complete the workplan to investigate the nitrification capabilities of the existing facilities. Implement recommendations of the short-term workplan by December 2008.
2. Long-term measures: Expand the activated sludge tank and associated blowers to a capacity of 1.65 mgd at such time the average monthly flowrate is 1.1 mgd.

2.7 Secondary Clarifiers

A. Although three (3) secondary clarifier tanks are located within the treatment facilities, only one (1) clarifier is in operation. The capacity of the clarifier is 823,000 gpd. The facilities lack redundancy and the ability to meet periodic high influent flowrates. The overall capacity of the three (3) secondary clarifiers is 1.65 mgd (one clarifier held in reserve for redundancy). The workplan to bring a second clarifier into service is as follows:

Task	Timeline
Determine availability and cost of clarifier drive mechanism, chain and flights	June-July 2008
Initiate contract to install necessary components in the second clarifier	September 2008
Review necessary structural repairs to the third clarifier tank – cold joint between structures	August-Sept. 2008
Initiate repairs to the third clarifier structure	April 2009
Construct mechanical components in third clarifier	June 2009

1. Short-term measures: Proceed with workplan as outlined above.
2. Long-term measures: TBD

2.8 Sludge Digestion

A. The existing sludge digesters have a capacity of 1.2 mgd. The operation of the sludge digesters is proceeding as required. No specific upgrades or improvements are needed at this time.

B. The sludge thickener is in need of repair to the chain and flight mechanism. The thickness is out of service at the present. District staff is proceeding with initiating the necessary purchase of replacement components.

1. Short-term measures: Repair sludge thickener by September 2008. Construct lining of the third sludge drying bed in 2009.
2. Long-term measures: TBD

2.9 Tertiary Filter

A. The existing teriary filter has a capacity of 0.45 mgd, which is equivalent to the existing permit for discharge. The Fresno Irrigation District (FID) has requested that the MCWD initiate actions to become independent of canal discharge. Therefore, immediate expansion of the Tertiary filter is not warranted. Previous evaluations recommended an expansion of the tertiary filtration system to at least 0.7 mgd to alleviate pressure from the disposal ponds.

B. The MCWD is presently designing an ultraviolet (UV) light disinfection system to replace the existing chlorination/dechlorination facilities and achieve more consistency in meeting the electroconductivity limits. The UV system will allow the facilities to meet the new requirements for bromoform, chlorodibromomethane, and dichlorobromomethane.

1. Short-term measures: Complete the improvements necessary to convert to UV disinfection.
2. Long-term measures: TBD

3 DISPOSAL FACILITIES

3.1 Background

A. Provost & Pritchard Engineering Group, Inc. was authorized by the Board of Directors to evaluate disposal pond expansion alternatives for wastewater treatment plant design flows of 1.2 MGD and 1.65 MGD (future), evaluate potential disposal sites and estimate capital costs associated with the additional disposal facilities.

B. Additional disposal capacity is of critical need to address both present flow rates and design capacity flows for the wastewater treatment plant. In addition the FID has notified the District of the need to become independent of the discharge to the Central Canal.

   The California Regional Water Quality Control Board (RWQCB) Cease and Desist Order issued March 14, 2008 requires a study evaluating the current disposal capacity and addressing additional short term and long term disposal capacity be submitted by District within 90 days of permit adoption.

C. The District will also evaluate reclamation of the treated effluent and reclamation of industrial effluent within the next 45 days. The wastewater treatment plant site has 23.24 acres of disposal ponds and no vacant property for additional ponds. Wastewater treatment plant data for 2007 was studied and determined that percolation rates remain at no greater than 0.6 inches per day. The 2007 study confirmed the percolation data previously reviewed in 2005. Calculations for the 2007 study can be found in Table 4. Decreasing percolation and increasing flow rates have caused pond freeboard to be chronically in violation of the WDR requirements over the last few years. Tertiary treatment and disposal to the Central Canal, was implemented in 2001 to relieve pond loading and allow for pond maintenance, however increased in flow rates to the wastewater treatment plant have offset the additional discharge capacity.

D. Due to periodic high flow rates pond maintenance to improve percolation has not been performed. It is anticipated that maintenance of the existing ponds would initially increase percolation to 1.0 inches per day. Regular pond maintenance would keep percolation rates at higher levels and remove solids and silt build up that cause reduced percolation rates.

E. Actions to enhance disposal capacity or to decrease flows at the treatment facilities are critical in the next 6 to 9 months.

3.2 Disposal Pond Requirements

A. Water balances have been prepared to evaluate the disposal requirements for the current wastewater treatment flowrates, design capacity of 1.2 MGD and the ultimate wastewater treatment capacity of 1.65 MGD. Average year and 100 year rainfall scenarios were evaluated for each flowrate in Tables 5 through 10.

The total pond required disposal pond capacity required was found to be:

Existing Acres	23.24 ac
0.8 MGD[1]	36.50 ac
1.2 MGD[2]	50.50 ac
1.65 MGD[3]	66.20 ac

1. Present Flows (approximate)
2. Current WWTP Design Capacity
3. Ultimate WWTP Design Capacity

B. To prepare conservative estimates of required disposal areas, it was assumed that at any given time 23.24 acres of ponds would have reduced percolation rates of 0.6 inches per day (ponds requiring maintenance) and the remaining ponds would have percolation rates of up to 1.0 inches per day (ponds recently maintained).

Additional acres of disposal ponds needed:

0.8 MGD - Present Flowrate	
Total Required	36.50 ac
Existing Disposal Ponds	23.24 ac
Additional Ponds Required	**13.26 ac**
1.2 MGD – Design Capacity	
Total Required	50.50 ac
Existing Disposal Ponds	23.24 ac
Additional Ponds Required	**27.26 ac**
1.65 MGD – Ultimate Capacity	
Total Required	66.20 ac
Existing Disposal Ponds	23.24 ac
Additional Ponds Required	**42.96 ac**

C. A water balance prepared to evaluate the pond acreage required to offset the 0.45 mgd discharge to the Central Canal, suggests that 15 acres of ponds would be required (See Table 11).

3.3 Disposal Alternatives

A. Six (6) potential disposals sites have been identified for the purposes of this preliminary report. All of the sites are south of the wastewater treatment plant near the intersection of Malaga Avenue and Maple Avenue. The area is primarily

agricultural with some single family residences on parcels that range in size from 1 to 18 acres.

B. Table 12 lists the parcel number, property owner, total parcel acreage and pond acreage that could be provided by each site.

The proposed disposal sites have been evaluated with consideration for the following factors:

1. Size and configuration of property
2. Distance from WWTP
3. Existing site conditions
4. Williamson Act –non-agricultural preserve

C. Additional factors considered when considering possible disposal sites are the relative locations of Highway 99, the Central Canal and the Southern Pacific Railroad tracks. Traffic volume at the intersection of Maple and Central and the, location of existing utilities, irrigation structures, and ditches also must be considered in evaluating potential disposal sites. A pump station and a transmission main would be required to convey treated wastewater to any disposal site.

D. Figure 2 shows the vicinity of the WWTP and the APN numbers of parcels in the area being considered for potential disposal sites. Only one parcel, APN 330 031 45S, is large enough to provide all required disposal capacity for the ultimate treatment plant design capacity of 1.65 MGD. Portions of that parcel or smaller parcels could be combined to provide required disposal capacity as flowrates to the wastewater treatment plant increase.

E. If property in the vicinity of Maple and Malaga Avenues is acquired, the treated effluent would require a transmission main along Maple Avenue or along an easement parallel to the railroad approximately ¼ mile west of Maple Avenue. A preliminary alignment of the transmission main is included in Figures 4,5 A, and 5B. It is noted that if the transmission main is to follow Maple Avenue, an easement with Parnegian may be required due to the various existing and proposed utilities in Maple Avenue and the high volume of truck traffic at Maple and Central Avenue.

F. The configuration of ponds on any site will be dependent on site conditions, size and location. Figure 3 is an example of a typical pond configuration on one of the potential sites.

G. A preliminary estimate of capital costs for disposal facilities located on APN 330 031 42S is included in Appendix C.

1. Short-term measures:

   Within 30 days:

   a. Conduct additional property research, contact property owners to identify potential willing sellers. Consider hiring a consultant to assist with property acquisition.

   b. Drain Pond No. 5 during the summer of 2008. Allow it to dry for 2-3 weeks then scrape the bottom and then deep rip the bottom.

   c. Consider a moratorium on any new connections or expansion of existing connections until disposal facilities are expanded.

   Within 60 days:

   a. Enter into negotiations for purchase or long term lease of a property for disposal ponds. Prepare environmental documents for the proposed project.

   b. Determine financial means to construct the project.

   c. Prepare a timeline for additional disposal capacity improvements.

2. Long-term measures:

   a. Acquire approximately 30 acres of additional property for the construction of percolation/evaporation ponds.

3.4 Reclamation Alternatives

A. In addition to reviewing alternatives of additional property for the purpose of percolation/evaporation ponds, there may be viable alternatives for reclamation within the District. Alternatives may include:

   1. Reclamation of treated effluent to Caltrans landscaping
   2. Reclamation of treated effluent for agricultural purposes

B. The MCWD has contacted Caltrans regarding a) the willingness of Caltrans to receive treated effluent, b) the potential volume of water that may be reclaimed, and c) the cost of the reclamation.

C. Discussions with Caltrans in November of 2007 indicated a willingness to receive the treated effluent in concept. Concerns expressed by Caltrans included the suitability of existing landscapes to the effluent, the need to construct a dual feed system in the event reclaimed water was not available, the ability of Caltrans to maintain the inspection system and landscaping, training of Caltrans personnel in handling treated effluent. Malaga CWD presently provides Caltrans with water for landscaping. Unfortunately, the total water used during the peak month of

2007 was only 7,230 gal/d. The alternative to irrigate Caltrans landscaping, therefore, is not viable to alleviate disposal restrictions.

D. Agricultural property in the vicinity of the wastewater treatment plant is presently irrigated by private wells and supplemented by FID. The present discharge by MCWD to the FID Central Canal provides approximately 1.3 acre-feet of water per day to the canal. Agricultural properties in the vicinity of the treatment plant are not willing to modify irrigation practices for the relatively small amount of irrigation water.

E. There exists, several large industries within Malaga County Water District east of State Route 99. These industries discharge industrial boiler blow down water in addition to other waste streams. There exists a potential to construct a separate satellite treatment facility for boiler blow down water that may be treated and disposed of (percolation/evaporation ponds) on the east side of State Route 99. The industrial sites for PPG and Rio Bravo are adjacent to each other. These two sites generate a significant amount of the boiler blowdown received by MCWD. The option of collecting those two waste steams, providing necessary secondary treatment and then disposal in compliance with new Waste Discharge Requirements of property to be obtained by the MCWD would be explored. The alternative reduces the amount of additional property required west of State Route 99.

1. Short-term measures:

    a. Contact Calpine and PPG regarding the wiliness to sell property to MCWD.

2. <u>Long-term measures</u>:

    a. Purchase property from PPG, Calpine, and/or ADM.

    b. Construct new disposal ponds

    c. Construct a satellite treatment plant

    d. Construct a separate collection system for boiler blowdown

F. There exists potential to separate the boiler blowdown water water as a separate waste stream, provide separate treatment facilities, and then reclaim the effluent for industrial or irrigation purposes.

G. Potential reclamation sources or disposal sites are shown on Figures 6-10. The sites are listed as follows:

Figure	Site
6	ADM and Calpine
7	Community Park Property
8	Konkel School Property
9	PPG Property
10	Rio Bravo Property

H. The reclamation sites offer the opportunity to reduce the influent flowrate to the treatment facilities by capturing the boiler blowdown water. If necessary, water from the District wells could be used to reduce the Ec of the reclaimed water to levels acceptable for landscape irrigation.

I. Each acre of lawn that could be irrigated may reduce the amount of sewage received at the treatment facilities by approximately 250 gal/d in an average rainfall year.

1. Short-term measures:

   a. Determine the suitability of a typical lawn to Ec levels of 800 µmhos/cm

   b. Contact the Department of Public Health regarding the potential of irrigation of tertiary effluent on private sites

   c. Contact PPG, Rio Bravo, ADM regarding the potential of irrigating or other reclamation with boiler blowdown water

   d. Contact representatives of the Konkel School regarding the potential or irrigation of lawn with boiler blowdown

2. Long-term measures:

   a. Obtain Reclamation Permits from the Department of Public Health for reclamation.

   b. Construct a separate collection system, treatment plant and distribution system for irrigation of boiler blowdown.

4 SUMMARY

4.1 Short Term

A. Immediate deficiencies at the treatment facilities are:

1. Influent flow measurement - complete
2. DAF Clarifier - complete
3. Secondary Clarifiers - one fixed - one has funding in place
4. Sludge Thickener - complete
5. UV Disinfection - complete

B. The MCWD has identified a plan to install grit recirculation flow measurement in 2008, return to DAF to service in 2008, install improvements to an additional secondary clarifier in 2008, and repair the chain and flight mechanism of the sludge thickener. The ultraviolet light disinfection system is also scheduled for construction in 2008.

C. The MCWD continues to pursue means to reduce electroconductvity within the influent flowrate through pretreatment requirements.

D. The facilities presently meet ammonia requirements however additional monitoring information is required prior to recommending additional improvements.

E. Disposal facilities are in critical need of expansion. Additional property acquisition and pond construction is critical.

F. A summary of the anticipated schedule for short term improvements is included as Figure 11.

4.2 Long Term

A. Master plan expansion of DAF and Activated Sludge Facilities are identified.

B. Future disposal alternatives are dependent upon the viability of reclamation proposal and the acquisition of additional disposal ponds.

TABLES

TABLE 1

MALAGA COUNTY WATER DISTRICT
WASTEWATER TREATMENT PLANT
MONITORING AND REPORTING PROGRAM NO. 2008-0033
NPDES NO. CA 0084239

YEAR	0.8 of Permit Flow	AVERAGE FLOWRATE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1990		0.677	0.660	0.667	0.694	0.610	0.688	0.709	0.652	0.664	0.679	0.726	0.741	0.632
1991		0.694	0.642	0.651	0.694	0.687	0.684	0.697	0.682	0.703	0.728	0.712	0.713	0.731
1992		0.735	0.727	0.741	0.735	0.681	0.679	0.740	0.753	0.768	0.743	0.768	0.756	0.729
1993		0.716	0.727	0.720	0.724	0.721	0.715	0.703	0.705	0.712	0.714	0.703	0.709	0.734
1994		0.724	0.748	0.739	0.743	0.743	0.745	0.740	0.739	0.737	0.731	0.722	0.669	0.636
1995		0.660	0.638	0.635	0.621	0.614	0.626	0.636	0.641	0.695	0.699	0.705	0.709	0.699
1996		0.688	0.671	0.680	0.676	0.690	0.690	0.689	0.692	0.691	0.686	0.694	0.696	0.705
1997	0.96	0.714	0.686	0.681	0.681	0.690	0.704	0.715	0.711	0.740	0.756	0.722	0.734	0.749
1998	0.96	0.745	0.744	0.743	0.737	0.772	0.755	0.756	0.738	0.775	0.740	0.739	0.706	0.738
1999	0.96	0.760	0.753	0.753	0.735	0.746	0.765	0.762	0.778	0.780	0.770	0.761	0.760	0.751
2000	0.96	0.772	0.723	0.744	0.738	0.754	0.783	0.767	0.772	0.808	0.770	0.795	0.797	0.810
2001	0.96	0.763	0.776	0.771	0.701	0.810	0.755	0.780	0.750	0.770	0.773	0.759	0.760	0.756
2002	0.96	0.748	0.742	0.750	0.737	0.748	0.745	0.737	0.746	0.740	0.755	0.754	0.753	0.763
2003	0.96	0.747	0.752	0.752	0.737	0.750	0.740	0.746	0.758	0.742	0.740	0.750	0.747	0.745
2004	0.96	0.746	0.760	0.737	0.722	0.717	0.734	0.760	0.750	0.750	0.770	0.750	0.750	0.750
2005	0.96	0.823	0.860	0.780	0.760	0.770	0.763	0.870	0.960	0.935	0.964	0.740	0.778	0.700
2006	0.96	0.788	0.740	0.740	0.760	0.744	0.757	0.806	0.849	0.882	0.803	0.820	0.798	0.752
2007	0.96	0.860	0.785	0.820	0.805	0.867	0.770	0.964	1.001	0.960	1.020	0.823	0.746	0.763
2008	0.96	.87% 0.355	0.990	0.840	0.760	0.760	0.909	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2009	0.96	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2010	0.96	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2011	0.96	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2012	0.96	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
2013	0.96	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
								.98	.956	1.12	.91	.63	.9	.87

TABLE 2

Property within Sphere of Influence
Not Yet Connected to Community System

Land Use Zoning	Acres	Estimated Sewage Generation (gal/ac-d)	Future Sewage Contribution (gal/d)
AE-5	95.1	1,000	95,100
AL-20	738.4	1,000	738,400
C6	1.7	4,000	6,800
CM	0.8	4,000	3,200
M1	6.4	5,000	32,000
M3	405.4	5,000	2,027,000
O	14.3	100	1,430
RA	2.3	2,000	4,600
Total	1,264.4		2,908,530

TABLE 3

Future Flowrates

Year	Flowrate (mgd)
2007	0.862
2008	0.871
2013	0.926
2018	0.981
2023	1.036
2028	1.091
ultimate	To be determined

TABLE 4

Malaga County Water District
2007 Percolation Rate Estimates

Percolation Pond		Pond 1	Pond 2	Pond 3	Pond 4	Pond 5	Pond 6	Pond 7	Pond 8
Beginning Depth	January 5 2007	4.09	4.59	4.92	4.84	4.84	4.50	4.84	4.75
	Secondary Influent Inflow[1] (ft/yr)	25.37	25.37	25.37	25.37	25.37	25.37	25.37	25.37
	Rainfall Inflow[2] (ft/yr)	0.588	0.588	0.588	0.588	0.588	0.588	0.588	0.588
	Evaporation[3] (ft/yr)	5.1375	5.1375	5.1375	5.1375	5.1375	5.1375	5.1375	5.1375
Ending Depth	December 28, 2007	4.50	4.75	5.09	5.00	4.92	4.75	5.00	4.92
	Percolation[4] (ft/yr)	20.41	20.66	20.65	20.66	20.74	20.57	20.66	20.65
	Percolation Rate (ft/day)	**0.056**	**0.057**	**0.057**	**0.057**	**0.057**	**0.056**	**0.057**	**0.057**

Note:

1. Secondary inflow distributed evenly in all ponds.
2. Rainfall inflow based on 2007 rainfall data.
3. Evaporation based on WRCC average year pan evaporation x 0.75
4. Percolation = Beginning depth + Inflows - Evaporation - Ending Depth

Table 5

Malaga County Water District
Wastewater Treatment & Disposal Facilities
0.8 MGD Capacity Wastewater Disposal - Average Year Rainfall Water Balance, Discharge and Storage

DATA:

Month	Number of Days per Month	Average Yr. Rainfall 1/ (in/month)	Average Yr. Evaporation 3/ (in/month)
January	31	2.11	0.98
February	28	1.91	1.58
March	31	1.89	3.15
April	30	1.00	4.73
May	31	0.37	6.98
June	30	0.15	8.55
July	31	0.01	9.30
August	31	0.01	8.03
September	30	0.17	5.93
October	31	0.53	3.75
November	30	1.19	1.73
December	31	1.58	0.90
Total	365	10.92	55.61

Discharge to canal		0	MGD	
Daily Effluent Production 5/	=	800,000	gpd	
Pond Wet Area	=	23.24	acres	
Pond Storage	=	185.9	ac-ft	8 ft deep
Pond Percolation Rate	=	0.60	in/day	
Additional Pond Wet Area	=	11.50	acres	
Additional Pond Storage	=	69.0	ac-ft	6 ft deep
Estimated Pond Percolation Rate	=	1.00	in/day	
Total Storage	=	254.9	ac-ft	
Total Storage	=	83,066,052	gal	
Total Area	=	*34.7*	*acres*	

WWTF POND CALCULATIONS:

Effluent Produced (gal/month)	Effluent To Canal (gal/month)	Effluent to Ponds 18/ (gal/month)	Surface Rainfall 19/ (gal/month)	Surface Evaporation 20/ (gal/month)	Pond Percolation 21/ (gal/month)	Monthly Change in Storage 22/ (gal/month)	Required Storage Capacity 23/ (gal)	
24,800,000	0	24,800,000	1,990,447	924,473	21,418,325	4,447,649	11,578,101	
22,400,000	0	22,400,000	1,801,779	1,490,477	19,345,584	3,365,718	14,943,819	
24,800,000	0	24,800,000	1,782,913	2,971,521	21,418,325	2,193,067	17,136,886	
24,000,000	0	24,000,000	943,340	4,461,998	20,727,411	(246,069)	16,890,817	
24,800,000	0	24,800,000	349,036	6,584,513	21,418,325	(2,853,802)	14,037,015	
24,000,000	0	24,000,000	141,501	8,065,557	20,727,411	(4,651,467)	9,385,548	
24,800,000	0	24,800,000	9,433	8,773,062	21,418,325	(5,381,954)	4,003,594	
24,800,000	0	24,800,000	9,433	7,575,020	21,418,325	(4,183,912)	0	
24,000,000	0	24,000,000	160,368	5,594,006	20,727,411	(2,161,049)	0	*
24,800,000	0	24,800,000	499,970	3,537,525	21,418,325	344,120	344,120	
24,000,000	0	24,000,000	1,122,575	1,631,978	20,727,411	2,763,186	3,107,306	
24,800,000	0	24,800,000	1,490,477	849,006	21,418,325	4,023,146	7,130,452	
292,000,000	0	292,000,000	10,301,272	52,459,136	252,183,503	-2,341,367	* Start at 0 Stored	
896.1	0.0	896.1	31.6	161.0	773.9	-7.2	September 1st	
Total (gal)						-2,341,367		
Total (ac-ft)								

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per WRCC X 0.75
5/ Average Daily Effluent Production
7/ Total wet area of the existing lagoons.
19/ Surface Rainfall = Volume of Average-Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 8 plus additional proposed ponds.
23/ Required Storage = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.

36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from all ponds = Total volume of available storage.
39/ Check Balance = Comparison of this value with 16/.

Maximum Required storage		17,136,886
Total Storage Available 37/:		83,066,052 gal
Extra Storage 38/:		65,929,166 gal
		202 ac-ft
Total Effluent Production 16/:		292,000,000 gal
Total Effluent Exported 17/:		0 gal
Total Surface Rainfall 19/:		10,301,272 gal
Total Evaporation 20/:		52,459,136 gal
Total Percolation 21/:		252,183,503 gal
Effluent Applied to Crop 28/:		0 gal
Check Balance 39/:		294,341,367 gal

Updated: 4/14/08
Print Date: *7/25/08*

EST. 1956 PROVOST & PRITCHARD ENGINEERING GROUP

Table 6

Malaga County Water District
Wastewater Treatment & Disposal Facilities
0.8 MGD Capacity Wastewater Disposal - 100 Year Rainfall Water Balance, Discharge and Storage

DATA:

Month	Number of Days per Month	100 Yr. Rainfall [1/] (in/month)	100 Yr. Evaporation [2/] (in/month)
January	31	5.14	0.90
February	28	3.70	1.46
March	31	4.53	2.09
April	30	2.76	3.71
May	31	0.01	6.21
June	30	0.31	6.85
July	31	0.00	8.14
August	31	0.00	6.99
September	30	1.10	4.68
October	31	1.58	3.09
November	30	3.16	1.20
December	31	1.59	0.85
Total	365	23.88	46.17

Discharge to canal		0	MGD	
Daily Effluent Production [5/]	=	800,000	gpd	
Pond Wet Area [7]	=	23.24	acres	
Pond Storage	=	185.9	ac-ft	8 ft deep
Pond Percolation Rate	=	0.60	in/day	
Additional Pond Wet Area	=	13.50	acres	
Additional Pond Storage	=	81.0	ac-ft	6 ft deep
Estimated Pond Percolation Rate	=	1.00	in/day	
Total Storage	=	266.9	ac-ft	
Total Storage	=	86,976,269	gal	
Total Area	=	*36.7 acres*		

WWTF POND CALCULATIONS:

	Effluent Produced (gal/month)	Effluent To Canal (gal/month)	Effluent to Ponds [18/] (gal/month)	Surface Rainfall [19/] (gal/month)	Surface Evaporation [20/] (gal/month)	Pond Percolation [21/] (gal/month)	Monthly Change in Storage [22/] (gal/month)	Required Storage Capacity [23/] (gal)
	24,800,000	0	24,800,000	5,127,913	897,884	23,101,890	5,928,139	12,154,893
	22,400,000	0	22,400,000	3,691,300	1,456,567	20,866,224	3,768,509	15,923,402
	24,800,000	0	24,800,000	4,519,348	2,085,085	23,101,890	4,132,373	20,055,775
	24,000,000	0	24,000,000	2,753,510	3,701,276	22,356,668	695,566	20,751,341
	24,800,000	0	24,800,000	9,976	6,195,397	23,101,890	(4,487,311)	16,264,030
	24,000,000	0	24,000,000	309,271	6,833,892	22,356,668	(4,881,289)	11,382,741
	24,800,000	0	24,800,000	0	8,120,859	23,101,890	(6,422,749)	4,959,992
	24,800,000	0	24,800,000	0	6,973,563	23,101,890	(5,275,453)	0
	24,000,000	0	24,000,000	1,097,413	4,668,995	22,356,668	(1,928,250)	0 *
	24,800,000	0	24,800,000	1,576,285	3,082,734	23,101,890	191,661	191,661
	24,000,000	0	24,000,000	3,152,569	1,197,178	22,356,668	3,598,723	3,790,384
	24,800,000	0	24,800,000	1,586,261	848,001	23,101,890	2,436,370	6,226,754
Total (gal)	292,000,000	0	292,000,000	23,823,846	46,061,431	272,006,126	-2,243,711	* *Start at 0 Stored*
Total (ac-ft)	896.1	0.0	896.1	73.1	141.4	834.8	-6.9	*September 1st*
							-2,243,711	

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per WRCC X 0.75
5/ Design Capacity Effluent Production
7/ Total existing wet area of the existing lagoons.
19/ Surface Rainfall = Volume of 100 Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 8 plus proposed additional ponds.
23/ Required Storage = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.

36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from all ponds = Total volume of available storage.
39/ Check Balance = Comparison of this value with 16/.

Maximum Required storage	20,751,341	
Total Storage Available [37/]:	86,976,269	gal
Extra Storage [38/]:	**66,224,928**	gal
	203	ac-ft
Total Effluent Production [16/]:	292,000,000	gal
Total Effluent Exported [17/]:	0	gal
Total Surface Rainfall [19/]:	23,823,846	gal
Total Evaporation [20/]:	46,061,431	gal
Total Percolation [21/]:	272,006,126	gal
Effluent Applied to Crop [28/]:	0	gal
Check Balance [39/]:	294,243,711	gal

Updated: 4/14/08
Print Date: *7/25/08*

EST. 1988 PROVOST & PRITCHARD ENGINEERING GROUP

Table 7

Malaga County Water District
Wastewater Treatment & Disposal Facilities
1.2 MGD Capacity Wastewater Disposal - Average Year Rainfall Water Balance, Discharge and Storage

DATA:

Month	Number of Days per Month	Average Yr. Rainfall [1/] (in/month)	Average Yr. Evaporation [3/] (in/month)
January	31	2.11	0.98
February	28	1.91	1.58
March	31	1.89	3.15
April	30	1.00	4.73
May	31	0.37	6.98
June	30	0.15	8.55
July	31	0.01	9.30
August	31	0.01	8.03
September	30	0.17	5.93
October	31	0.53	3.75
November	30	1.19	1.73
December	31	1.58	0.90
Total	365	10.92	55.61

Discharge to canal		0	MGD	
Daily Effluent Production [5/]	=	1,200,000	gpd	
Pond Wet Area	=	23.24	acres	
Pond Storage	=	185.9	ac-ft	8 ft deep
Pond Percolation Rate	=	0.60	in/day	
Additional Pond Wet Area	=	24.50	acres	
Additional Pond Storage	=	147.0	ac-ft	6 ft deep
Estimated Pond Percolation Rate	=	1.00	in/day	
Total Storage	=	332.9	ac-ft	
Total Storage	=	108,482,465	gal	
Total Area	=	*47.7*	*acres*	

WWTF POND CALCULATIONS:

Month	Effluent Produced (gal/month)	Effluent To Canal (gal/month)	Effluent to Ponds [18/] (gal/month)	Surface Rainfall [19/] (gal/month)	Surface Evaporation [20/] (gal/month)	Pond Percolation [21/] (gal/month)	Monthly Change in Storage [22/] (gal/month)	Required Storage Capacity [23/] (gal)
January	37,200,000	0	37,200,000	2,735,289	1,270,419	32,361,502	6,303,368	16,670,036
February	33,600,000	0	33,600,000	2,476,020	2,048,226	29,229,744	4,798,050	21,468,086
March	37,200,000	0	37,200,000	2,450,093	4,083,489	32,361,502	3,205,102	24,673,188
April	36,000,000	0	36,000,000	1,296,346	6,131,715	31,317,583	(152,952)	24,520,236
May	37,200,000	0	37,200,000	479,648	9,048,493	32,361,502	(3,730,347)	20,789,889
June	36,000,000	0	36,000,000	194,452	11,083,756	31,317,583	(6,206,887)	14,583,002
July	37,200,000	0	37,200,000	12,963	12,056,015	32,361,502	(7,204,554)	7,378,448
August	37,200,000	0	37,200,000	12,963	10,409,656	32,361,502	(5,558,195)	1,820,253
September	36,000,000	0	36,000,000	220,379	7,687,330	31,317,583	(2,784,534)	0 *
October	37,200,000	0	37,200,000	687,063	4,861,296	32,361,502	664,265	664,265
November	36,000,000	0	36,000,000	1,542,651	2,242,678	31,317,583	3,982,390	4,646,655
December	37,200,000	0	37,200,000	2,048,226	1,166,711	32,361,502	5,720,013	10,366,668
Total (gal)	438,000,000	0	438,000,000	14,156,093	72,089,784	381,030,590	-964,281	* Start at 0 Stored
Total (ac-ft)	1,344.2	0.0	1,344.2	43.4	221.2	1,169.3	-3.0	September 1st
							-964,281	

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per WRCC X 0.75
5/ Average Daily Effluent Production
7/ Total wet area of the existing lagoons.
19/ Surface Rainfall = Volume of Average-Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 8 plus additional proposed ponds.
23/ Required Storage = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.

36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from all ponds = Total volume of available storage.
39/ Check Balance = Comparison of this value with 16/.

Maximum Required storage		24,673,188
Total Storage Available [37/]:		108,482,465 gal
Extra Storage [38/]:		83,809,277 gal
		257 ac-ft
Total Effluent Production [16/]:		438,000,000 gal
Total Effluent Exported [17/]:		0 gal
Total Surface Rainfall [19/]:		14,156,093 gal
Total Evaporation [20/]:		72,089,784 gal
Total Percolation [21/]:		381,030,590 gal
Effluent Applied to Crop [28/]:		0 gal
Check Balance [39/]:		438,964,281 gal

Updated: 4/14/08
Print Date: *7/25/08*

EST. 1969 PROVOST & PRITCHARD ENGINEERING GROUP

Table 8

Malaga County Water District
Wastewater Treatment & Disposal Facilities
1.2 MGD Capacity Wastewater Disposal - 100 Year Rainfall Water Balance, Discharge and Storage

DATA:

Month	Number of Days per Month	100 Yr. Rainfall [1/] (in/month)	100 Yr. Evaporation [2/] (in/month)
January	31	5.14	0.90
February	28	3.70	1.46
March	31	4.53	2.09
April	30	2.76	3.71
May	31	0.01	6.21
June	30	0.31	6.85
July	31	0.00	8.14
August	31	0.00	6.99
September	30	1.10	4.68
October	31	1.58	3.09
November	30	3.16	1.20
December	31	1.59	0.85
Total	365	23.88	46.17

Discharge to canal		0	MGD	
Daily Effluent Production [5/]	=	1,200,000	gpd	
Pond Wet Area [7]	=	23.24	acres	
Pond Storage	=	185.9	ac-ft	8 ft deep
Pond Percolation Rate	=	0.60	in/day	
Additional Pond Wet Area	=	27.25	acres	
Additional Pond Storage	=	163.5	ac-ft	6 ft deep
Estimated Pond Percolation Rate	=	1.00	in/day	
Total Storage =		349.4	ac-ft	
Total Storage =		113,859,014	gal	
Total Area =		*50.5*	*acres*	

WWTF POND CALCULATIONS:

Effluent Produced (gal/month)	Effluent To Canal (gal/month)	Effluent to Ponds [18/] (gal/month)	Surface Rainfall [19/] (gal/month)	Surface Evaporation [20/] (gal/month)	Pond Percolation [21/] (gal/month)	Monthly Change in Storage [22/] (gal/month)	Required Storage Capacity [23/] (gal)
37,200,000	0	37,200,000	7,047,043	1,233,918	34,676,405	8,336,720	17,457,612
33,600,000	0	33,600,000	5,072,774	2,001,689	31,320,624	5,350,461	22,808,073
37,200,000	0	37,200,000	6,210,721	2,865,432	34,676,405	5,868,884	28,676,957
36,000,000	0	36,000,000	3,784,015	5,086,484	33,557,812	1,139,719	29,816,676
37,200,000	0	37,200,000	13,710	8,514,034	34,676,405	(5,976,729)	23,839,947
36,000,000	0	36,000,000	425,016	9,391,487	33,557,812	(6,524,283)	17,315,664
37,200,000	0	37,200,000	0	11,160,103	34,676,405	(8,636,508)	8,679,156
37,200,000	0	37,200,000	0	9,583,430	34,676,405	(7,059,835)	1,619,321
36,000,000	0	36,000,000	1,508,122	6,416,374	33,557,812	(2,466,064)	0 *
37,200,000	0	37,200,000	2,166,212	4,236,452	34,676,405	453,355	453,355
36,000,000	0	36,000,000	4,332,423	1,645,224	33,557,812	5,129,387	5,582,742
37,200,000	0	37,200,000	2,179,922	1,165,367	34,676,405	3,538,150	9,120,892
438,000,000	0	438,000,000	32,739,958	63,299,994	408,286,707	-846,743	* *Start at 0 Stored*
1,344.2	0.0	1,344.2	100.5	194.3	1,253.0	-2.6	*September 1st*
						-846,743	

Total (gal)
Total (ac-ft)

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per WRCC X 0.75
5/ Design Capacity Effluent Production
7/ Total existing wet area of the existing lagoons.
19/ Surface Rainfall = Volume of 100 Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 8 plus proposed additional ponds.
23/ Required Storage = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.

36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from all ponds = Total volume of available storage.
39/ Check Balance = Comparison of this value with 16/.

Maximum Required storage	29,816,676	
Total Storage Available [37/]:	113,859,014	gal
Extra Storage [38/]:	**84,042,338**	gal
	258	ac-ft
Total Effluent Production [16/]:	438,000,000	gal
Total Effluent Exported [17/]:	0	gal
Total Surface Rainfall [19/]:	32,739,958	gal
Total Evaporation [20/]:	63,299,994	gal
Total Percolation [21/]:	408,286,707	gal
Effluent Applied to Crop [28/]:	0	gal
Check Balance [39/]:	438,846,743	gal

Updated: 4/14/08
Print Date: *7/25/08*

PROVOST & PRITCHARD ENGINEERING GROUP

Table 9

Malaga County Water District
Wastewater Treatment & Disposal Facilities
1.65 MGD Capacity Wastewater Disposal - Average Year Rainfall Water Balance, Discharge and Storage

DATA:

Month	Number of Days per Month	Average Yr. Rainfall [1/] (in/month)	Average Yr. Evaporation [3/] (in/month)
January	31	2.11	0.98
February	28	1.91	1.58
March	31	1.89	3.15
April	30	1.00	4.73
May	31	0.37	6.98
June	30	0.15	8.55
July	31	0.01	9.30
August	31	0.01	8.03
September	30	0.17	5.93
October	31	0.53	3.75
November	30	1.19	1.73
December	31	1.58	0.90
Total	365	10.92	55.61

Discharge to canal		0	MGD	
Daily Effluent Production [5/]	=	1,650,000	gpd	
Pond Wet Area	=	23.24	acres	
Pond Storage	=	185.9	ac-ft	*8 ft deep*
Pond Percolation Rate	=	0.60	in/day	
Additional Pond Wet Area	=	39.50	acres	
Additional Pond Storage	=	237.0	ac-ft	*6 ft deep*
Estimated Pond Percolation Rate	=	1.00	in/day	
Total Storage	=	422.9	ac-ft	
Total Storage	=	137,809,096	gal	
Total Area	=	*62.7*	*acres*	

WWTF POND CALCULATIONS:

Month	Effluent Produced (gal/month)	Effluent To Canal (gal/month)	Effluent to Ponds [18/] (gal/month)	Surface Rainfall [19/] (gal/month)	Surface Evaporation [20/] (gal/month)	Pond Percolation [21/] (gal/month)	Monthly Change in Storage [22/] (gal/month)	Required Storage Capacity [23/] (gal)
January	51,150,000	0	51,150,000	3,594,723	1,669,587	44,988,246	8,086,890	21,126,112
February	46,200,000	0	46,200,000	3,253,991	2,691,783	40,634,545	6,127,663	27,253,775
March	51,150,000	0	51,150,000	3,219,917	5,366,529	44,988,246	4,015,142	31,268,917
April	49,500,000	0	49,500,000	1,703,660	8,058,312	43,537,013	(391,665)	30,877,252
May	51,150,000	0	51,150,000	630,354	11,891,547	44,988,246	(5,099,439)	25,777,813
June	49,500,000	0	49,500,000	255,549	14,566,293	43,537,013	(8,347,757)	17,430,056
July	51,150,000	0	51,150,000	17,037	15,844,038	44,988,246	(9,665,247)	7,764,809
August	51,150,000	0	51,150,000	17,037	13,680,390	44,988,246	(7,501,599)	263,210
September	49,500,000	0	49,500,000	289,622	10,102,704	43,537,013	(3,850,095)	0 *
October	51,150,000	0	51,150,000	902,940	6,388,725	44,988,246	675,969	675,969
November	49,500,000	0	49,500,000	2,027,355	2,947,332	43,537,013	5,043,010	5,718,979
December	51,150,000	0	51,150,000	2,691,783	1,533,294	44,988,246	7,320,243	13,039,222
Total (gal)	602,250,000	0	602,250,000	18,603,968	94,740,534	529,700,319	-3,586,885	* *Start at 0 Stored*
Total (ac-ft)	1,848.2	0.0	1,848.2	57.1	290.7	1,625.6	-11.0	*September 1st*
							-3,586,885	

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per WRCC X 0.75
5/ Average Daily Effluent Production
7/ Total wet area of the existing lagoons.
19/ Surface Rainfall = Volume of Average-Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 8 plus additional proposed ponds.
23/ Required Storage = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.

36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from all ponds = Total volume of available storage.
39/ Check Balance = Comparison of this value with 16/.

Maximum Required storage		31,268,917
Total Storage Available [37/]:		137,809,096 gal
Extra Storage [38/]:		106,540,179 gal
		327 ac-ft
Total Effluent Production [16/]:		602,250,000 gal
Total Effluent Exported [17/]:		0 gal
Total Surface Rainfall [19/]:		18,603,968 gal
Total Evaporation [20/]:		94,740,534 gal
Total Percolation [21/]:		529,700,319 gal
Effluent Applied to Crop [28/]:		0 gal
Check Balance [39/]:		605,836,885 gal

Updated: 4/14/08
Print Date: *7/25/08*

EST. 1968 PROVOST & PRITCHARD ENGINEERING GROUP

Table 10

Malaga County Water District
Wastewater Treatment & Disposal Facilities
1.65 MGD Capacity Wastewater Disposal - 100 Year Rainfall Water Balance, Discharge and Storage

DATA:

Month	Number of Days per Month	100 Yr. Rainfall [1/] (in/month)	100 Yr. Evaporation [2/] (in/month)
January	31	5.14	0.90
February	28	3.70	1.46
March	31	4.53	2.09
April	30	2.76	3.71
May	31	0.01	6.21
June	30	0.31	6.85
July	31	0.00	8.14
August	31	0.00	6.99
September	30	1.10	4.68
October	31	1.58	3.09
November	30	3.16	1.20
December	31	1.59	0.85
Total	365	23.88	46.17

Discharge to canal		0	MGD	
Daily Effluent Production [5/]	=	1,650,000	gpd	
Pond Wet Area [7]	=	23.24	acres	
Pond Storage	=	185.9	ac-ft	8 ft deep
Pond Percolation Rate	=	0.60	in/day	
Additional Pond Wet Area	=	43.00	acres	
Additional Pond Storage	=	258.0	ac-ft	6 ft deep
Estimated Pond Percolation Rate	=	1.00	in/day	
Total Storage =		443.9	ac-ft	
Total Storage =		144,651,976	gal	
Total Area =		*66.2*	*acres*	

WWTF POND CALCULATIONS:

Effluent Produced (gal/month)	Effluent To Canal (gal/month)	Effluent to Ponds [18/] (gal/month)	Surface Rainfall [19/] (gal/month)	Surface Evaporation [20/] (gal/month)	Pond Percolation [21/] (gal/month)	Monthly Change in Storage [22/] (gal/month)	Required Storage Capacity [23/] (gal)
51,150,000	0	51,150,000	9,245,318	1,618,830	47,934,486	10,842,002	22,525,270
46,200,000	0	46,200,000	6,655,190	2,626,102	43,295,665	6,933,423	29,458,693
51,150,000	0	51,150,000	8,148,111	3,759,283	47,934,486	7,604,342	37,063,035
49,500,000	0	49,500,000	4,964,412	6,673,177	46,388,213	1,403,022	38,466,057
51,150,000	0	51,150,000	17,987	11,169,927	47,934,486	(7,936,426)	30,529,631
49,500,000	0	49,500,000	557,597	12,321,095	46,388,213	(8,651,711)	21,877,920
51,150,000	0	51,150,000	0	14,641,418	47,934,486	(11,425,904)	10,452,016
51,150,000	0	51,150,000	0	12,572,913	47,934,486	(9,357,399)	1,094,617
49,500,000	0	49,500,000	1,978,570	8,417,916	46,388,213	(3,327,559)	0 *
51,150,000	0	51,150,000	2,841,946	5,557,983	47,934,486	499,477	499,477
49,500,000	0	49,500,000	5,683,892	2,158,440	46,388,213	6,637,239	7,136,716
51,150,000	0	51,150,000	2,859,933	1,528,895	47,934,486	4,546,552	11,683,268
602,250,000	0	602,250,000	42,952,956	83,045,979	564,389,919	-2,232,942	* *Start at 0 Stored*
1,848.2	**0.0**	**1,848.2**	**131.8**	**254.9**	**1,732.0**	**-6.9**	*September 1st*
						-2,232,942	

1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per WRCC X 0.75
5/ Design Capacity Effluent Production
7/ Total existing wet area of the existing lagoons.
19/ Surface Rainfall = Volume of 100 Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 8 plus proposed additional ponds.
23/ Required Storage = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.

36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from all ponds = Total volume of available storage.
39/ Check Balance = Comparison of this value with 16/.

Maximum Required storage	38,466,057	
Total Storage Available [37/]:	144,651,976	gal
Extra Storage [38/]:	106,185,919	gal
	326	ac-ft
Total Effluent Production [16/]:	602,250,000	gal
Total Effluent Exported [17/]:	0	gal
Total Surface Rainfall [19/]:	42,952,956	gal
Total Evaporation [20/]:	83,045,979	gal
Total Percolation [21/]:	564,389,919	gal
Effluent Applied to Crop [28/]:	0	gal
Check Balance [39/]:	604,482,942	gal

Updated: 4/14/08
Print Date: *7/25/08*

EST. 1968 PROVOST & PRITCHARD ENGINEERING GROUP

Table 11

Malaga County Water District
Wastewater Treatment & Disposal Facilities
Disposal Pond Acreage Required to Replace 0.45 MGD Discharge to Central Canal

DATA:

Month	Number of Days per Month	Average Yr. Rainfall [1/] (in/month)	Average Yr. Evaporation [3/] (in/month)
January	31	2.11	0.98
February	28	1.91	1.58
March	31	1.89	3.15
April	30	1.00	4.73
May	31	0.37	6.98
June	30	0.15	8.55
July	31	0.01	9.30
August	31	0.01	8.03
September	30	0.17	5.93
October	31	0.53	3.75
November	30	1.19	1.73
December	31	1.58	0.90
Total	365	10.92	55.61

Daily Effluent Production [5/] =	450,000	gpd		
Pond Wet Area =	0.00	acres		
Pond Storage =	0.0	ac-ft	8 ft deep	
Pond Percolation Rate =	0.60	in/day		
Additional Pond Wet Area =	15.00	acres		
Additional Pond Storage =	90.0	ac-ft	6 ft deep	
Estimated Pond Percolation Rate =	1.00	in/day		
Total Storage =	90.0	ac-ft		
Total Storage =	29,326,631	gal		
Total Area =	*15.0*	*acres*	Total (gal)	

WWTF POND CALCULATIONS:

Effluent Produced (gal/month)	Effluent To Canal (gal/month)	Effluent to Ponds [18/] (gal/month)	Surface Rainfall [19/] (gal/month)	Surface Evaporation [20/] (gal/month)	Pond Percolation [21/] (gal/month)	Monthly Change in Storage [22/] (gal/month)	Required Storage Capacity [23/] (gal)
13,950,000	0	13,950,000	859,433	399,168	12,626,744	1,783,521	4,456,076
12,600,000	0	12,600,000	777,970	643,557	11,404,801	1,329,612	5,785,688
13,950,000	0	13,950,000	769,824	1,283,040	12,626,744	810,040	6,595,728
13,500,000	0	13,500,000	407,314	1,926,597	12,219,429	(238,712)	6,357,016
13,950,000	0	13,950,000	150,706	2,843,054	12,626,744	(1,369,092)	4,987,924
13,500,000	0	13,500,000	61,097	3,482,537	12,219,429	(2,140,869)	2,847,055
13,950,000	0	13,950,000	4,073	3,788,023	12,626,744	(2,460,694)	386,361
13,950,000	0	13,950,000	4,073	3,270,734	12,626,744	(1,943,405)	0
13,500,000	0	13,500,000	69,243	2,415,374	12,219,429	(1,065,560)	0 *
13,950,000	0	13,950,000	215,877	1,527,429	12,626,744	11,704	11,704
13,500,000	0	13,500,000	484,704	704,654	12,219,429	1,060,621	1,072,325
13,950,000	0	13,950,000	643,557	366,583	12,626,744	1,600,230	2,672,555
164,250,000	0	164,250,000	4,447,871	22,650,750	148,669,725	-2,622,604	* Start at 0 Stored
504.1	0.0	504.1	13.6	69.5	456.3	-8.0	*September 1st*
						-2,622,604	

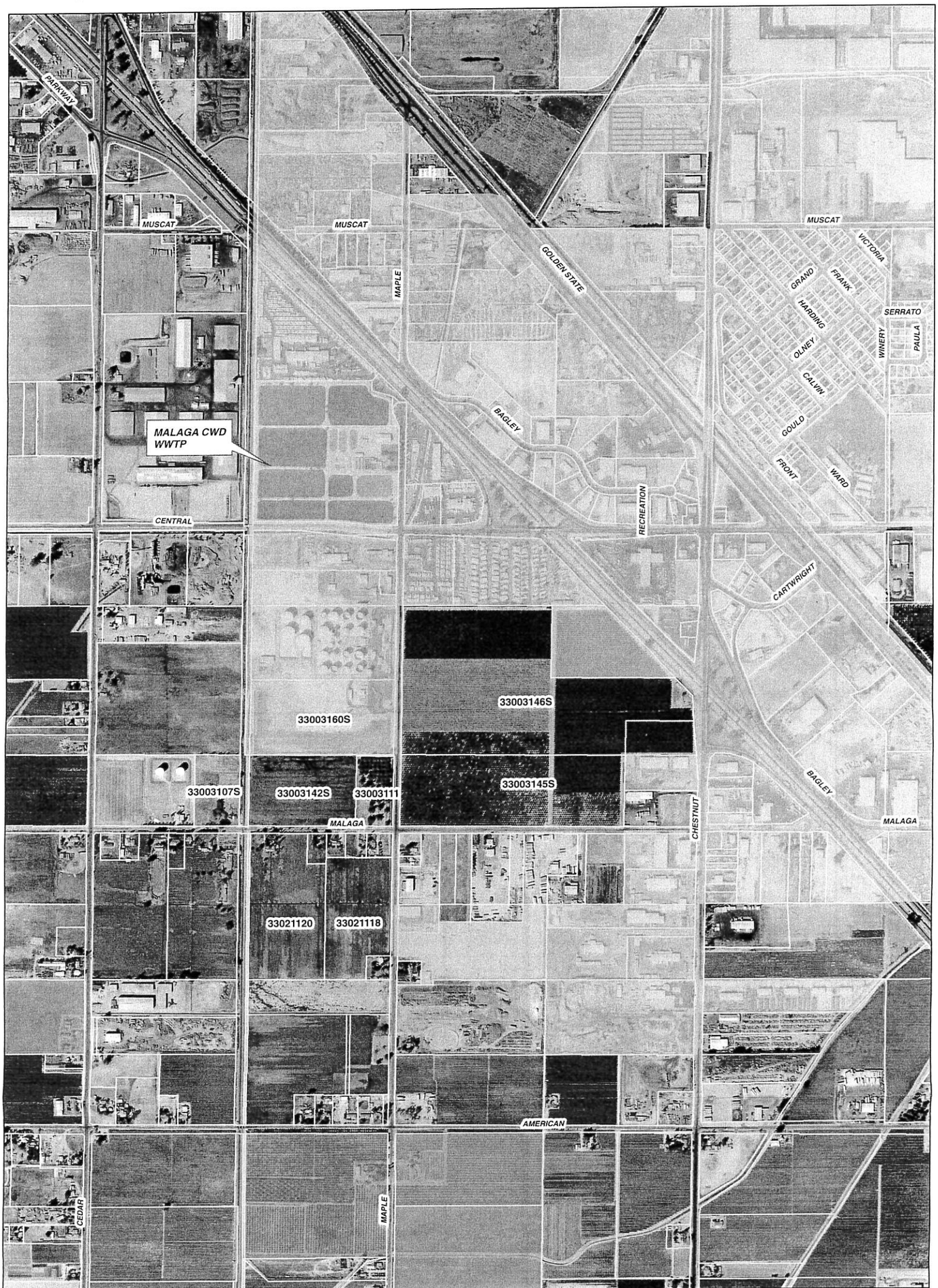
1/ Rainfall Data per the Western Regional Climate Center.
3/ Evaporation data per WRCC X 0.75
5/ Average Daily Effluent Production
7/ Total wet area of the existing lagoons.
19/ Surface Rainfall = Volume of Average-Year rainfall on the existing WWTF treatment and storage ponds and proposed storage ponds.
20/ Surface Evaporation = Volume of effluent and rain water evaporating from the existing WWTF treatment and disposal ponds.
21/ Pond Percolation = Volume of effluent and rain water percolating into the ground for existing ponds 1 through 8 plus additional proposed ponds.
23/ Required Storage = Theoretical starting point Sept. 1st where pond storage starts at zero with monthly contributions.

36/ Maximum Storage Needed = Peak end of month pond storage volume needed (gallons & ac-ft).
37/ Storage Available from all ponds = Total volume of available storage.
39/ Check Balance = Comparison of this value with 16/.

Maximum Required storage		6,595,728
Total Storage Available [37/]:		29,326,631 gal
Extra Storage [38/]:		22,730,903 gal
		70 ac-ft
Total Effluent Production [16/]:		164,250,000 gal
Total Effluent Exported [17/]:		0 gal
Total Surface Rainfall [19/]:		4,447,871 gal
Total Evaporation [20/]:		22,650,750 gal
Total Percolation [21/]:		148,669,725 gal
Effluent Applied to Crop [28/]:		0 gal
Check Balance [39/]:		166,872,604 gal

Updated: 4/14/08
Print Date: *7/25/08*

EST. 1984 PROVOST & PRITCHARD ENGINEERING GROUP



0 400 800 Feet

EST. 1968
PROVOST & PRITCHARD
ENGINEERING GROUP
An Employee Owned Company

286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

Legend

- Malaga CWD Boundary
- Fresno Co. Parcel
- Ag Preserve Parcel

Figure 2

Disposal Capacity Study
Malaga CWD

7/14/2008 \\pinefiat\dwg_dgn\Clients\Malaga CWD - 1057\1057OG01_Ongoing\400\10570801-Disposal Capacity\GIS\Map\MCWD-disposal overview.mxd

N

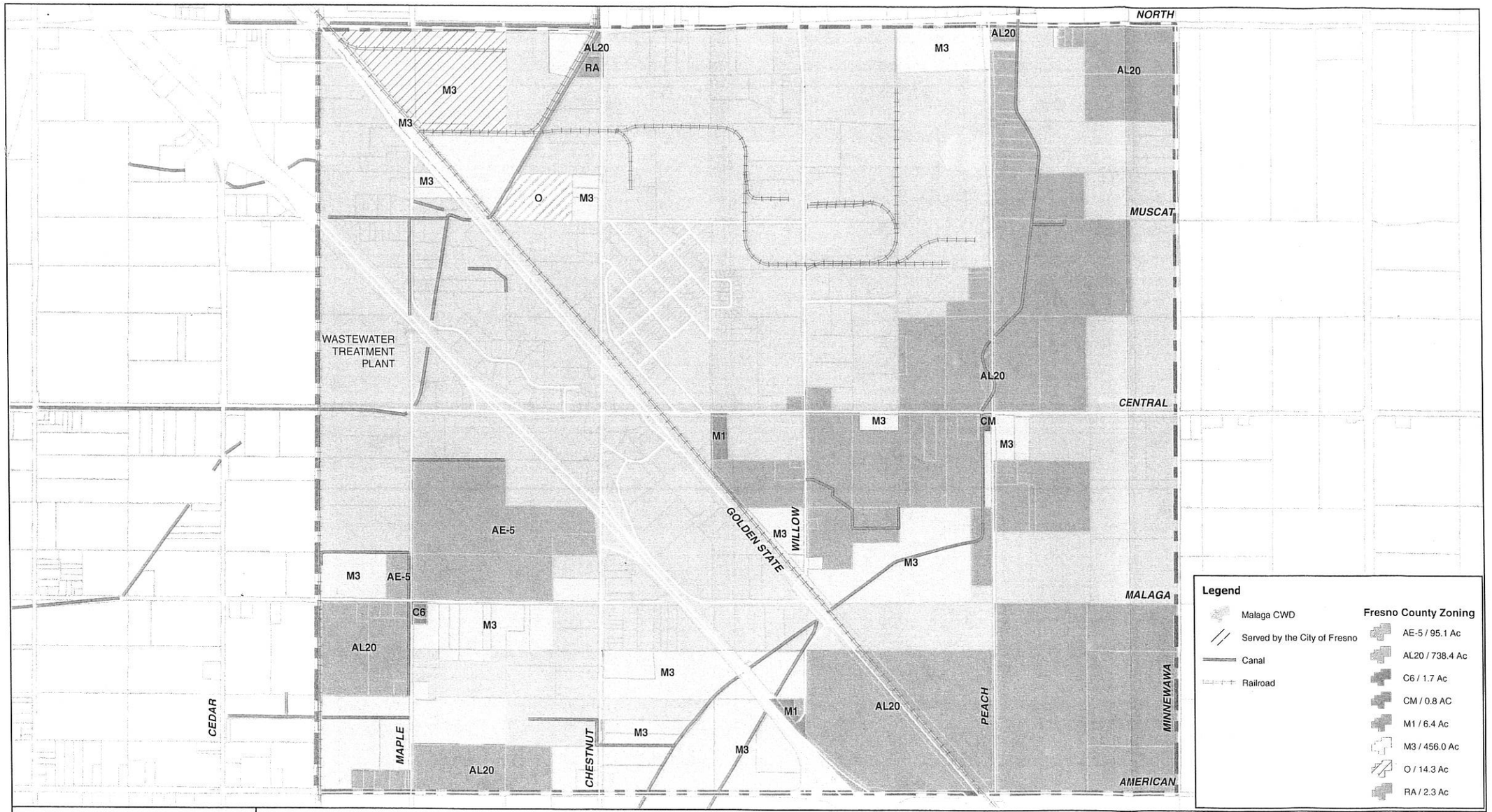
SCALE IN FEET

0 100 200 400

APN 330 031 42S
OWNER: SP PIPE
MALAGA COUNTY WATER DISTRICT
FRESNO COUNTY, CA

DISPOSAL SITE LAYOUT
FIGURE 3

DESIGN ENGINEER:	MICHAEL TAYLOR
DRAFTER:	IRM
SCALE:	1"=200'
DATE:	5/16/2008
JOB NO:	10570801 410
SHEET	OF



0 0.125 0.25 Miles

PROVOST & PRITCHARD ENGINEERING GROUP
EST. 1956
An Employee Owned Company
286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

MALAGA COUNTY WATER DISTRICT

EXISTING ZONING
JULY 2008

Figure 1

Zoning
Malaga CWD

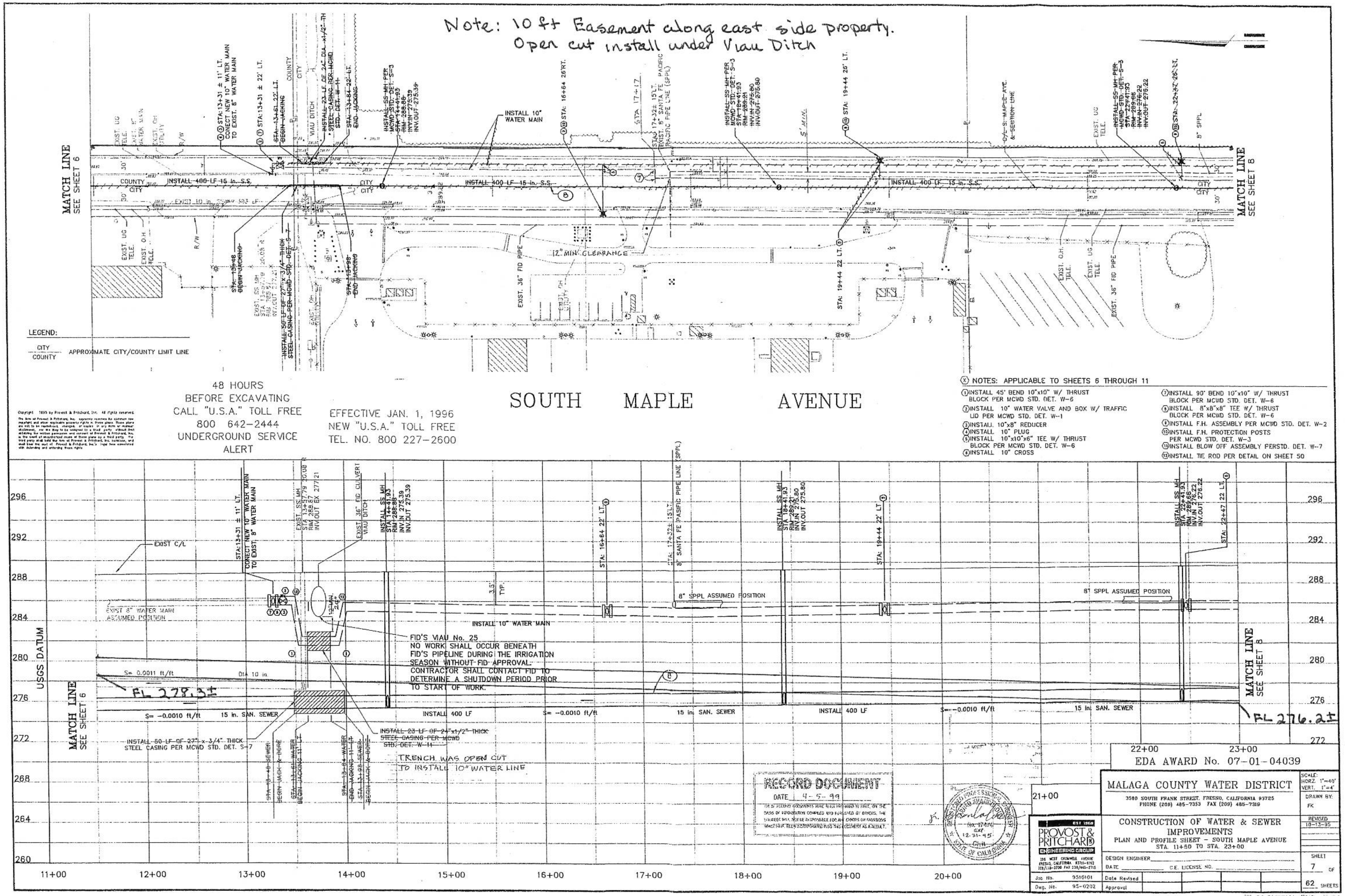
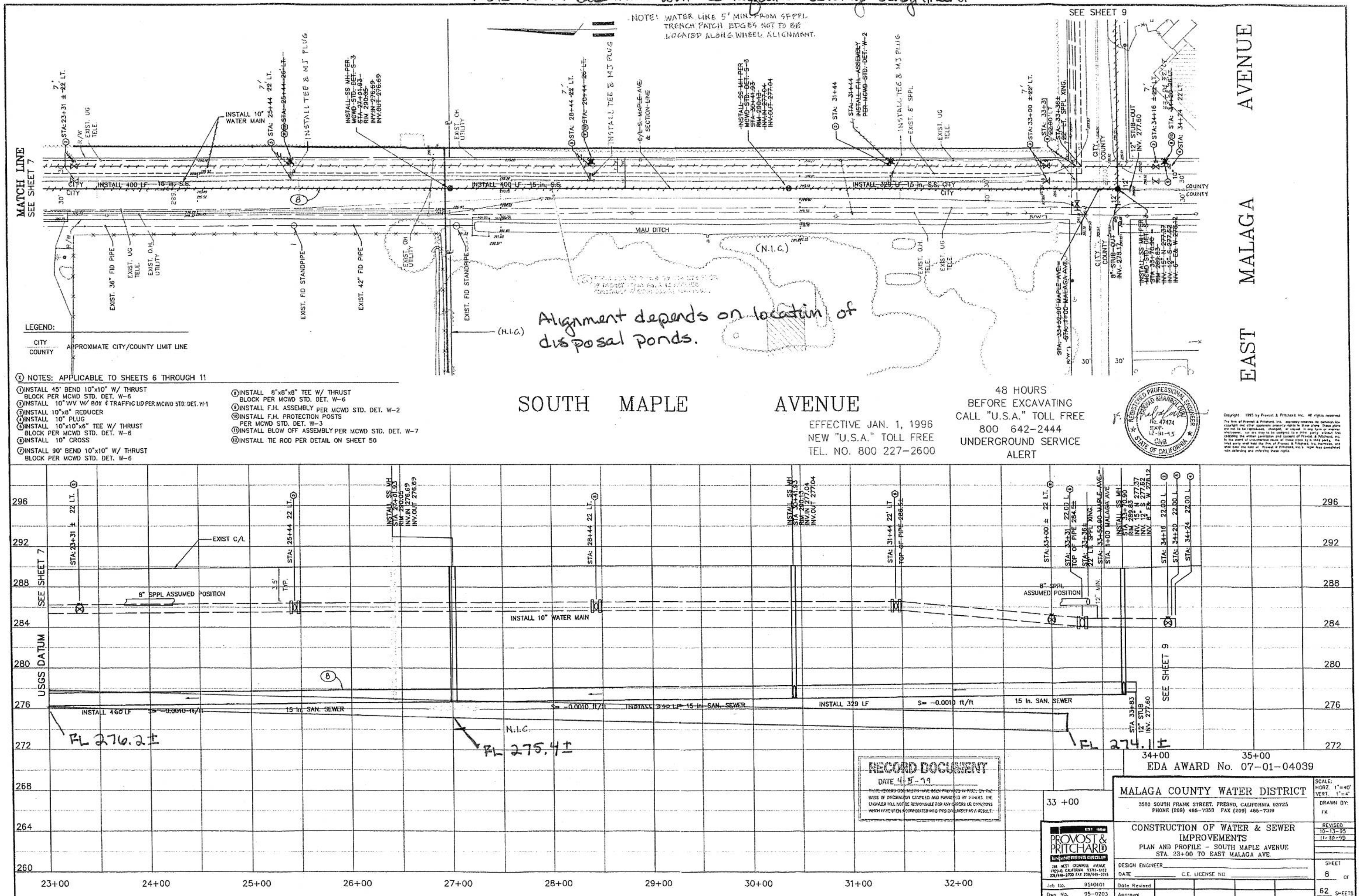

Note: 10 ft Easement along east side property.
Open cut install under Viau Ditch
MATCH LINE
SEE SHEET 6
MATCH LINE
SEE SHEET 8
LEGEND:
CITY / COUNTY APPROXIMATE CITY/COUNTY LIMIT LINE
48 HOURS
BEFORE EXCAVATING
CALL "U.S.A." TOLL FREE
800 642-2444
UNDERGROUND SERVICE
ALERT
EFFECTIVE JAN. 1, 1996
NEW "U.S.A." TOLL FREE
TEL. NO. 800 227-2600
SOUTH MAPLE AVENUE
NOTES: APPLICABLE TO SHEETS 6 THROUGH 11
1 INSTALL 45° BEND 10"x10" W/ THRUST BLOCK PER MCWD STD. DET. W-6
2 INSTALL 10" WATER VALVE AND BOX W/ TRAFFIC LID PER MCWD STD. DET. W-1
3 INSTALL 10"x8" REDUCER
4 INSTALL 10" PLUG
5 INSTALL 10"x10"x6" TEE W/ THRUST BLOCK PER MCWD STD. DET. W-6
6 INSTALL 10" CROSS
7 INSTALL 90° BEND 10"x10" W/ THRUST BLOCK PER MCWD STD. DET. W-6
8 INSTALL 8"x8"x8" TEE W/ THRUST BLOCK PER MCWD STD. DET. W-6
9 INSTALL F.H. ASSEMBLY PER MCWD STD. DET. W-2
10 INSTALL F.H. PROTECTION POSTS PER MCWD STD. DET. W-3
11 INSTALL BLOW OFF ASSEMBLY PERSTD. DET. W-7
12 INSTALL TIE ROD PER DETAIL ON SHEET 50
INSTALL 400 LF 15 in. S.S.
INSTALL 10" WATER MAIN
12" MIN. CLEARANCE
EXIST. 36" FID PIPE
STA: 13+31 ± 11' LT. CONECT NEW 10" WATER MAIN TO EXIST. 8" WATER MAIN
INSTALL 50 LF OF 27" x 3/4" THICK STEEL CASING PER MCWD STD. DET. S-7
INSTALL 23 LF OF 24" DIA. x1/2" TH STEEL CASING PER MCWD STD. DET. W-11
INSTALL SS MH PER MCWD STD. DET. S-3 STA 14+41.93 RIM 288.88 INV.IN 275.39 INV.OUT 275.39
STA: 16+64 22' LT.
STA: 17+32± 15' LT. EXIST. 8" SANTA FE PACIFIC PIPE LINE (SPPL)
INSTALL SS MH PER MCWD STD. DET. S-3 STA 18+41.93 RIM 289.21 INV.IN 275.80 INV.OUT 275.80
STA: 19+44 22' LT.
INSTALL SS MH PER MCWD STD. DET. S-3 STA 22+41.93 RIM 289.66 INV.IN 276.22 INV.OUT 275.22
C/L S. MAPLE AVE. & SECTION LINE
USGS DATUM
EXIST C/L
EXIST 8" WATER MAIN ASSUMED POSITION
FID'S VIAU No. 25
NO WORK SHALL OCCUR BENEATH FID'S PIPELINE DURING THE IRRIGATION SEASON WITHOUT FID APPROVAL. CONTRACTOR SHALL CONTACT FID TO DETERMINE A SHUTDOWN PERIOD PRIOR TO START OF WORK.
FL 278.3±
FL 276.2±
S= 0.0011 ft/ft
S= -0.0010 ft/ft
15 in. SAN. SEWER
INSTALL 400 LF
8" SPPL ASSUMED POSITION
TRENCH WAS OPEN CUT
TO INSTALL 10" WATER LINE
RECORD DOCUMENT
DATE 4-5-99
EDA AWARD No. 07-01-04039
MALAGA COUNTY WATER DISTRICT
3580 SOUTH FRANK STREET, FRESNO, CALIFORNIA 93725
PHONE (209) 485-7353 FAX (209) 485-7319
CONSTRUCTION OF WATER & SEWER IMPROVEMENTS
PLAN AND PROFILE SHEET - SOUTH MAPLE AVENUE
STA. 11+50 TO STA. 23+00
PROVOST & PRITCHARD ENGINEERING GROUP
SHEET 7 OF 62 SHEETS
Job No. 9510101
Dwg. No. 95-0202
CCO #1

FIGURE 4

Note: 10 ft easement will be require along alignment



FIGURES

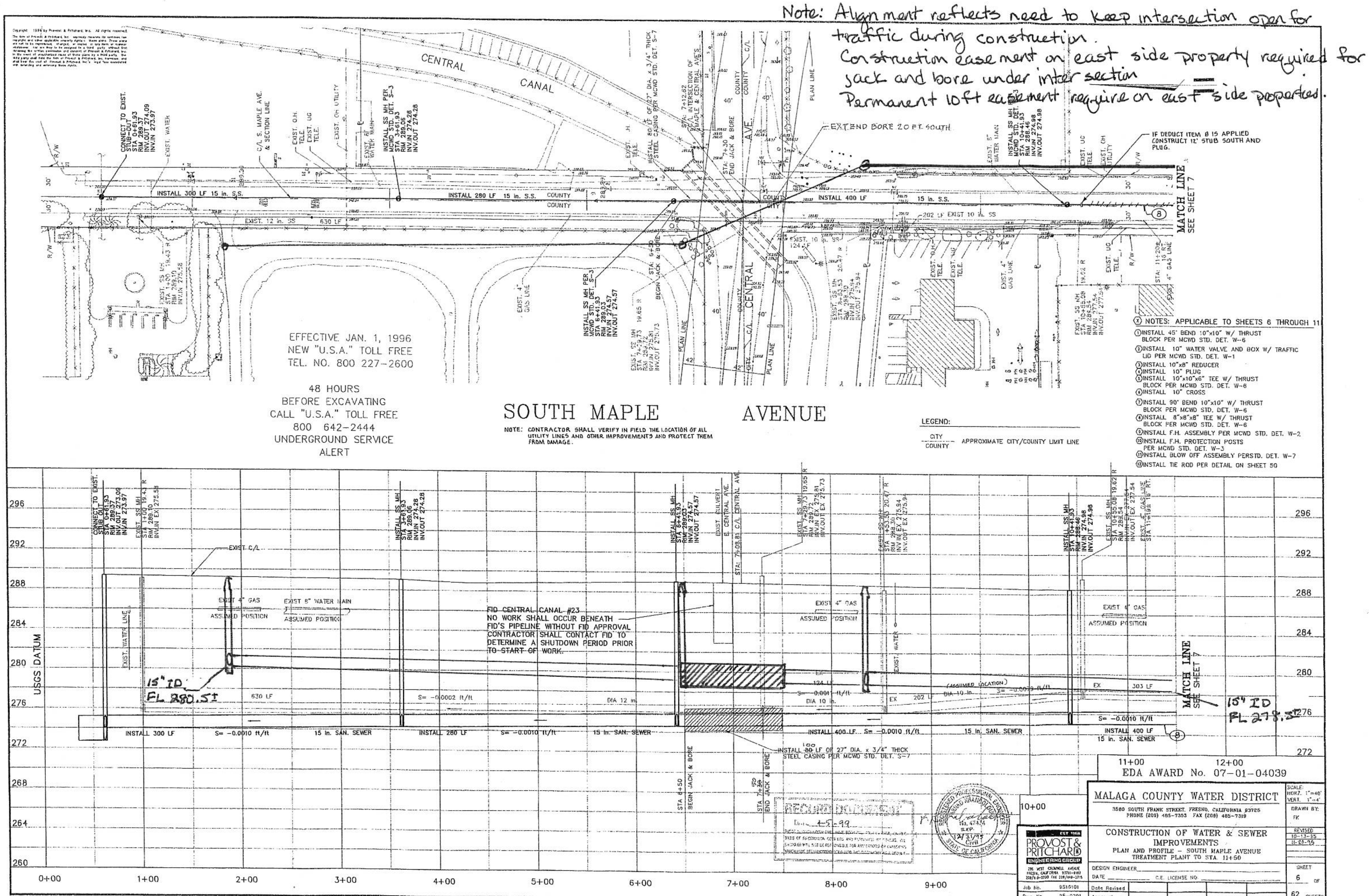
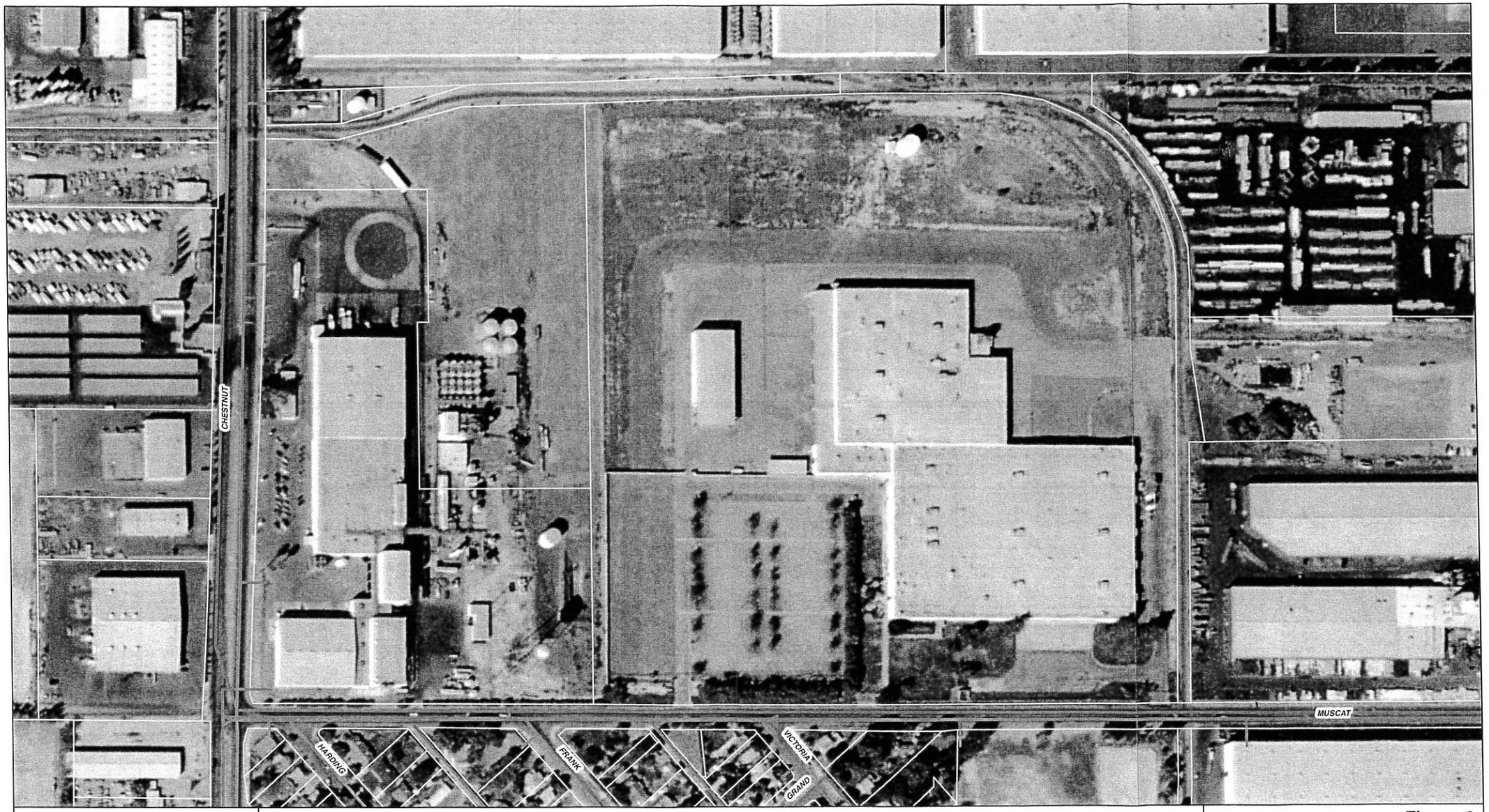

Note: Alignment reflects need to keep intersection open for traffic during construction.
Construction easement on east side property required for jack and bore under intersection
Permanent 10ft easement require on east side properties.
CENTRAL CANAL
SOUTH MAPLE AVENUE
NOTE: CONTRACTOR SHALL VERIFY IN FIELD THE LOCATION OF ALL UTILITY LINES AND OTHER IMPROVEMENTS AND PROTECT THEM FROM DAMAGE.
EFFECTIVE JAN. 1, 1996
NEW "U.S.A." TOLL FREE
TEL. NO. 800 227-2600
48 HOURS
BEFORE EXCAVATING
CALL "U.S.A." TOLL FREE
800 642-2444
UNDERGROUND SERVICE
ALERT
CONNECT TO EXIST. STUB-OUT STA 0+61.93 RIM 289.37 INV.OUT 274.09 INV.IN 273.97
EXIST. SS MH STA 1+00 19.43 R RIM 289.10 INV.IN 275.58
INSTALL 300 LF 15 in. S.S.
C/L S. MAPLE AVE. & SECTION LINE
INSTALL SS MH PER MCWD STD. DET. S-3 STA 3+61.93 RIM 289.06 INV.IN 274.28 INV.OUT 274.28
INSTALL 280 LF 15 in. S.S.
INSTALL SS MH PER MCWD STD. DET. S-3 STA 6+41.93 RIM 289.03 INV.IN 274.57 INV.OUT 274.57
INSTALL 80 LF OF 27" DIA. x 3/4" THICK STEEL CASING PER MCWD STD. DET. S-7
STA: 7+12.62 C/L INTERSECTION OF MAPLE & CENTRAL AVE'S
STA: 7+30 END JACK & BORE
STA: 6+50 BEGIN JACK & BORE
EXT. END BORE 20 FT. SOUTH
INSTALL 400 LF 15 in. S.S.
INSTALL SS MH PER MCWD STD. DET. S-3 STA 10+41.93 RIM 288.46 INV.IN 274.98 INV.OUT 274.98
IF DEDUCT ITEM 8 15 APPLIED CONSTRUCT 12' STUB SOUTH AND PLUG.
MATCH LINE SEE SHEET 7
NOTES: APPLICABLE TO SHEETS 6 THROUGH 11
1 INSTALL 45° BEND 10"x10" W/ THRUST BLOCK PER MCWD STD. DET. W-6
2 INSTALL 10" WATER VALVE AND BOX W/ TRAFFIC LID PER MCWD STD. DET. W-1
3 INSTALL 10"x8" REDUCER
4 INSTALL 10" PLUG
5 INSTALL 10"x10"x6" TEE W/ THRUST BLOCK PER MCWD STD. DET. W-6
6 INSTALL 10" CROSS
7 INSTALL 90° BEND 10"x10" W/ THRUST BLOCK PER MCWD STD. DET. W-6
8 INSTALL 8"x8"x8" TEE W/ THRUST BLOCK PER MCWD STD. DET. W-6
9 INSTALL F.H. ASSEMBLY PER MCWD STD. DET. W-2
10 INSTALL F.H. PROTECTION POSTS PER MCWD STD. DET. W-3
11 INSTALL BLOW OFF ASSEMBLY PERSTD. DET. W-7
12 INSTALL TIE ROD PER DETAIL ON SHEET 50
LEGEND:
CITY / COUNTY APPROXIMATE CITY/COUNTY LIMIT LINE
USGS DATUM
FID CENTRAL CANAL #23
NO WORK SHALL OCCUR BENEATH FID'S PIPELINE WITHOUT FID APPROVAL
CONTRACTOR SHALL CONTACT FID TO DETERMINE A SHUTDOWN PERIOD PRIOR TO START OF WORK.
15" ID FL 280.5±
15" ID FL 278.5±
INSTALL 300 LF S= -0.0010 ft/ft 15 in. SAN. SEWER
INSTALL 280 LF S= -0.0010 ft/ft 15 in. SAN. SEWER
INSTALL 400 LF S= -0.0010 ft/ft 15 in. SAN. SEWER
11+00 12+00
EDA AWARD No. 07-01-04039
MALAGA COUNTY WATER DISTRICT
3580 SOUTH FRANK STREET, FRESNO, CALIFORNIA 93725
PHONE (209) 485-7353 FAX (209) 485-7319
CONSTRUCTION OF WATER & SEWER IMPROVEMENTS
PLAN AND PROFILE - SOUTH MAPLE AVENUE TREATMENT PLANT TO STA. 11+50
PROVOST & PRITCHARD ENGINEERING GROUP
SCALE: HORZ. 1"=40' VERT. 1"=4'
SHEET 6 OF 62 SHEETS
Job No. 9510101
Dwg. No. 35-0201

FIGURE 5A



0 100 200 Feet

N

EST. 1968
PROVOST & PRITCHARD
ENGINEERING GROUP
An Employee Owned Company

286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

Legend

- Existing Water Main
- Existing Sewer Main
- Fresno County Parcel

Figure 6

Disposal Alternatives
ADM and Calpine Property
Malaga CWD

Photography by AirPhoto USA, 2007

7/7/2008 \\pinefiat\dwg_dgn\Clients\Malaga CWD - 1057\1057OG01_Ongoing\GIS\2008 PROJECTS\Map\400\Disposal Alt-ADM.mxd

0 100 200 Feet

EST. 1958
PROVOST & PRITCHARD ENGINEERING GROUP
An Employee Owned Company
286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

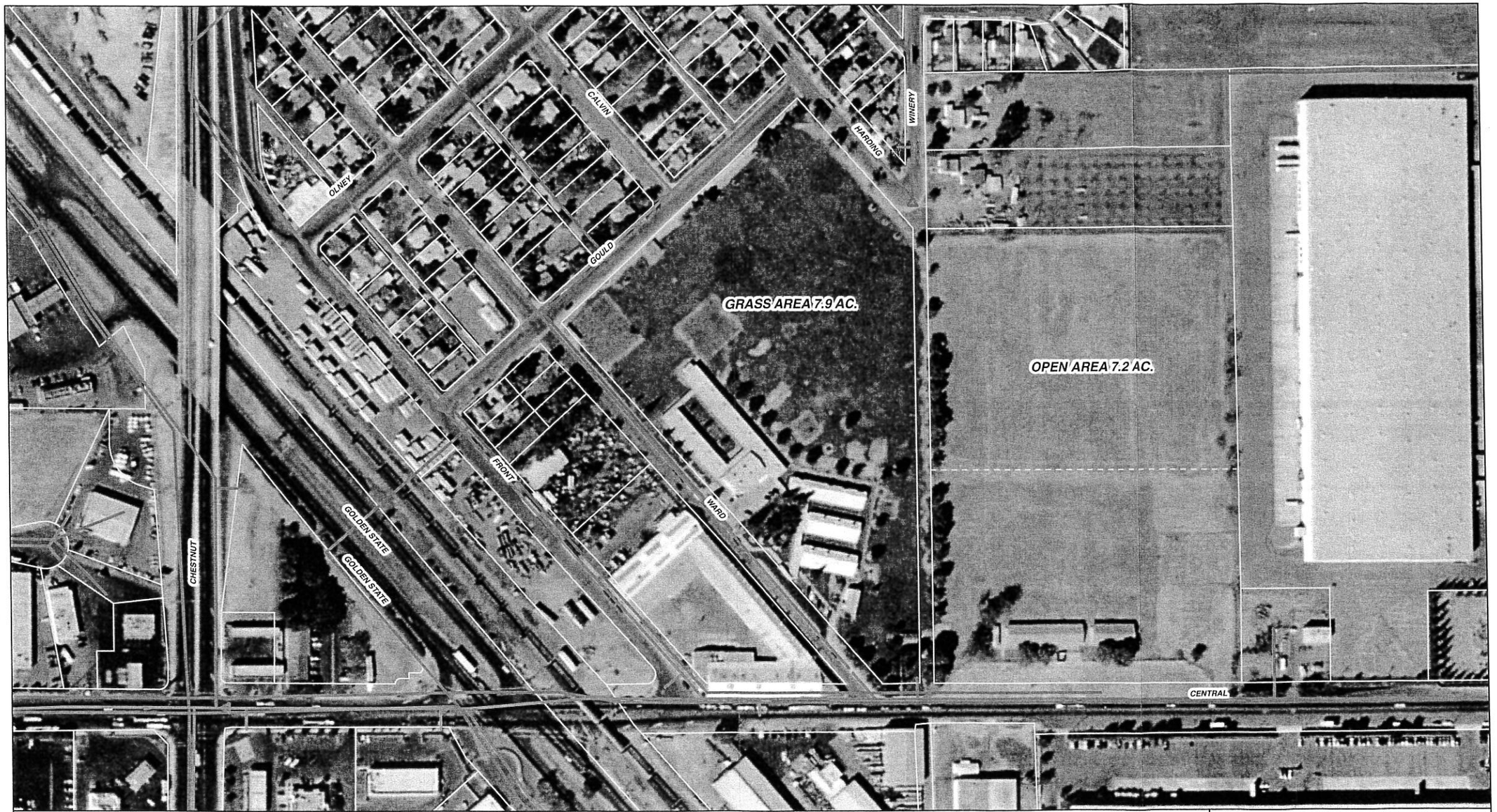
Legend

- Existing Water Main
- Existing Sewer Main
- Fresno County Parcel

Figure 7

Disposal Alternatives
Community Park Property
Malaga CWD

Photography by AirPhoto USA, 2007



0 100 200 Feet

EST. 1968
PROVOST & PRITCHARD
ENGINEERING GROUP
An Employee Owned Company

286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

Legend

Existing Water Main

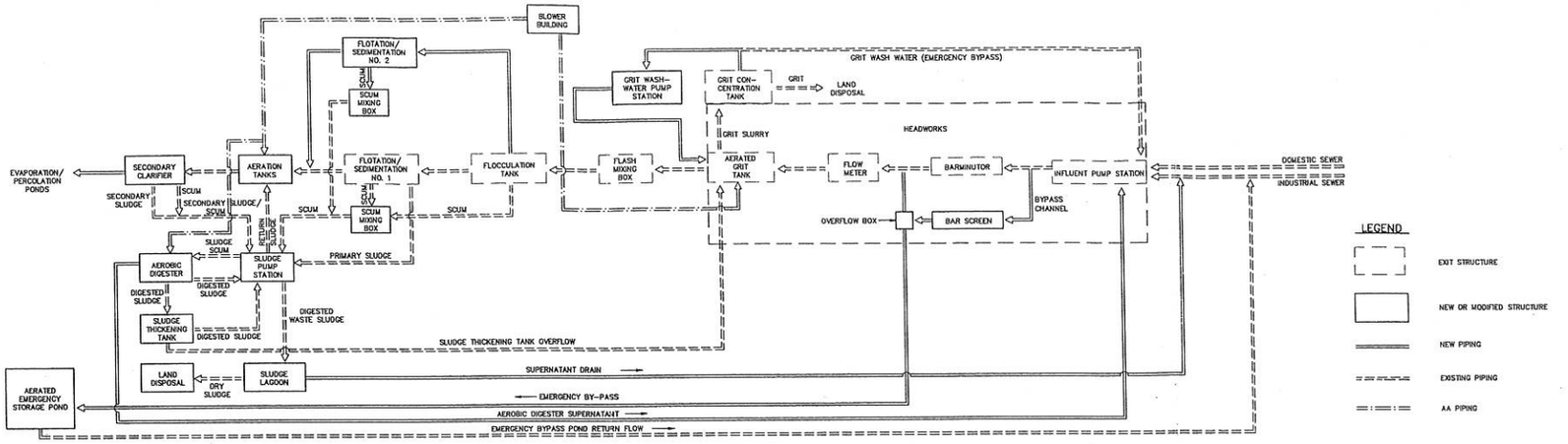
Existing Sewer Main

Fresno County Parcel

Figure 8

Disposal Alternatives
Konkel Property
Malaga CWD

Photography by AirPhoto USA, 2007



DESIGN CRITERIA

INFLUENT
FLOWRATE 1.65 MGD AVERAGE FLOW
3.00 MGD PEAK FLOW
BIOCHEMICAL OXYGEN DEMAND:——— 650 MG/L
SUSPENDED SOLIDS:——— 406 MG/L
TOTAL SOLIDS:——— 925 MG/L
OILS AND GREASE:——— 140 MG/L

EFFLUENT
BIOCHEMICAL OXYGEN DEMAND:——— 40 MG/L
SUSPENDED SOLIDS:——— 40 MG/L

HEADWORKS:	1.2 MGD PROPOSED FLOW
PUMP LIFT STATION	
30 INCH SCREW PUMPS, NUMBER	3
CAPACITY EACH, GPM X RPM	1100 X 64
HORSEPOWER, EACH	10
BARMINUTOR	
18 INCH BARMINUTOR, NUMBER	1
HORSEPOWER	2
FLOWMETER	
9" THROAT PARSHALL FLUME, NUMBER	1
CAPACITY, RANGE, MGD	.06 – 3.6
GRIT REMOVAL	
AERATED GRIT TANK, NUMBER	1
INDUSTRIAL GRIT TANK VOLUME, GALLONS	300
DOMESTIC GRIT TANK VOLUME, GALLONS + (NIS)	
DETENTION TIME AT PEAK FLOW, MINUTES	12
GRIT CONCENTRATION TANK, NUMBER	1
VOLUME OF TANK, GALLONS	970
12 INCH GRIT SCREW CONVEYOR, NUMBER	1
HORSEPOWER	1
PRIMARY SEDIMENTATION AND FLOTATION FACILITIES	
FLOCCULATION TANK	
FLOCCULATION MIXER, NUMBER	2
HORSEPOWER, EACH	1.25
FLOCCULATION PADDLE MIXER	1
HORSEPOWER, EACH	1.0
FLOCCULATION TANK VOLUME, GALLONS	13,600
AVERAGE DETENTION TIME, HOURS	0.33
FLOTATION/SEDIMENTATION	
FLOCCULATION/SEDIMENTATION TANK, NUMBER	2
DIAMETER X SIDEWATER DEPTH, FT X FT	42 X 9.25
SLUDGE COLLECTOR & SCUM SKIMMER DRIVE NUMBER X HORSEPOWER	2 X 3/4
VOLUME OF TANK, GALLONS, EACH	95,800
SURFACE AREA, SQ. FT., EACH	1,384
AVERAGE DETENTION TIME, HOURS	3.8
SURFACE OVERFLOW RATE, GPD/SQ. FT.	856
WEIR OVERFLOW RATE, GPD/FT.	4,000
9 INCH DIA. SCUM SCREW CONVEYOR, NUMBER	2
HORSEPOWER, EACH	2
SCUM MIXING TANK, NUMBER	1
VOLUME OF TANK, GALLONS, TOTAL	4,000
GREASE AND SCUM PUMP, NUMBER	2
CAPACITY, GPM X DISCHARGE HEAD, PSI	35 X 25
HORSEPOWER, EACH	3
DISSOLVED AIR FLOTATION EQUIPMENT	
RECYCLE PUMP, NUMBER	2
CAPACITY, GPM X TOTAL HEAD IN PSI	450 X 75
HORSEPOWER, EACH	30
AIR COMPRESSOR, NUMBER	2
CAPACITY, SCFM X DISCHARGE PRESSURE, PSI	7 X 100
HORSEPOWER, EACH	3
SATURATION TANK, NUMBER	2
VOLUME OF TANK, GALLONS, EACH	750

SECONDARY TREATMENT FACILITIES	1.2 MGD PROPOSED FLOW
AERATION TANK	
AERATION TANK, NUMBER	3
VOLUME OF TANK, TOTAL GALLONS	882,000
AVERAGE DETENTION TIME, HOURS	17.6
AERATION BLOWERS: NUMBER	4
HORSEPOWER, EACH X NUMBER	100 X 4
CAPACITY, SCFM X DISCHARGE PRESSURE PSI, EACH	1500 X 8
SECONDARY CLARIFIER	
NUMBER	2
LENGTH x WIDTH, FT. x FT., EACH	54 x 20.5
SIDEWATER DEPTH, FT, EACH	12.75
VOLUME OF CLARIFIER, EACH GALLON	105,800
SURFACE AREA, EACH, SQ. FT.	1,100
OVERFLOW RATE, GPD/SQ. FT.	1,090
HYDRAULIC DETENTION TIME, HOURS	4.2
RECTANGULAR CLARIFIER DIMENSIONS (1958)	
12 FT. X 54 FT. LONG X 11.25 FT.	
SIDEWATER DEPTH, NUMBER	1
VOLUME OF CLARIFIER, GALLONS	54,530
SURFACE AREA, SQ. FT.	702
OVERFLOW RATE, GPD/SQ. FT.	+ (NIS)
HYDRAULIC DETENTION TIME, HOURS	+ (NIS)
RECTANGULAR CLARIFIER DIMENSIONS (1959)	
12 FT. X 54 FT. X 8.08 FT.	
SIDEWATER DEPTH, NUMBER	1
VOLUME OF CLARIFIER, GALLON	39,160
SURFACE AREA, SQ. FT.	702
OVERFLOW RATE, GPD/SQ. FT.	+ (NIS)
HYDRAULIC DETENTION TIME, HOURS	+ (NIS)
SLUDGE PUMP PIT	
RETURN ACTIVATED SLUDGE PUMP, NUMBER	3
CAPACITY, EACH, GPM X TOTAL HEAD	400 x 50
HORSEPOWER, EACH	10
PRIMARY SLUDGE PUMP, NUMBER	1
CAPACITY GPM X TOTAL HEAD, FT.	400 X 50
HORSEPOWER	10
SLUDGE DRAINOFF PUMP, NUMBER	1
CAPACITY, GPM X TOTAL HEAD, FT.	400 X 50
HORSEPOWER	10

+ (NIS) – NOT IN SERVICE

SOLIDS HANDLING FACILITIES	1.2 MGD PROPOSED FLOW
AEROBIC DIGESTERS	
RECTANGULAR DIGESTER	
NUMBER	2
LENGTH x WIDTH, FT. x FT., EACH	54 x 28
SIDEWATER DEPTH, FT, EACH	13.5
VOLUME OF TANK, GALLONS, EACH	152,600
SLUDGE THICKENING TANK	
NUMBER	1
LENGTH x WIDTH, FT. x FT.	32 x 12
SIDEWATER DEPTH, FT	9.5
VOLUME OF TANK, GALLONS	23,200
SLUDGE LAGOONS (DRYING BEDS)	
NUMBER OF DRYING BEDS	3
AREA OF DRYING BEDS, SQ. FT.	30,000
EFFLUENT DISPOSAL	
EVAPORATION/PERCOLATION PONDS	
NUMBER OF PONDS	8
TOTAL SURFACE AREA, ACRES	21.66
MAXIMUM WATER DEPTH, FT.	8
MINIMUM WATER DEPTH, FT.	3
TOTAL VOLUME OF PONDS, ACRE-FEET (8 FT.)	173.28
EMERGENCY STORAGE POND	
NUMBER OF PONDS	1
TOTAL SURFACE AREA, ACRES	1.24
MAXIMUM WATER DEPTH, FT.	8
MINIMUM WATER DEPTH, FT.	3
TOTAL VOLUME OF POND, ACRE-FEET (8 FT.)	9.92
POND AERATION	
FLOATING AERATOR, NUMBER	6
HORSEPOWER, EACH	5.0

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REGISTERED PROFESSIONAL ENGINEER — DARNELL G. JACKSON — NO. 39981 — CIVIL ENGINEER — STATE OF CALIFORNIA
EXP 12-31-97

EDA AWARD No. 07-01-04039

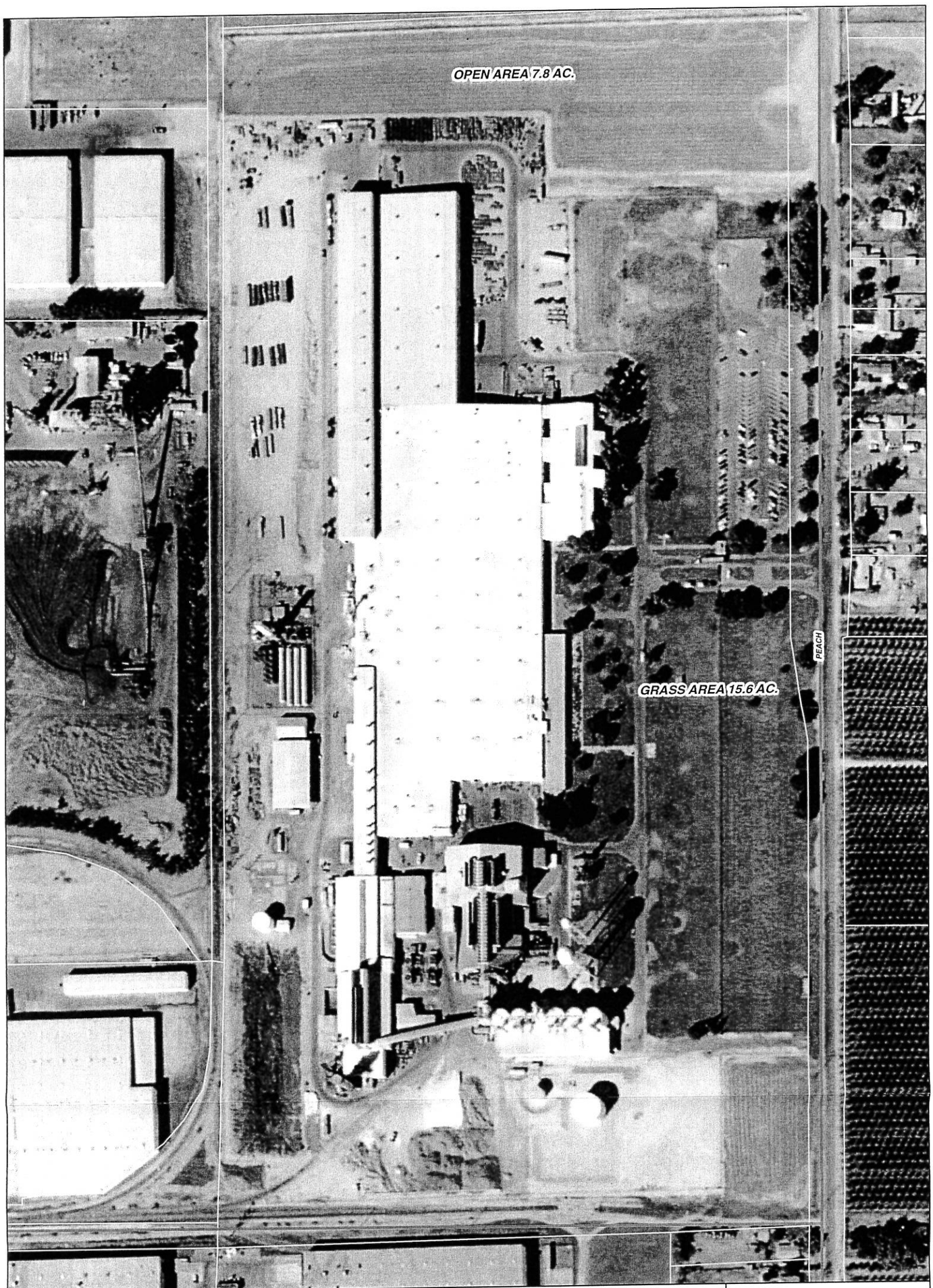
MALAGA COUNTY WATER DISTRICT
3580 SOUTH FRANK STREET, FRESNO, CALIFORNIA 93725
PHONE (209) 485-7353 FAX (209) 485-7319

CONSTRUCTION OF WATER & SEWER IMPROVEMENTS
PROCESS SHEET AND DESIGN CRITERIA

PROVOST & PRITCHARD ENGINEERING GROUP
286 WEST CROMWELL AVENUE
FRESNO, CALIFORNIA 93711-6162
209/449-2700 FAX 209/449-2715

DESIGN ENGINEER _____
DATE _____ C.E. LICENSE NO. _____
Job No. 9510101-612
Dwg. No. 95-0160
Date Revised
Approval

SCALE: AS SHOWN
DRAWN BY: D. WILSON
REVISED: 08-12-94, 01-03-95, 01-06-95, 01-10-95
SHEET 15 OF 62 SHEETS



0 100 200 Feet

EST. 1968
PROVOST & PRITCHARD
ENGINEERING GROUP
An Employee Owned Company

286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

Legend

Existing Water Main

Existing Sewer Main

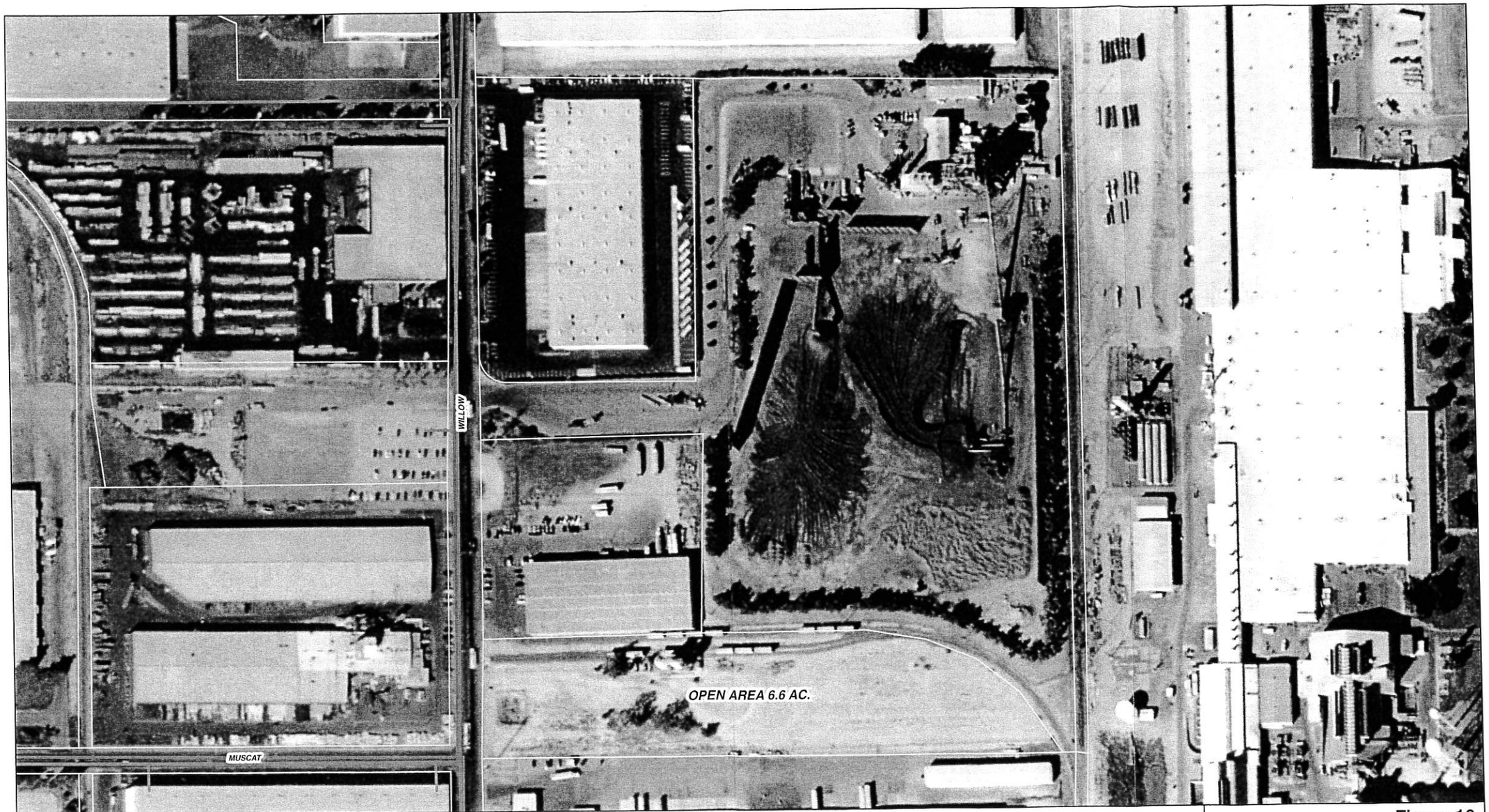
Fresno County Parcel

Figure 9

Disposal Alternatives
PPG Property
Malaga CWD

Photography by AirPhoto USA, 2007

7/14/2008 \\pineflat\dwg_dgn\Clients\Malaga CWD - 1057\1057OG01_Ongoing\GIS\2008 PROJECTS\Map\400\Disposal Alt-PPG.mxd



0 100 200 Feet

EST. 1968
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An Employee Owned Company
286 W. Cromwell Ave.
Fresno, CA 93711-6162
(559) 449-2700

Legend

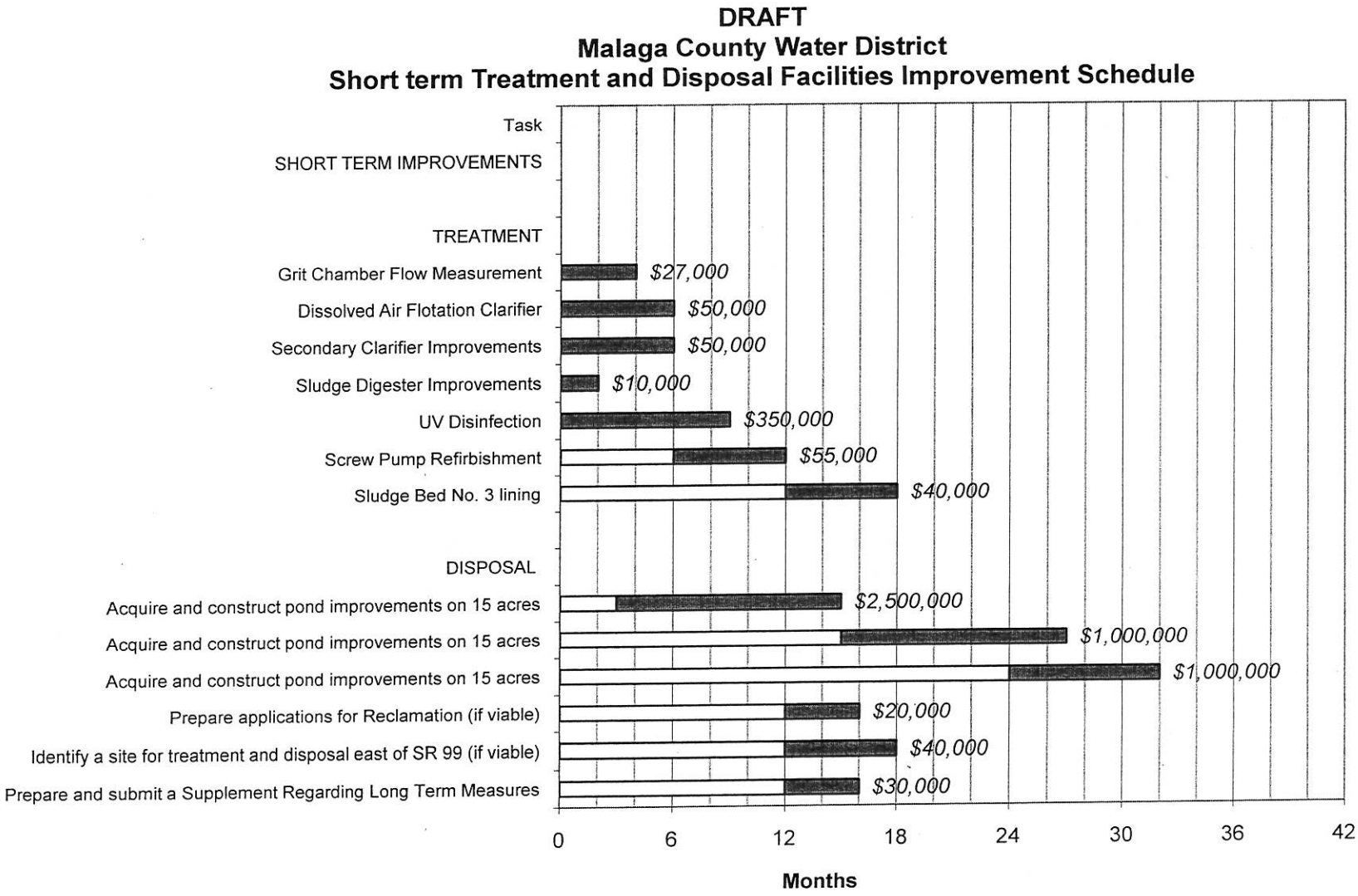
- Existing Water Main
- Existing Sewer Main
- Fresno County Parcel

Figure 10

Disposal Alternatives
Rio Bravo Property
Malaga CWD

Photography by AirPhoto USA, 2007

FIGURE 11



G:\Clients\Malaga CWD - 1057\1057OG01_Ongoing\400\RWQCB Correspondence\2008\Treatment_Disposal Capacity\short term improvement Schedule

]

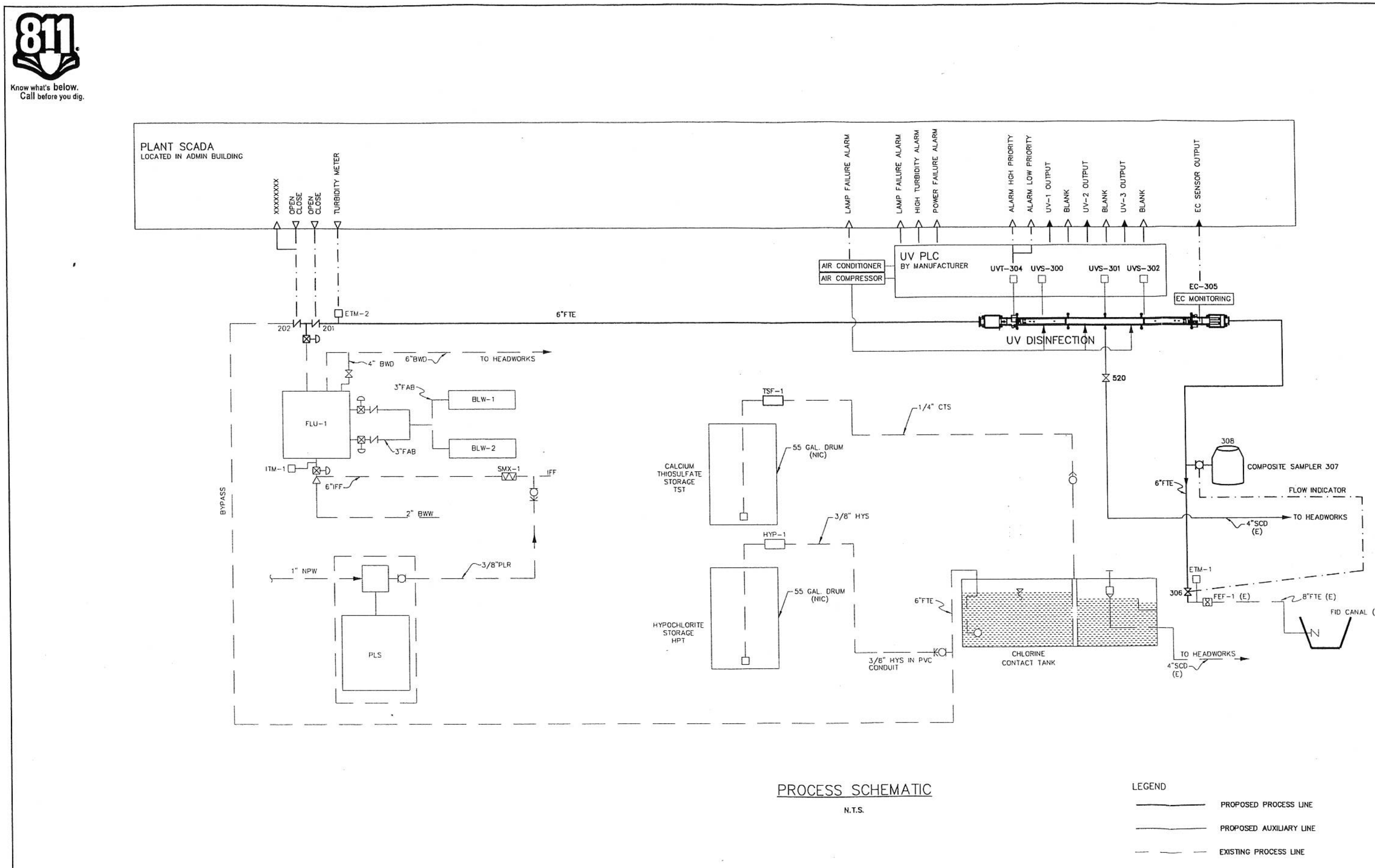
APPENDIX

APPENDIX B

Master Plan of Wastewater Treatment Facilities

APPENDIX C

Preliminary Opinion of Cost for Disposal Facilities



811
Know what's below. Call before you dig.
PLANT SCADA
LOCATED IN ADMIN BUILDING
XXXXXXXX
OPEN CLOSE
OPEN CLOSE
TURBIDITY METER
LAMP FAILURE ALARM
LAMP FAILURE ALARM
HIGH TURBIDITY ALARM
POWER FAILURE ALARM
ALARM HIGH PRIORITY
ALARM LOW PRIORITY
UV-1 OUTPUT
BLANK
UV-2 OUTPUT
BLANK
UV-3 OUTPUT
BLANK
EC SENSOR OUTPUT
AIR CONDITIONER
AIR COMPRESSOR
UV PLC
BY MANUFACTURER
UVT-304
UVS-300
UVS-301
UVS-302
EC-305
EC MONITORING
ETM-2
6"FTE
202
201
UV DISINFECTION
520
4" BWD
6"BWD
TO HEADWORKS
3"FAB
BLW-1
BLW-2
FLU-1
3"FAB
ITM-1
6"IFF
SMX-1
IFF
2" BWW
BYPASS
1" NPW
3/8"PLR
PLS
TSF-1
1/4" CTS
CALCIUM THIOSULFATE STORAGE TST
55 GAL. DRUM (NIC)
3/8" HYS
HYP-1
HYPOCHLORITE STORAGE HPT
55 GAL. DRUM (NIC)
3/8" HYS IN PVC CONDUIT
6"FTE
CHLORINE CONTACT TANK
TO HEADWORKS
4"SCD (E)
308
COMPOSITE SAMPLER 307
6"FTE
FLOW INDICATOR
TO HEADWORKS
4"SCD (E)
ETM-1
306
FEF-1 (E)
8"FTE (E)
FID CANAL (E)
LEGEND
PROPOSED PROCESS LINE
PROPOSED AUXILIARY LINE
EXISTING PROCESS LINE

PROCESS SCHEMATIC

N.T.S.

PRELIMINARY
NOT FOR CONSTRUCTION
01/03/2007

No.	REVISION	BY	DATE

MALAGA WWTP MODIFICATIONS
WASTEWATER TREATMENT PLANT
MALAGA COUNTY WATER DISTRICT
FRESNO COUNTY

UV DISINFECTION

PROCESS AND INSTRUMENTATION

EST. 1968
PROVOST & PRITCHARD
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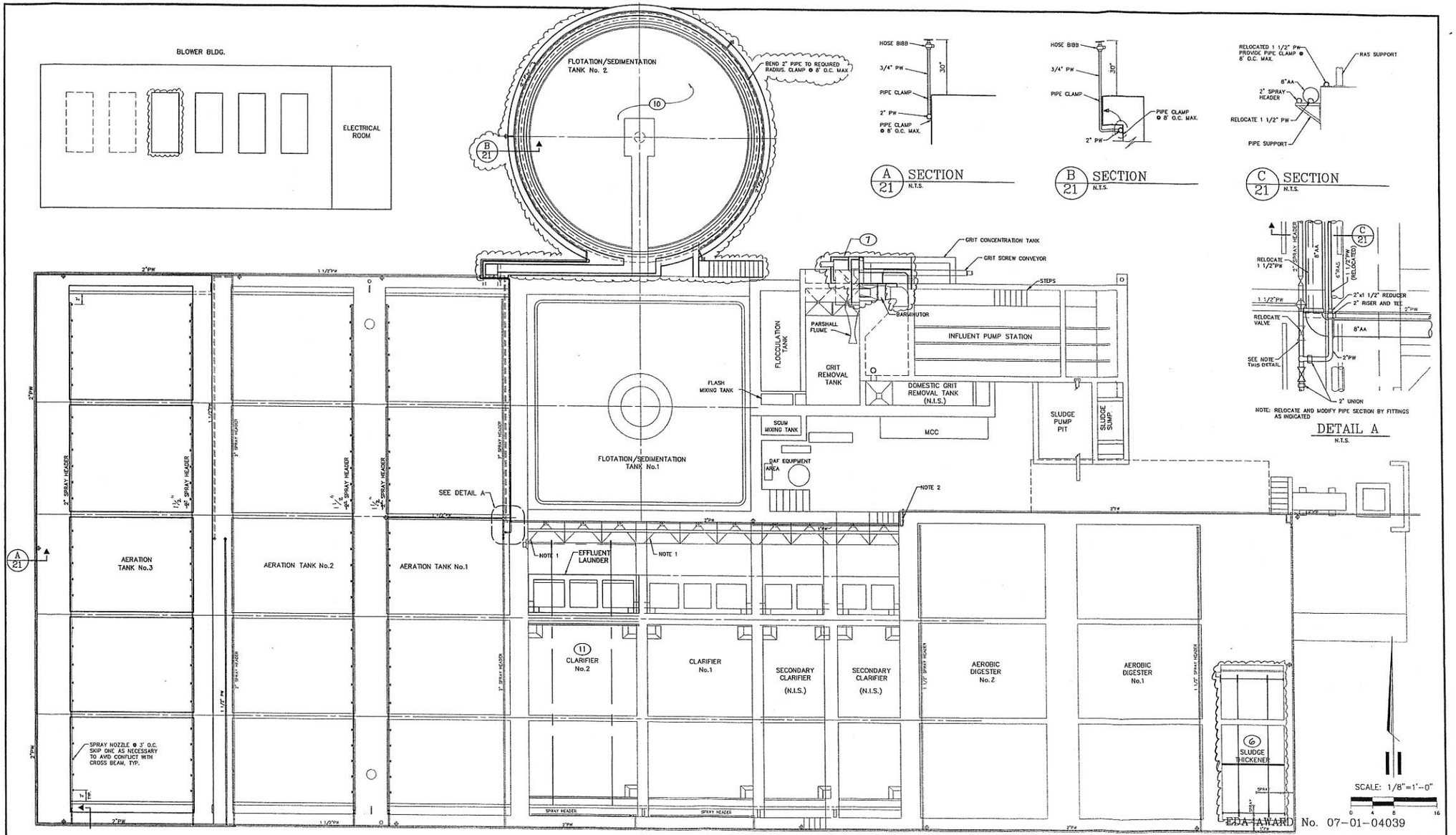
FRESNO, CALIFORNIA 93711-6162
559/449-2700 FAX 559/449-2715
www.ppeng.com

DESIGN ENGINEER: MICHAEL TAYLOR
LICENSE NO.:
DRAFTED BY: DWM
CHECKED BY:
SCALE: AS SHOWN
DATE: 2-14-2006
JOB NO: 10570802
DWG. NO:



EDA AWARD No. 07-01-04039

LEGEND

	EXISTING	NEW
WATER LINES		
HOSE BIBB	⊕	⊕
GATE VALVES	⋈	⋈
SPRAY NOZZLE		▸

NOTES:
1. MODIFY AND REROUT ELECT CONDUIT TO CLARIFIER DRIVES TO CROSS ABOVE 8"AA PIPING.
2. MODIFY AND REROUT 1" PW AS REQUIRED TO CLEAR WAY FOR NEW 8" AA UNDER CONC. STEPS.

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DATE 4-7-99
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EXP (2.01.97)

MALAGA COUNTY WATER DISTRICT
3580 SOUTH FRANK STREET, FRESNO, CALIFORNIA 93725
PHONE (209) 485-7353 FAX (209) 485-7319

CONSTRUCTION OF WATER & SEWER IMPROVEMENTS
PLANT WATER PIPING, SECTIONS & DETAILS

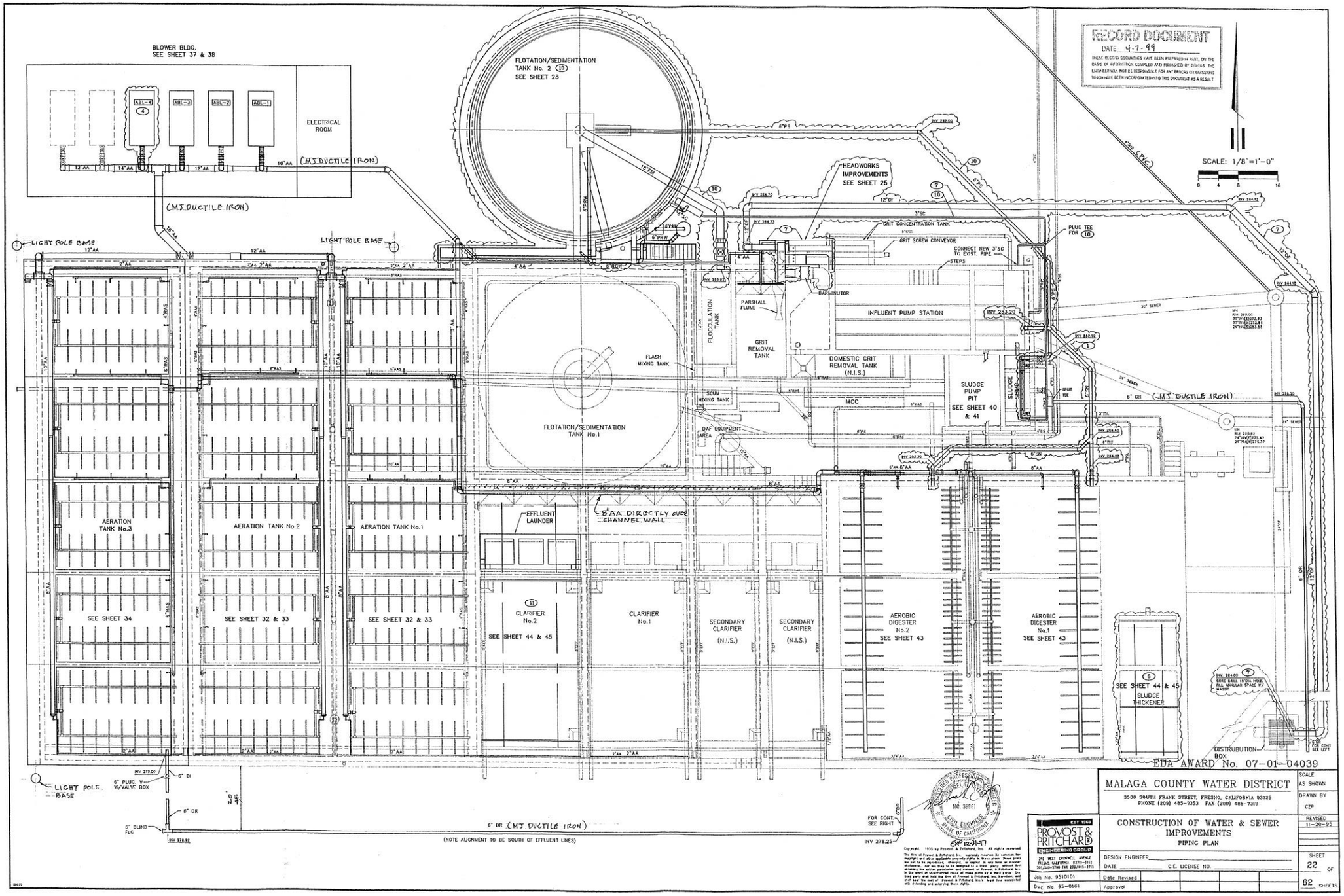
SCALE: AS SHOWN
DRAWN BY: CZP
REVISED: 11-20-95

DESIGN ENGINEER
DATE C.E. LICENSE NO.
Date Revised
Approval

SHEET 21 OF 62 SHEETS

PROVOST & PRITCHARD ENGINEERING GROUP
301 WEST OKONOGLI AVENUE
FRESNO, CALIFORNIA 93711-6162
209/448-2700 FAX 209/449-2715

Job No. 9510101
Dwg. No. 95-0161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SCALE: 1/8"=1'-0"
BLOWER BLDG.
SEE SHEET 37 & 38
ELECTRICAL ROOM
FLOTATION/SEDIMENTATION TANK No. 2 (10)
SEE SHEET 28
HEADWORKS IMPROVEMENTS
SEE SHEET 25
(M.J. DUCTILE IRON)
LIGHT POLE BASE
GRIT CONCENTRATION TANK
GRIT SCREW CONVEYOR
CONNECT NEW 3"SC TO EXIST. PIPE
STEPS
PLUG TEE FOR (10)
BARMINUTOR
PARSHALL FLUME
INFLUENT PUMP STATION
FLOCCULATION TANK
GRIT REMOVAL TANK
DOMESTIC GRIT REMOVAL TANK (N.I.S.)
FLASH MIXING TANK
SCUM MIXING TANK
MCC
SLUDGE PUMP PIT
SEE SHEET 40 & 41
SPLIT TEE
FLOTATION/SEDIMENTATION TANK No.1
DAF EQUIPMENT AREA
AERATION TANK No.3
AERATION TANK No.2
AERATION TANK No.1
SEE SHEET 34
SEE SHEET 32 & 33
SEE SHEET 32 & 33
EFFLUENT LAUNDER
8"AA DIRECTLY OVER CHANNEL WALL
CLARIFIER No.2
SEE SHEET 44 & 45
CLARIFIER No.1
SECONDARY CLARIFIER (N.I.S.)
SECONDARY CLARIFIER (N.I.S.)
AEROBIC DIGESTER No.2
SEE SHEET 43
AEROBIC DIGESTER No.1
SEE SHEET 43
SEE SHEET 44 & 45
SLUDGE THICKENER
DISTRUBUTION BOX
CORE DRILL 18"DIA HOLE, FILL ANNULAR SPACE W/ MASTIC
LIGHT POLE BASE
6" PLUG V W/VALVE BOX
6" BLIND FLG
6" DR (M.J. DUCTILE IRON)
(NOTE ALIGNMENT TO BE SOUTH OF EFFLUENT LINES)
FOR CONT. SEE RIGHT
FOR CONT SEE LEFT
EDA AWARD No. 07-01-04039
REGISTERED PROFESSIONAL ENGINEER NO. 38061 CIVIL STATE OF CALIFORNIA
EXP 12-31-97
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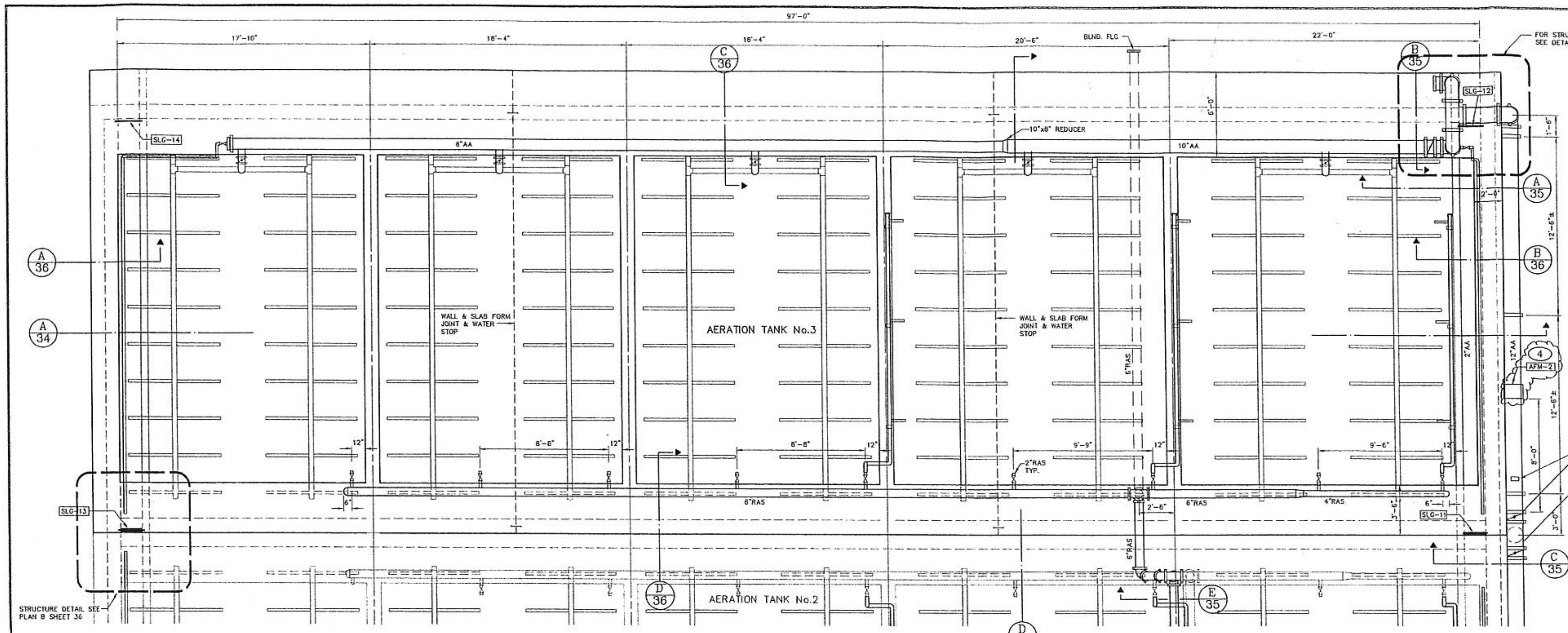
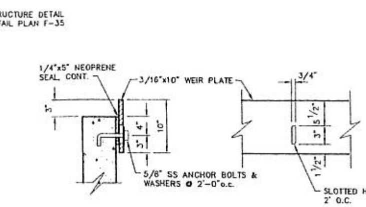
MALAGA COUNTY WATER DISTRICT
3580 SOUTH FRANK STREET, FRESNO, CALIFORNIA 93725
PHONE (209) 485-7353 FAX (209) 485-7319
SCALE AS SHOWN
DRAWN BY CZP
REVISED 11-20-95
CONSTRUCTION OF WATER & SEWER IMPROVEMENTS
PIPING PLAN
DESIGN ENGINEER
DATE C.E. LICENSE NO.
Job No. 95101D1
Dwg. No. 95-0161
Date Revised
Approved
SHEET 22 OF 62 SHEETS
EST 1956 PROVOST & PRITCHARD ENGINEERING GROUP
776 WEST GRONDELL AVENUE, VISALIA, CALIFORNIA 93291-0161
209/636-1166 FAX 209/651-1771



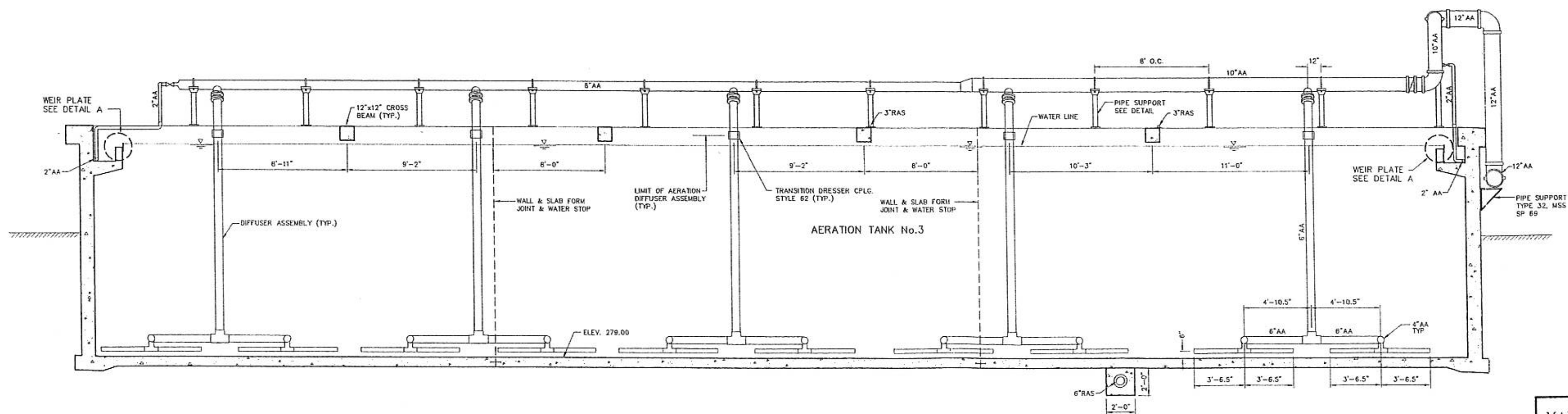
97'-0"
17'-10"
18'-4"
18'-4"
20'-6"
22'-0"
BLND. FLG
FOR STRUCTURE DETAIL SEE DETAIL PLAN F-35
SLG-14
SLG-13
SLG-12
SLG-11
8"AA
10"AA
10"x8" REDUCER
WALL & SLAB FORM JOINT & WATER STOP
AERATION TANK No.3
AERATION TANK No.2
6"RAS
4"RAS
2"RAS TYP.
2"AA
12"AA
AFM-2
STRUCTURE DETAIL SEE PLAN B SHEET 36

PLAN
1/4"=1'-0"



DETAIL A
1/2"=1'-0"

NOTE: INFLUENT WEIR ON INTERIOR FACE OF CHANNEL AND EFFLUENT WEIR ON EXTERIOR FACE OF CHANNEL. RAS DISTIBUTOR PIPE NOT SHOWN.



WEIR PLATE SEE DETAIL A
8"AA
10"AA
12"AA
12"x12" CROSS BEAM (TYP.)
3"RAS
PIPE SUPPORT SEE DETAIL
WATER LINE
8' O.C.
DIFFUSER ASSEMBLY (TYP.)
WALL & SLAB FORM JOINT & WATER STOP
LIMIT OF AERATION DIFFUSER ASSEMBLY (TYP.)
TRANSITION DRESSER CPLG. STYLE 62 (TYP.)
AERATION TANK No.3
ELEV. 278.00
PIPE SUPPORT TYPE 32, MSS SP 69
6"RAS
4"AA TYP

A/33 A/34 SECTION
1/4"=1'-0"

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NOTE: SEE SPECIFICATIONS FOR ACCEPTABLE ALTERNATE DIFFUSERS.

SCALE 1/4"=1'-0"
0 2 4 8

EDA AWARD No. 07-01-04039

No. 38961 CIVIL ENGINEER STATE OF CALIFORNIA
exp 12-31-97

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PROVOST & PRITCHARD
ENGINEERING GROUP
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FRESNO, CALIFORNIA 93711-6162
209/449-2700 FAX 209/449-2715

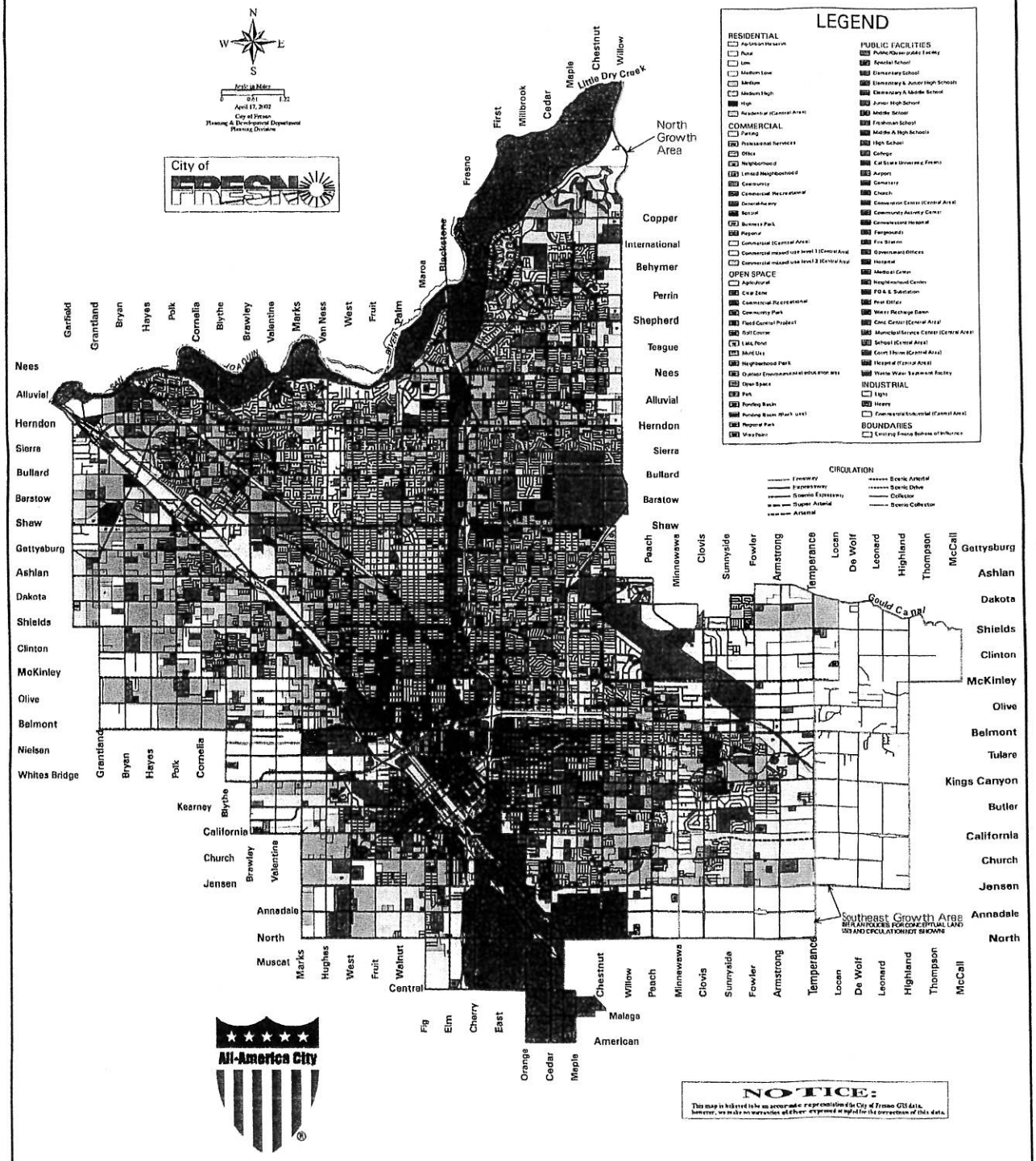
MALAGA COUNTY WATER DISTRICT 3580 SOUTH FRANK STREET, FRESNO, CALIFORNIA 93725 PHONE (209) 485-7353 FAX (209) 485-7319					SCALE AS SHOWN DRAWN BY: CZP
CONSTRUCTION OF WATER & SEWER IMPROVEMENTS WWTP- AERATION TANK PLAN & SECTIONS					REVISED
DESIGN ENGINEER DATE C.E. LICENSE NO.					SHEET 34 OF 62 SHEETS
Job No. 9510101	Date Revised				
Dwg. No. 95-0182	Approval				

APPENDIX A

Design Criteria Summary

EXHIBIT 4

2025 Fresno General Plan Land Use and Circulation Map



FIGURES

APPENDIX C

Preliminary Opinion of Cost for Disposal Facilities

TABLE 12

Malaga County Water District
Potential Disposal Sites

APN	Owner	Total Acreage	Pond Acreage
330 031 60S	Southern Pacific Pipe	13.8	10.9
330 031 42S	Southern Pacific Pipe	12.8	10.4
330 031 11	Sargenti	4.34	3.7
330 031 46S	Parnagian	53.7	33.0
330 031 45	Parnagian	27.9	24.0
330 021 20	Raco	18.4	13.5
330 021 18	TRICOZ	13.3	11.0

Treatment Plant Capacity	0.8 MGD	1.2 MGD	1.65 MGD
Additional Disposal Pond Acreage	13.25	27.25	43.00

Malaga County Water District

PRELIMINARY Estimate for Disposal Pond Expansion
February, 2008

				Located in Maple Avenue		Located in Easements East of Maple		Located in Easements Adjacent to Railroad Tracks	
Property	APN 330 031 42S	$ 20,000	per Ac	12.8 Ac	$ 256,000	12.8 Ac	$ 256,000	12.8 Ac	$ 256,000
Easements									
	Permanent	$ 20,000	per Ac	0.1 Ac	$ 2,755	0.6 Ac	$ 12,000	0.5 Ac	$ 10,000
	Construction	$ 10,000	per Ac	0 Ac	$ -	0.6 Ac	$ 6,000	1.0 Ac	$ 10,000
Fencing		$ 15	LF	3000 LF	$ 45,000	3000 LF	$ 45,000	3000 LF	$ 45,000
Pond Construction (Earthwork) (15100 CY Off Haul)		$ 8	CY	42000 CY	$ 336,000	42000 CY	$ 336,000	42000 CY	$ 336,000
Piping to Property (Gravity Main)		$ 90	LF	3150 LF	$ 283,500	3150 LF	$ 283,500	3535 LF	$ 318,150
	On WWTP Site			600		600		1400	
	Off WWTP Site			2550		2550		2135	
Jack & Bore		$ 350	LF	150 LF	$ 52,500	150 LF	$ 52,500	75 LF	$ 26,250
Lift Station				LS	$ 125,000	LS	$ 125,000	LS	$ 125,000
Gravel Surfacing				LS	$ 100,000	LS	$ 100,000	LS	$ 100,000
Trench Resurfacing		$ 25	LF	2400 LF	$ 60,000	300 LF	$ 7,500	50 LF	$ 1,250
Electrical and Controls				LS	$ 200,000	LS	$ 200,000	LS	$ 200,000
Traffic Control				LS	$ 150,000	LS	$ 100,000	LS	$ 50,000
Environmental				LS	$ 50,000	LS	$ 50,000	LS	$ 50,000
Planning				LS	$ 50,000	LS	$ 50,000	LS	$ 50,000
Permitting				LS	$ 50,000	LS	$ 50,000	LS	$ 50,000
Design and Construction Review				LS	$ 300,000	LS	$ 300,000	LS	$ 300,000
Subtotal					$ 2,060,755		$ 1,973,500		$ 1,927,650
Contingencies (30%)					$ 618,226		$ 592,050		$ 578,295
Total					$ 2,678,981		$ 2,565,550		$ 2,505,945

Note: This preliminary estimate is applicable only for APN 330 031 42S and does not include APN 330-031-60S, APN 330-031-45S, APN 330-031-46S, APN 330-211-20, or APN 330-211-18, and is dependent on the property owners willingness to move forward. APN 330-031-42S could provide 10.5 acres of additional pond disposal, about 25% of the additional disposal area required for the ultimate 1.65 MGD capacity of the WWTP.