Title 22

CALAVERAS COUNTY WATER DISTRICT

PRODUCTION, DISTRIBUTION AND USE ENGINEERING REPORT FOR NEW HOGAN / LA CONTENTA WASTEWATER TREATMENT PLANT AND LA CONTENTA GOLF COURSE

PREPARED FOR THE

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
AND
DEPARTMENT OF HEALTH SERVICES

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Prepared by

ECO:LOGIC ENGINEERING
3875 ATHERTON ROAD, SUITE 1
ROCKLIN, CA 95765

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SECTION 1 INTRODUCTION

1.1 PURPOSE OF REPORT

This report is being submitted to State of California Department of Health Services (DHS) and California Central valley Regional Water Quality Control Board (RWQCB) to describe the production, distribution and use of recycled water for the New Hogan / La Contenta Wastewater Treatment Plant (WWTP) per requirements of Title 22 of the California Code of Regulations and Cleanup and Abatement Order #R5-2002-0712.

1.2 DESCRIPTION OF PROJECT

The Calaveras County Water District (CCWD) provides wastewater service to the New Hogan / La Contenta area within Calaveras County. The service area includes the La Contenta subdivision and golf course, the surrounding area contained within CCWD Assessment District 604, and adjacent residential and commercial development. District facilities include wastewater collection, treatment, effluent storage and effluent reclamation on the LA Contenta Golf Course which has only limited restriction on aceess. The construction of the New Hogan / La Contenta WWTP in 1991 was financed by formation of an assessment district, AD 604.

New Hogan / La Contenta WWTP provides tertiary recycled water as defined by Title 22 of the California Code of Regulations reclamation criteria. The WWTP liquid process train consists of a mechanically cleaned bar screen, an activated sludge basin, secondary clarifier, coagulant feed sand filters, and chlorine disinfection. The effluent is stored during the wet season in two storage reservoirs, and reused as irrigation water on the La Contenta Golf Course as needed at agronomic rates.

The WWTP is currently permitted under the Waste Discharge Requirements Order No. 95-177. The permit allows for treatment, storage and disposal of 0.17 million gallons per day (MGD) on an average dry weather flow (ADWF) basis.

The CCWD is in the process of increasing the WWTP storage capacity by expanding the storage capacity. To document this change in storage plus improvements to WWTP monitoring, alarm and redundancy features, the CCWD submitted a Report of Waste Discharge to the RWQCB and this Engineering Report to the DHS and RWQCB for the upgraded facility. The changes in storage are scheduled to be completed in November of 2002. Additional treatment plant improvements are planned for the fiscal year 2003/04.

Following is a description of the proposed treatment facilities, use area, and irrigation system for the New Hogan / La Contenta WWTP. The report is organized, for ease of review, in accordance with the March 2001 DOHS "Guidelines for the Preparation of an Engineering Report for the Production, Distribution, and Use of Recycled Water."

SECTION 2 RECYCLE WATER PROJECT

2.1 GENERAL

The New Hogan / La Contenta WWTP, including two effluent storage reservoirs, is owned and operated by CCWD. The reclamation site, i.e. La Contenta Golf Course, is owned and operated by La Contenta Investors. Both entities are named in Order 95-177. In addition, an agreement between CCWD and La Contenta Investors exisits that specifies the conditions and responsibilities associated with effluent reclamation via irrigation of the golf course. In the foreseeable future, CCWD will continue to own and operate the WWTP and storage reservoirs. La Contenta Investors will continue to own and operate the golf course.

2.2 RULES AND REGULATIONS

Project specific rules applicable to the treatment facility and use area are outlined herein in Section 2.8 - Monitoring and Reporting, and Section 4.9 - Employee Training. In addition, Section 4.7 presents rules regarding cross-connection control at the use area.

2.3 PRODUCER – DISTRIBUTOR – USER

CCWD owns, maintains and operates the New Hogan /La Contenta WWTP and storage of effluent in the two associated effluent storage reservoirs. The CCWD is also responsible for the delivery of the effluent to the La Contenta golf course, specifically to the golf course irrigation pump station. La Contenta Investors is the user of the effluent and is responsible for the application of the effluent and maintenance of the irrigation system and use areas.

2.4 RAW WASTEWATER

The service area for the New Hogan / La Contenta WWTP includes the La Contenta subdivision that currently has approximately 540 equivalent single-family units (ESFUs) and a public golf course that encompasses approximately 128 acres. It is anticipated that ultimate build-out of the La Contenta subdivision and the Assessment District 604 (AD 604) will result in 2,294 ESFUs. The AD 604 was formed in 1991 to finance the construction of the New Hogan / La Contenta sewer collection system and the initial phase of the WWTP. Development of the proposed subdivisions, inclusing proposed subdivisions outside of the current service area, will increase the total number of ESFUs to 2,808.

A summary of current influent wastewater characteristics is presented in Table 1.

Table 1
Raw Wastewater Quantity and Quality[1]

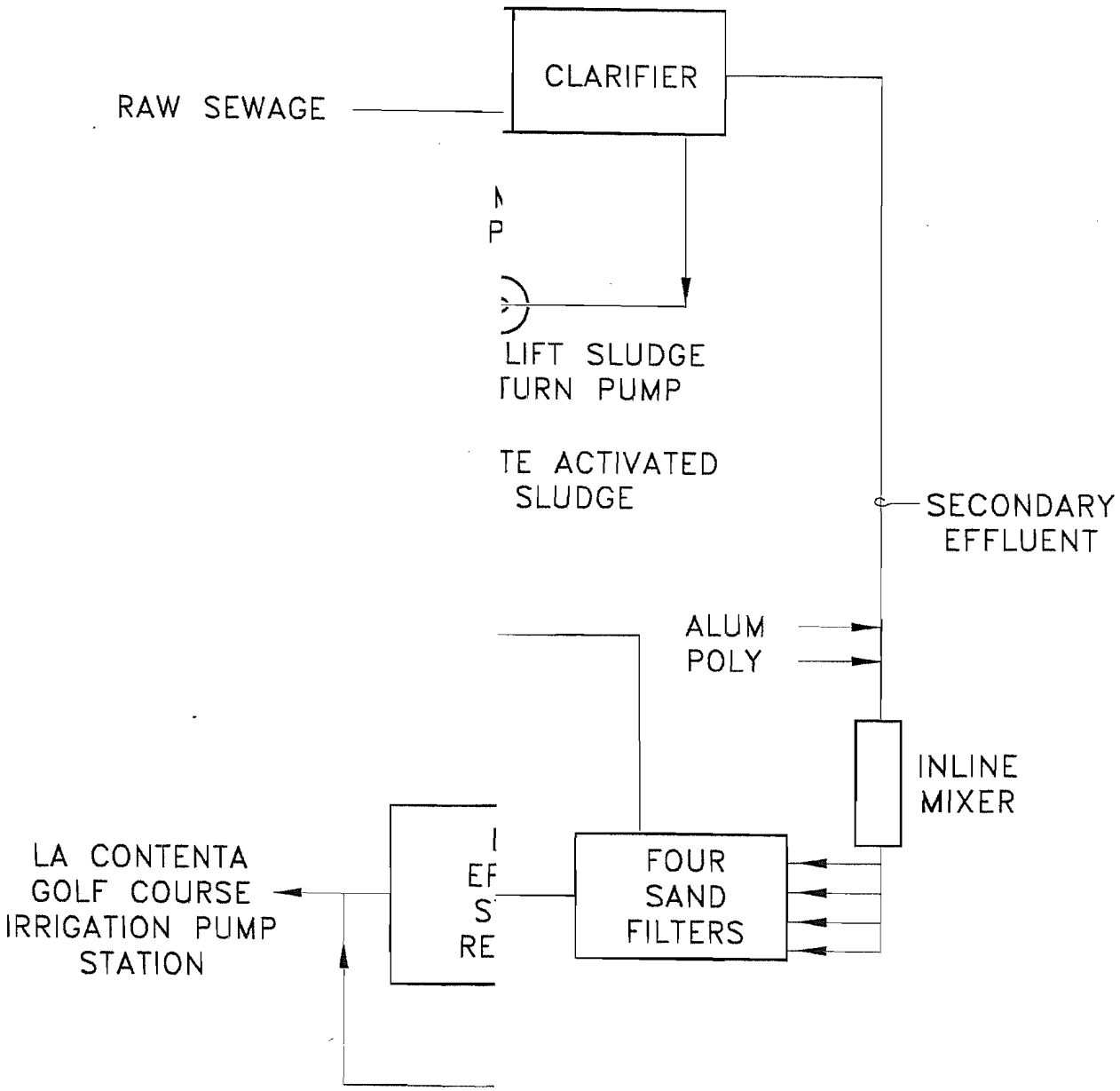
Influent Flow (Mgal/d)	
Average Dry Weather (ADWF)	0.11
Average Annual (AAF)	0.118
Peak Month	0.149
Peak Day	0.403
Influent Constituent Concentrations (mg/l)[2]	
BOD_5[3] range	42-357
TSS range	36-334
BOD_5 median	188
TSS median	147
BOD_5 95th percentile	252
TSS 95th percentile	262

[1] Based on 2001 data.
[2] Based on grab samples.
[3] 5-Day, 20°C biochemical oxygen demand.

2.5 TREATMENT PROCESS

A schematic of the treatment process is presented in Figure 1. The major system facilities include the following:

- Influent Monitoring,
- Influent Screening,
- Nitrifying Activated Sludge Treatment,
- Tertiary Filtration,
- Disinfection System,
- Effluent Monitoring,
- Sludge Handling,
- Effluent Return Pumping
- Electrical System,
- Effluent Storage and Disposal Facilities.


CLARIFIER
RAW SEWAGE
LIFT SLUDGE
TURN PUMP
SECONDARY
EFFLUENT
ALUM
POLY
INLINE
MIXER
FOUR
SAND
FILTERS
LA CONTENTA
GOLF COURSE
IRRIGATION PUMP
STATION

Influent Monitoring

Flow meter located at the main sewage pump station measures treatment plant influent flows. The meter is read daily by the WWTP staff. In addition to the flow measurements, monthly grab samples of influent wastewater are analyzed for Biological Oxygen Demand (BOD_5) and Suspend Solids. The samples are collected manually at the headworks during the on cycles of the main sewage pump station.

Influent Screening

Raw wastewater influent to the WWTP is continuously screened to remove coarse debris and floatable material that might otherwise foul downstream process equipment or accumulate in the aeration basin. Screening facilities are located under the breezeway of the operation building where screenings can temporarily accumulate in a weather protected area. Screening facilities consist of the following:

- A 12-inch AquaGuard mechanical screen, with 15 mm (5/8-inch) maximum clear openings, with direct discharge of screenings into a wheelbarrow.
- A fixed bar rack with 1/2-inch clear openings, in an 18-inch bypass channel that serves as backup to the mechanical screen.
- 18- to 24-inch screening channel width, 18-inch maximum water depth, with 12-inch inlet and outlet piping.

The design capacity of the mechanical screen itself is over 4 MGD and is theoretically ample for projected system peak flows. However, channel inlet and outlet design limits the effective depth of flow and headloss through the screen, therefore its in-place operating capacity is less than the 2.4 MGD system peak flow.

Nitrifying Activated Sludge Treatment

Biological treatment of wastewater organics (i.e. BOD) is accomplished in the activated sludge treatment process. Process components at the New Hogan/La Contenta WWTP include a 500,000 gallon concrete lined aeration basin with air blower and diffuser system, a clarifier compartment integral to the aeration basin, and an airlift return and waste sludge pump system. Process design and structure configurations are part of the proprietary Biolac treatment system manufactured by Parkson Corporation.

With a theoretical hydraulic detention time of 30 hours at design 0.4 MGD ADWF, the activated sludge process operates in the extended aeration mode, which is characteristically stable and reliable in achieving a 90 to 95 percent reduction of the influent BOD. Bacterial growth, the utilization of suspended organic material, and the reduction of BOD occurs in the mixed aerobic environment maintained in the aeration basin. Bacterial solids are subsequently separated from the process wastewater in the clarifier. A concentrated bacterial biomass is maintained in the aeration basin mixed liquor by the airlift pump recycling activated sludge solids that settle in the clarifier back into the aeration basin. Periodic removal, or "wasting", of a portion of the recycled

sludge is achieved by a manually opening a valve that outlets to the sludge lagoon. Process control under varying flow and load conditions is achieved by varying the wasting rate (i.e., varying the time and frequency of operating waste valve), which together with adjustments that can be made in the return sludge rate, enable increasing or decreasing the activated sludge biomass (mixed liquor solids concentration) in the aeration basin.

Key design characteristics of the extended aeration activated sludge process are as follows:

- Concrete lined aeration basin, volume of 500,000 gallons, providing a hydraulic detention time of 30 hours at the design 0.4 MGD flow.
- Three 592 cfm positive displacement air blowers with 25 Hp constant speed motors, any two of which provide sufficient aeration and mixing for the design 0.4 MGD flow in the 500,000 gallon basin.
- An air distribution system consisting of an air header, seven floating aeration chains to which are attached seven float assemblies and a total of 294 fine bubble diffusers.
- Rectangular, lateral-flow clarifier integral to the aeration basin structure with floating inlet baffle, 1000 square foot quiescent settling zone, and 40 foot long surface effluent launder.
- Airlift return sludge pump system.

To date, with average flows and BOD loadings less than 30 percent of the design criteria, the extended air Biolac system has had little difficulty in meeting BOD reduction objectives routinely. The aeration basin and air blower and distribution systems are considered adequate to handle the full 0.4 MGD ADWF design. Typical extended aeration design criteria require a hydraulic detention time of at least 24 hours.

Tertiary Filtration

Alum and polymer chemical feed systems are provided to enhance filter removal of particulates. Each system consists of a 400 gallon tank with propeller mixer and two diaphragm pumps. Either or both chemicals in aqueous solution are applied through injector ports upstream of an in-line static mixer in the secondary effluent pipeline ahead of the filter distribution manifold. Chemical feed rate is set manually.

Filter average hydraulic and solids loadings to date have been sufficiently low such that chemical addition has not typically been necessary to enable downstream disinfection effectiveness.

Continuously backwashed sand filters are provided to reduce effluent total suspended solids (TSS) concentrations to RWQCB permit requirements and turbidity to Title 22 requirements to facilitate reliable chlorine disinfection. While effluent TSS from the upstream clarifier is typically in the 10 to 20 mg/l range, the filters are designed to handle an average TSS of 30 mg/l continuously. The filters are Dynasand upflow, continuous backwash units manufactured by Parkson Corporation.

Secondary effluent enters at the bottom of the filter and flows upward through a 40-inch deep sand bed, with particulate solids strained out. Filtered effluent leaves the unit through an overflow launder. Vertical lift pump tubes convey sand and strained particulate solids in re-circulated filter effluent from the bottom to the top of the filter cell. Given the relative elevations of the upstream clarifier surface and the filter launder, filter feed occurs by gravity, with a minimum design headloss of three feet. Particulate solids are separated from the rising sand in the tubes by the turbulence of the airlift and diluting action of the re-circulated backwash flows. At the outlet of the airlift pump tube, sand falls back onto the top of the media bed by gravity effecting a continuous downflow of filter media. Backwash carrying the filtered solids overflows out a separate launder and is conveyed by gravity to the effluent return pump station. The rate, at which sand is cycled from bottom to top and the amount of backwash carrying solids recycled to the plant return pump station, is governed by the airlift pump rate. The airlift tubes are supplied air from a duplex compressor in an adjacent building. Typical re-circulation rates are from 5 to 10 percent.

In order to comply with Title 22 requirements for direct filtration tertiary treatment processes, filter hydraulic loading must be no greater than 5 gpm/sf of horizontal surface area *at any time*. Four 50 square foot filter cells provide a total of 200 square feet of filter area. With one unit out of service, the remaining three cells can therefore treat 750 gpm or about 1.08 MGD of peak flow. With all four cells in operation, a peak flow of 1.44 MGD can be accommodated. The filters are continues backwash type, so no filter cell goes out of service except for planned or emergency maintenance.

In dry weather, one constant speed pump in the main sewage pump station discharges about 0.98 MGD (680 gpm) for a few minutes at a time. However typically in the dry season, single pump operation during the diurnal peak flow period would be short enough such that the aeration basin and clarifier would typically dampen a 0.98 MGD (680 gpm) influent flow to less than 0.45 MGD (312 gpm) at the filters. Accordingly, in dry weather, two cells in operation are sufficient for Title 22 compliance.

Peak wet weather flows to the WWTP are known to be about 1.1 MGD (760 gpm) with two main pumps running. During wet weather, the pump on cycles may be long enough to translate peak flows through the aeration basin and clarifier impacting the filters. Accordingly, in wet weather, four cells in operation will be required for Title 22 compliance.

Disinfection System

Effluent disinfection prior to discharge to storage is achieved by the addition of chlorine in solution and detention in a chlorine contact basin. Current permit requirements stipulate the discharge to storage shall have 7-day median and daily maximum coliform bacteria counts of 2.2 MPN/100 ml and 23 MPN/100 ml, respectively.

An effluent flow-paced pumps meter hypochlorite into filtered effluent at a mixing box at the inlet end of the chlorine contact basin. A propeller type mechanical mixer provides turbulence to disperse the hypochlorite into the filtered effluent.

Design chlorine feed capability is 8.6 gallons of hypochlorite per hour (8.5 pounds of chlorine per hour of 12.5 % hypochlorite). Actual operating experience under current flows ranges from 6 to 12 mg/l dosing and has been effective in meeting the coliform standard and the CT of 450 mg-minute/L required by Title 22.

Three 4-foot wide, 4.5 foot deep channels in the concrete contact basin provide a length-to-width ratio of 40:1 and a total volume of 20,850 gallons. This capacity enables a theoretical detention time at the design 0.4 MGD average and 1.0 MGD peak flows of 75 minutes and 30 minutes, respectively. At current conditions of 0.11 MGD average and 1.1 MGD peak flow, detention times are 273 minutes and 27 minutes, respectively. A 6-inch throat Parshall flume serves to measure effluent flow to pace the chlorine metering pumps and to maintain liquid depth in the chlorine contact basin.

The Title 22 Reclamation Criteria for unrestricted reuse stipulate "a CT value of no less than 450 mg/l-min at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow". The modal contact time can only be determined accurately by dye tests that establish how long the maximum concentration of dye released at the inlet of the basin takes to reach the outlet end. The modal detention time is always less than the theoretical detention time and is a measure of the extent of short circuiting. A well-design channelized basin with 40:1 length to width ratio like the New Hogan / La Contenta installation is assumed to exhibit a modal contact time about 75 percent of the theoretical contact time.

The peak dry weather flow influent to the WWTP equals the discharge rate from one of the main sewage pumps, or 680 gpm. However, the flow to the chlorine contact basin is damped out by the aeration basin. Therefore, the chlorine contact basin capacity is determined using routing calculations through the aeration basin. Based on a normal diurnal dry weather peaking factor of 1.5 applied to an ADWF of 0.15 MGD and an estimated 6 minute on and 21 minute off pump cycle, the 700 gpm influent flow (680 gpm from the influent pump plus 20 gpm from filter re-circulation) is damped out to a calculated instantaneous flowrate of about 328 gpm at the filters. The resulting 60-minutes running average flow rate at the chlorine contact basin varies between 155 to 174 gpm (assuming 5 percent filter re-circulation rate). Therefore the "theoretical" contact basin detention time is about 120 minutes. Based on this theoretical detention time, the minimum modal contact time of 90 minutes is provided at an ADWF of 0.15 MGD. Aeration basin flow routing modeling calculations are included in Appendix A.

Peak wet weather flows to the WWTP are known to be about 1.1 MGD (760 gpm) with two main pumps running. During wet weather, the pump on cycles may be long enough to translate peak flows through the aeration basin and clarifier impacting the chlorine contact basin. However, based on the flow measurements collected immediately downstream of the chlorine contact basin, the maximum daily flow experienced by the chlorine basin were recorded to be 0.51 MGD during the 1997/98 wet year, which was approximately a 100-year annual precipitation event. At this flow rate a chlorine residual of 22 mg/L was measured. These flow conditions and residual concentrations result in a CT value of 970 mg-min/L, which exceeds the DHS requirements.

Effluent Monitoring

WWTP effluent flow is measured at the Parshall flume and recorded and totalized locally in a control panel in the plant electrical room. The effluent water quality samples are collected manually between the chlorine contact basin and the Parshall flume. Currently, the samples are analyzed daily for total coliform and turbidity, and weekly for BOD_5 and settleable matter. In addition, grab chlorine residual samples are collected daily.

Sludge Handling

Waste activated sludge solids from the activated sludge process are pumped to a concrete-lined sludge lagoon for stabilization and storage prior to gravity dewatering on drying beds. Dried sludge solids are periodically removed from the beds and hauled to a sanitary landfill. Sludge wasting from the activated sludge process is achieved by manual operation of a valve in the discharge piping of the return activated sludge airlift pump.

The 125,000 gallon sludge lagoon is constructed with a floor sloping to a submerged sump, with air diffusers to maintain mixing during sludge withdrawal from a bottom outlet pipe. A manually adjustable overflow outlet enables return of supernatant liquid to the aeration basin via the effluent return pump station.

Based on the design wasting rate of up to 4,400 gallons/day at 0.4 MGD plant flow, the lagoon volume enables a sludge detention time of at least 28 days. Together with the design mean cell residence time in the activated sludge process of from 50 to 70 days, the combined solids detention time is ample for stabilization. In practice under current flow conditions, settled liquid sludge is withdrawn by gravity flow to the drying beds only two or three times a year.

Four 600 square foot sludge drying beds are provided to accommodate a design dry solids loading of 2,240 lbs per week at 0.4 MGD based on a 2 lbs/sf loading. The drying bed surfaces are constructed of Wedgewater filter plates on concrete underdrain slabs. A polymer chemical feed system is available to enhance separation of sludge solids from liquid. Filtrate drains to the effluent return pump station. Two of the beds are situated under a roof for operation during the wet season.

Operation of the drying beds has been satisfactory and ample capacity appears available for at least 0.4 MGD ADWF conditions.

Effluent Return Pumping

Sidestream flows and drains are discharged in separate piping to the effluent return pump station. The pump station operates on level controls to return flow into the WWTP influent force main. Included flows are sludge drying bed filtrate (intermittent), tertiary filter reject water (continuous), and sludge lagoon supernatant (intermittent). Two 20 Hp submersible pumps (Flygt CP3127) are provided, each of which is rated at 430 gpm against a discharge head of 43 feet. With both pumps running, pump discharge totals 715 gpm at 46 feet TDH.

The CCWD is planning to modify this pump station in 2003/4 fiscal year to include return flows from the Upper Storage Reservoir under emergency conditions when it is used in an Emergency Storage role. By this modification, substandard effluent can be returned to the WWTP for re-treatment.

Electrical System

The existing WWTP is supplied with 480 volt, 3 phase power through a 400 amp service. A 150 KW diesel standby power generator is provided as a backup power source with an automatic transfer switch to the existing 400 amp service.

The main service can accommodate addition of a second 400 amp breaker and demand bus for future expansion to double the WWTP capacity.

Effluent Storage and Disposal Facilities

Treated effluent is stored in two reservoirs and is applied as irrigation water during the dry season at the La Contenta Golf Course. The Upper Reservoir, with a capacity of 16 million gallons (49 acre-feet), is located adjacent to the WWTP and receives effluent directly downstream of the effluent Parshall flume. The CCWD is nearing completion of design and permitting to increase the capacity of the Lower Reservoir to 56 million gallons (172 acre-feet) in 2002.

The La Contenta Golf Course consists of 127.4 acres. According to golf course superintendent only 56.4 acres are irrigated. Sections 4.1 and 4.7 describe operation and management of the use area. Section 4.2 addresses operation and management of the reservoirs.

2.6 PLANT RELIABILITY FEATURES

Flexibility of Design

A number of provisions have been made to provide operational flexibility, system redundancy and to prevent bypass of inadequately treated wastewater or failure of the treatment system. Provisions for prevention of bypass and failure include the following:

- The main sewage pump station is furnished with three pumps. Each pump has a design capacity of 750 gpm at the design total hydraulic head of 200 feet. The third pump provides redundancy to the main lift station. The main lift station is also furnished with a standby generator which starts automatically with power failures. Telemetry and alarm system have been installed which advise the District of high and low wet well conditions, pump failure, and standby generator failure and running condition.

- After being pumped to the treatment plant, wastewater flows by gravity through the entire treatment process to the storage reservoirs, and to the irrigation pump station. Gravity flow is a reliable system, which minimizes the threat of spills due to pump failures.

- A standby generator exists to supply emergency power to the aeration blowers, chlorine metering pumps, return lift station, yard lighting and maintenance building. Only one blower can be powered by the generator at a time.

- Three 25 hp blowers are included in the activated sludge process. Any two blowers are capable of meeting the aeration demand associated with the peak design biological oxygen demand (BOD) of 2,065 lb/day. The third blower is provided as a system redundancy. The aeration basin and clarifier are constructed with three feet of freeboard.

- Two chlorine metering pumps have been provided for effluent disinfection.

- After flowing by gravity through the plant, the treated effluent flows by gravity to the Upper and Lower Effluent Storage Reservoirs. A staff gauge has been placed in each reservoir so that the treatment plant operators can monitor reservoir level daily. The overall reservoir capacity is being expanded to provide storage of effluent during 100-year rainfall conditions.

Emergency Storage

Title 22 Reclamation Criteria for unrestricted reuse of treated wastewater require provision of either full process component backup reliability, or the provision of emergency storage of up to 20 days of peak month wastewater flow. The New Hogan / La Contenta WWTP relies on 20 days of storage for emergency conditions.

The Upper Reservoir will be converted it to a dual-purpose basin to function both as treated effluent storage basin and as a Title 22 emergency storage basin after construction of the Lower Reservoir Expansion is completed. The Lower Reservoir will be used as an effluent Storage Reservoir under the normal operating conditions. The Upper Reservoir will receive effluent only when necessary:

- Tertiary effluent only when Lower Reservoir is full.
- Substandard effluent whenever necessary because of treatment process mechanical failure, biological failure, excessively high flows, or any other condition threatening non-compliance with the requirements for Title 22 disinfected tertiary recycled water.

If the Upper Reservoir is ever used for emergency storage, the whole volume of the basin will be re-treated and the basin cleaned prior to re-initiating storage of the treated effluent in the Upper Reservoir. Since any discharge of substandard effluent to Upper Reservoir requires re-treatment of the entire reservoir contents, Upper Reservoir is used only when necessary for tertiary effluent storage.

At maximum storage and disposal capacity of 0.26 MGD ADWF (0.51 MGD peak wet weather flow), at least 10.2 MG of Upper Reservoir capacity will be reserved for emergency storage (i.e, volume sufficient to provide 20 days of storage).

Upper Reservoir embankments were designed to have a permeability of $1.0x10^{-6}$ cm/sec or less. On-site materials used to build the embankments at Upper Reservoir exhibited permeability rates of $3.2x10^{-7}$ to $1.3x10^{-8}$ cm/sec. Permeability tests on the bottom and sides of the reservoir will be completed by the CCWD to determine if in fact the construction is such that permeabilities of at least $1.0x10^{-6}$ cm/sec were achieved. If not, additional lining will be installed.

Instrumentation and Alarms

A local and remote status and alarm systems have been installed at the main sewage pump station and the WWTP. The purpose of these systems is to keep both the plant operator and personnel at the CCWD offices in San Andreas apprised of plant status and alarm conditions. The following local and remote monitoring instrumentation and alarms have been installed:

Main Sewage Pump Station

Local Alarms and Indicators

Wet Pit Very High Level
Wet Pit High Level
Wet Pit Very Low Level
Generator Running
Generator Fail
Pump Station Flow (Recorder)
Pump Select
Wet Pit Exhaust Fans Switches & Timer
Pump No. 1 Running
Pump No. 2 Running
Pump No. 3 Running

Remote Alarms and Indicators

Pump No.1 Failure
Pump No.2 Failure
Pump No.3 Failure
Wet Pit Redundant High Alarm
Wet Pit High Alarm
Wet Pit Low Alarm
Generator Running
Generator Fail

Wastewater Treatment Plant

Local Alarms and Indicators

Generator Running
Generator Failure
Return Pump Station, Very High Sump Level
Return Pump Station, Very Low Sump Level
Return Pump No. 1 Failure
Return Pump No. 2 Failure
Chlorine Metering Pump Failure
Return Pump Station, Redundant High Sump Level
Aqua-Guard Mechanical Filter Screen – Running
Blower No. 1, Aeration Basin – Running
Blower No. 2, Aeration Basin – Running

Remote Alarms and Indicators

Generator Running
Generator Failure
Return Pump Station, Very High Sump Level
Return Pump Station, Very Low Sump Level
Return Pump No. 1 Failure
Return Pump No. 2 Failure
Chlorine Metering Pump Failure
Return Pump Station, Redundant High Sump Level

Blower No. 3, Aeration Basin – Running
Flocculation Rake – Running
Scum Pump – Running
Waste Gate – Timer

One CCWD plant operator is designated for a 7-day period to be on-call person in charge of coordination of the emergency services in response to customer complains or calls and WWTP alarms. The on-call person is equipped with a pager and emergency response procedures. In addition, a back-up system has been developed to autodial both the operation and maintenance supervisor's and superintendent's pagers if the on-call person does not respond to a page within five minutes.

During the installtion of treatment plant improvements, the CCWD will be adding a SCADA system and several additional alarms in 2003/04 fiscal year. One alarm will be added to monitor the secondary process; the second alarm will be added to monitor the tertiary process. These two alarms will be activated if the turbidimeter readings indicate failure of either secondary or tertiary processes. See Section 2.9 for additional information regarding turbidimeters installation and operation. In addition, a continuous chlorine residual monitor and an alarm for disinfection process will be added. The disinfection process alarm will be activated if the product of the chlorine residual and corresponding contact modal time in the chlorine basin does not satisfy the CT requirement of 450 mg-min/L. The contact modal time will be calculated based on the flow measurements at the Parshall flume.

Power failure

In case of a power failure at either main sewage pump station or the WWTP, an alarm will be activated and the standby generator will be automatically activated. Standby generators are provided at both locations. The standby generator at the main sewage pump station is capable of operating two of the three pumps. According to the CCWD staff, the standby generator at the WWTP is designed to operate one of the aeration blowers, chlorine metering pumps, return pump station, yard and maintenance building lighting.

2.7 SUPPLEMENTAL WATER SUPPLY

The amount of recycled water currently available is not be adequate to meet the entire irrigation demand of the La Contenta Golf Course. The golf course purchases additional raw water from the CCWD. Raw water from the New Hogan Reservoir is used to supplement the water supply. At the current wastewater ADWF of 0.11 MGD, 49.5 million gallons per year of supplemental water are projected to be required during a normal rainfall season. During a 100-year rainfall season 31.9 million gallons of the supplemental water are projected to be needed for golf course irrigation at the current ADWF. At ADWF of 0.26 MGD, 12.5 and 4.2 million gallons of supplemental water are projected to be required during average and 100-year rainfall season, respectively.

The cross-connection control and backflow prevention program is described in Section 4.7

2.8 MONITORING AND REPORTING

Operation of the WWTP is monitored consistent with the requirements of the current Waste Discharge Permit. The following monitoring is performed:

Influent Monitoring

An influent flow meter is located at the Main Pump Station. The meter is read daily by the WWTP operators. In addition to the flow measurements, monthly grab samples of influent are analyzed for Biological Oxygen Demand (BOD_5) and Suspend Solids. The samples are collected manually at the headworks during the on cycles of the main pump station.

Effluent Monitoring

WWTP effluent flow is measured at the Parshall flume and recorded and totalized locally in a control panel in the plant electrical room. The effluent water quality grab samples are collected manually just downstream of the chlorine contact basin. The samples are analyzed daily for total coliform and turbidity, and weekly for BOD_5 and settleable matter. In addition, grab chlorine residual samples are collected daily.

Monitoring and operation records are maintained at the WWTP office. Monthly and annual summaries of the records are submitted to the Regional Board.

2.9 CONTINGENCY PLAN

A contingency plan has been developed to prevent inadequately treated effluent from being delivered to the La Contenta golf course. The following conditions would activate the diversion to the emergency storage:

- Failure of the secondary process as indicated by turbidimeter (to be installed downstream of the secondary clarifier).
- Failure of the tertiary process as indicated by turbidimeter (to be installed downstream of the filters).
- Failure of the disinfection process as indicated by the failure of the chlorination equipment or chlorine residual values/ CT.

Under normal operating conditions the effluent after disinfection will be directed toward the Lower Storage Reservoir. Only after the Lower Reservoir is full, will the Upper Reservoir be used for treated effluent storage. If any one of the above describe failures is detected by the WWTP operation monitoring equipment, the diversion of effluent flow from Lower Reservoir to Upper Reservoir will be initiated automatically. All inadequately treated effluent will be diverted to the Upper Reservoir by automatic operation of the valves that will discontinue flow to the Lower Reservoir and initiate flow to the Upper Reservoir. After the problem causing the

diversion has been corrected, the effluent will be again diverted directly to the Lower Reservoir, by-passing the Upper Reservoir. The diversion back to Lower Reservoir will be activated manually. After the Lower Reservoir has been filled, treated effluent will be stored at the Upper Reservoir along with inadequately treated wastewater if any is present. Any commingling of substandard effluent with tertiary effluent will require re-treatment of the entire volume of the Upper Reservoir.

The Upper Reservoir provides at least 20 days of emergency storage under peak month flow conditions during a 100-year rain fall season. At maximum storage and disposal capacity calculated for the New Hogan La Contenta WWTP of 0.26 MGD ADWF (0.51 MGD peak wet weather flow), at least 10.2 MG of the Upper Reservoir capacity will be reserved for the emergency storage.

All substandard effluent stored in the Upper Reservoir will be returned back to the headworks for re-treatment using the Return Pump Station during off peak flow, preferably during the dry weather period of the year. After any emergency use of the Upper Reservoir, it will be completely emptied, dried out, and flushed with chlorinated water prior to returning to use as both an emergency storage basin and an effluent storage basin.

The rate of return flow from the Upper Reservoir will be set so that the combined inflow to the WWTP and return flows do not exceed the filters' capacity of 1.44 MGD with all four cells in operation and chlorine contact basin capacity to deliver the CT of 450 mg/L-min. The modal contact time in the chlorine contact basin during the emergency flow returns might be reduced to less then 90 minutes; however, the CT of 450 mg/L-min will be maintained.

The diversion of substandard effluent to the emergency storage basin requires automatic closure of the valves between the Upper and Lower Reservoirs. If the failure of the treatment process is detected during a power failure, the valves would be operated by the standby generator.

Several modifications to the WWTP facilities have to be constructed in order to enable implementation of this contingency plan. The following modifications are required:

- Installation of a continuous recording turbidimeter downstream of the secondary clarifier.
- Installation of a continuous recording turbidimeter downstream of the tertiary filters.
- Installation of continuous chlorine residual monitor.
- Modification of the Return Pump Station and yard piping to allow the wastewater from the Upper Storage Reservoir to be pumped to the headworks.
- Automation of the two line valves directing flow to the Lower and Upper Reservoirs.
- Electrical modifications required to operate the automatic valves during a power failure.

The CCWD is planning to complete these modifications during the 2003/04 fiscal year.

If failure of the treatment system results in the possibility of inadequately treated wastewater reaching the recycled water user, CCWD would immediately notify the La Contenta Golf Course grounds manager, California Regional Water Quality Board staff and DHS staff.

SECTION 3 TRANSMISSION AND DISTRIBUTION SYSTEM

Treated wastewater is stored in two reservoirs: the Upper Reservoir and the Lower Reservoir. From the Upper Reservoir the treated effluent can be transferred to the Lower Reservoir through an approximately 3,300 feet eight-inch pipeline. The transfer is initiated by activation of a siphon with a shut off valve that is closed if Upper Reservoir contains substandard effluent. From the Lower Reservoir the effluent is delivered to the golf course via 3,700 feet of an eight-inch pipeline. Location of the storage reservoirs and the eight-inch pipeline is shown in Figure 2. The detailed irrigation system layout is included in Appendix B. The description of the irrigation system is presented in Section 4.1. The locations of potable water lines and sewers in the vicinity of the La Contenta golf course are shown in Figures 3 and 4. The water lines and sewers are owned and operated by the CCWD. The golf course irrigation system is owned and operated by the La Contenta Investors.

SECTION 4 USE AREAS

Type of Land Use

The effluent from New Hogan / La Contenta WWTP will be reused as irrigation water on the La Contenta Golf Course during the summer months. The La Contenta Golf Course consists of 127.4 acres. According to golf course superintendent 56.4 acres are irrigated. Irrigated vegetation at the golf course consists primarily of turf grass with some trees and bushes. The overall layout of the golf course is presented in Figure 5.

Responsible Party

The CCWD is responsible for treatment of wastewater, storage of effluent, and for conveying the effluent from the two Storage Reservoirs to the golf course irrigation pump station.

The golf course is owned and operated by the La Contenta Investors. The La Contenta Investors is the responsible party for the use of the tertiary effluent including operation and maintenance of the golf course irrigation system and minimization of effluent runoff from the reclamation area.

The address and contact person for each responsible party are presented below:

John Stewart, Manager
Calaveras County Water District
423 E. St. Sharles Street
San Andreas, CA 95249

Rodney Metzler and Curtis Hammond, General Partners
La Contenta Investors, Inc.
1653 Highway 26
Valley Springs, CA 95252

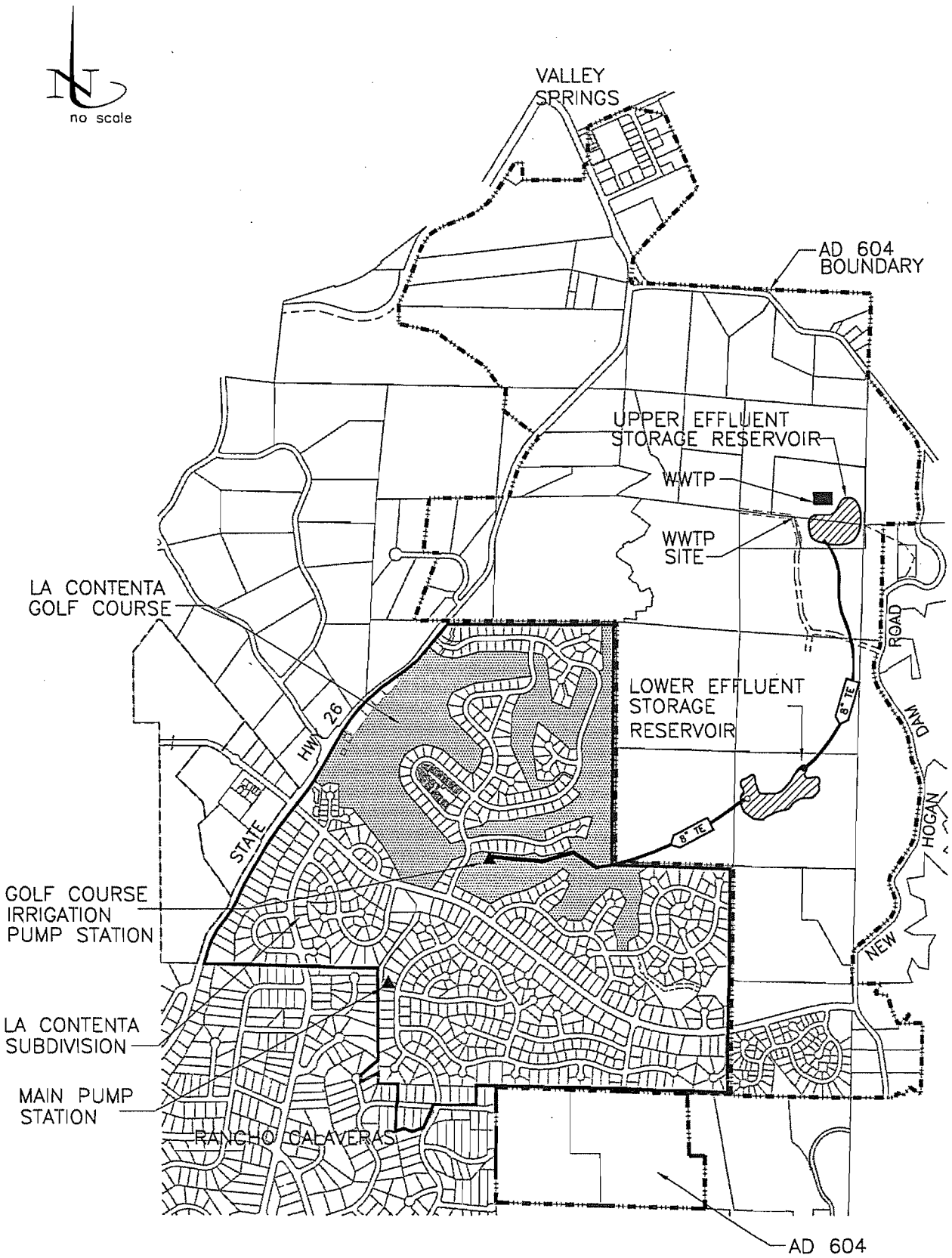
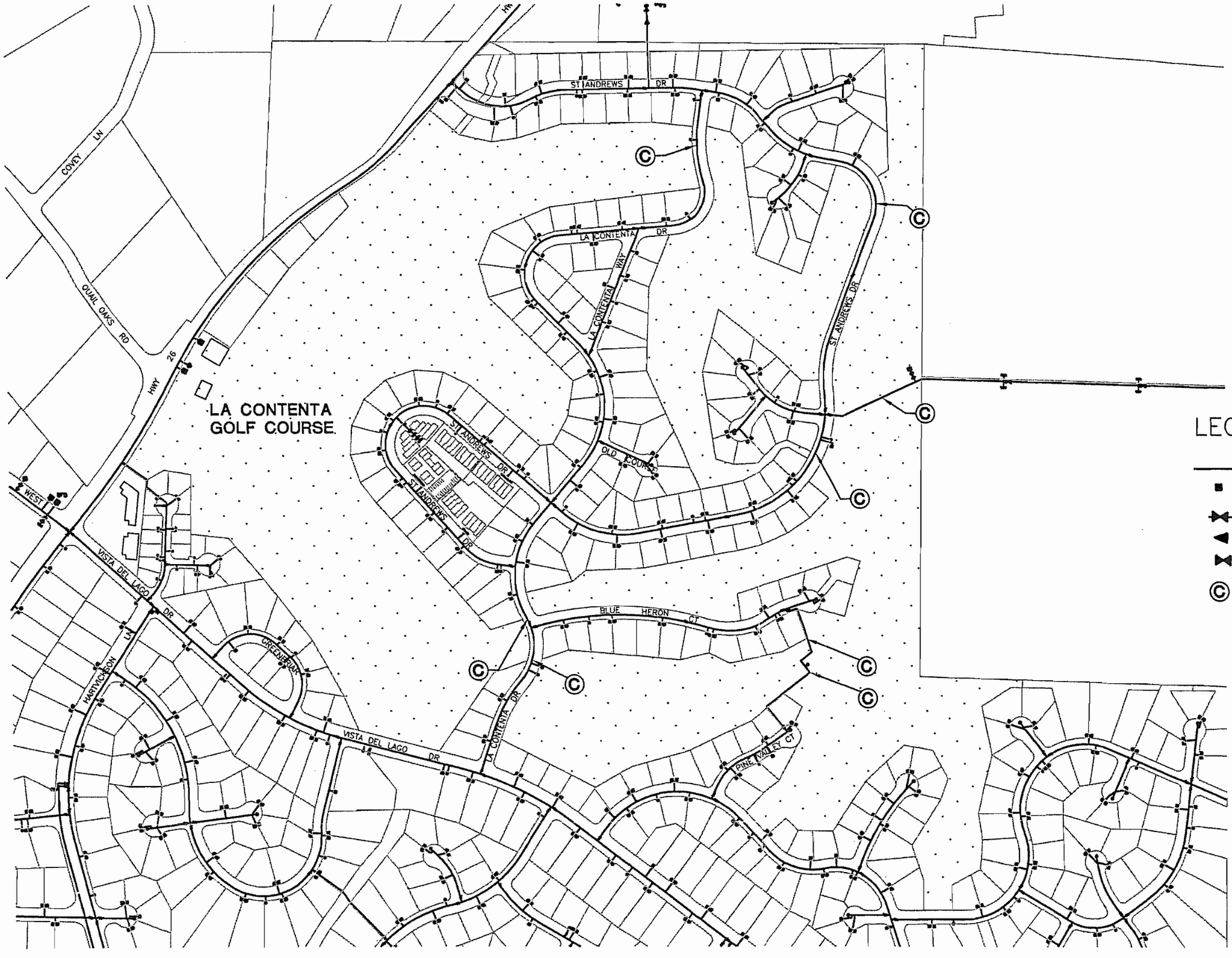


FIGURE 2 - NEW HOGAN / LA CONTENTA WWTP STORAGE AND DISPOSAL FACILITIES



N

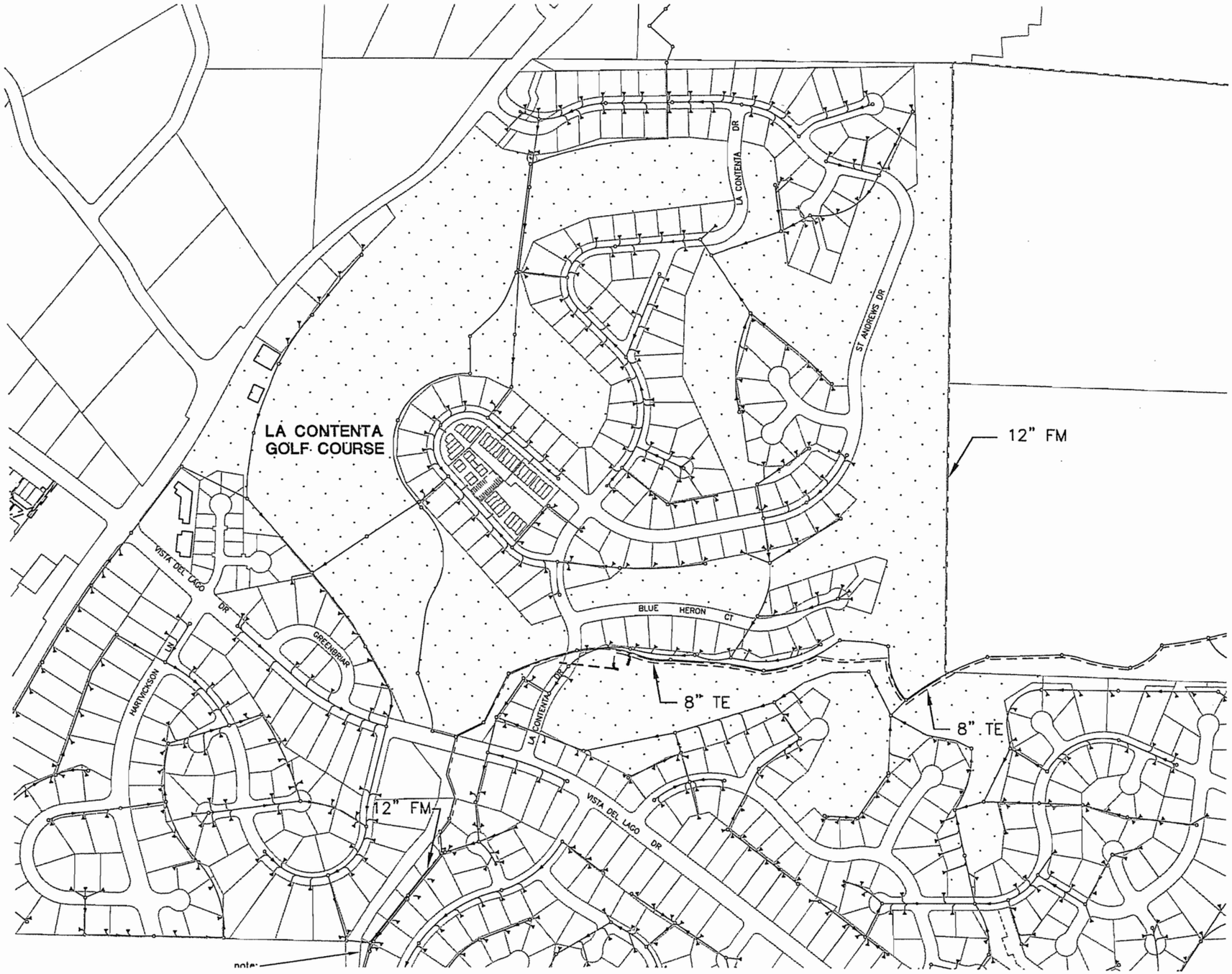
SCALE: 1"=500'

LEGEND

- WATER PIPE
- WATER METER / SERVICE
- FIRE HYDRANT
- AIR VACUM VALVE
- VALVE
- © APPROXIMATE LOCATION OF POTABLE WATER LINE AND RECLAIMED WATER LINE CROSSING

FIGURE 3 - LA CONTENTA WATER SYSTEM
(JENNY LIND PUBLIC WATER SYSTEM)

ECO:LOGIC
Consulting Engineers



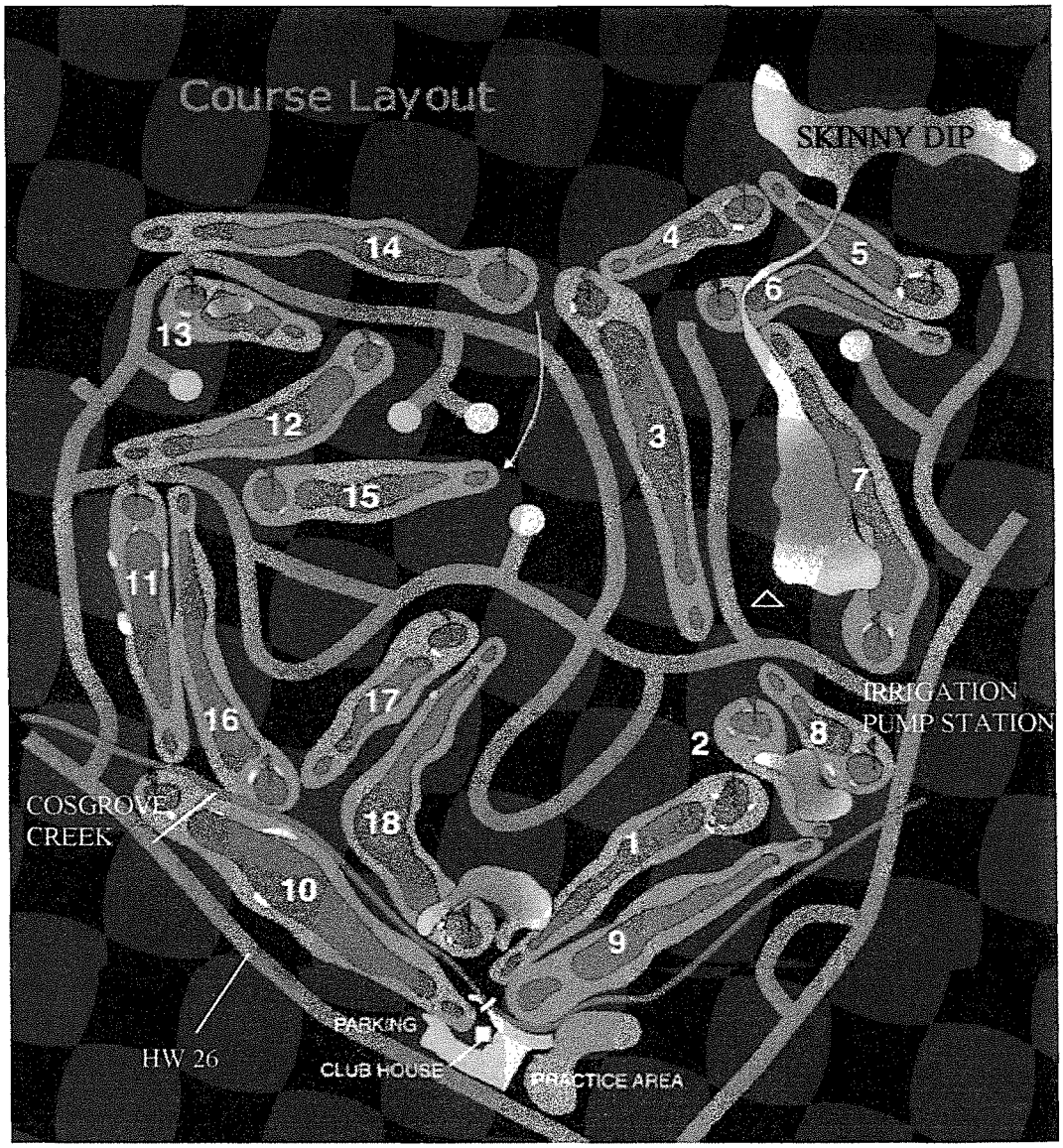
N

SCALE: 1"=500'

LEGEND

- GRAVITY SEWER PIPE
- SEWER FORCE MAIN
- TREATED EFFLUENT
- SEWER MANHOLE
- SEWER SERVICE

FIGURE 4 - LA CONTENTA SEWER SYSTEM



N

NOT TO SCALE

FIGURE 5 - LA CONTENTA GOLF COURSE.

Other Jurisdictional Agencies

Besides DHS, the Regional Board has jurisdiction over the re-use site via the Porter-Cologne Act by the fact that this recycling of tertiary effluent also accomplishes disposal of wastewater.

Use Area Access Control Measures

The use area will not have physical barriers controlling access. The golf course is posted with signage providing notice that the area is irrigated with recycled water. The signs are located around the water hazards. In addition, sprinkler heads and valve boxes are marked with international "Do Not Drink" signs.

Use Area Map

A map of the proposed use area showing surrounding land uses, areas of probable public access, etc, is presented in Figure 6.

Specific Areas of Use

The specific areas of the golf course property that are irrigated are shown in Figure 6. As shown, in some areas the golf course irrigation system extends to the golf course property boundary with adjacent residential lots. In other areas a natural, non-irrigated "rough" exists between the irrigation system and the residential lots. The total land area under irrigation in the tertiary effluent use area is 56.4 acres.

Areas of Public Access

The public can access the golf course property at many locations where roads parallel or cross the golf course. In general, public use of the golf course will be limited to golfers. The non-golfing public will be discouraged by signage from using the golf course as a park because of the danger of being struck by a golf ball and because such persons could be distractions to the golfers.

Surrounding Land Uses

Land uses surrounding the recycled water use area are shown in Figure 6. The major adjacent land uses are residential lots and non-irrigated natural "rough" areas. Public roads also border the golf course in areas.

Important land uses or "features" on the golf course from a recycled water perspective are:

- Several water hazards, and
- Cosgrove Creek.

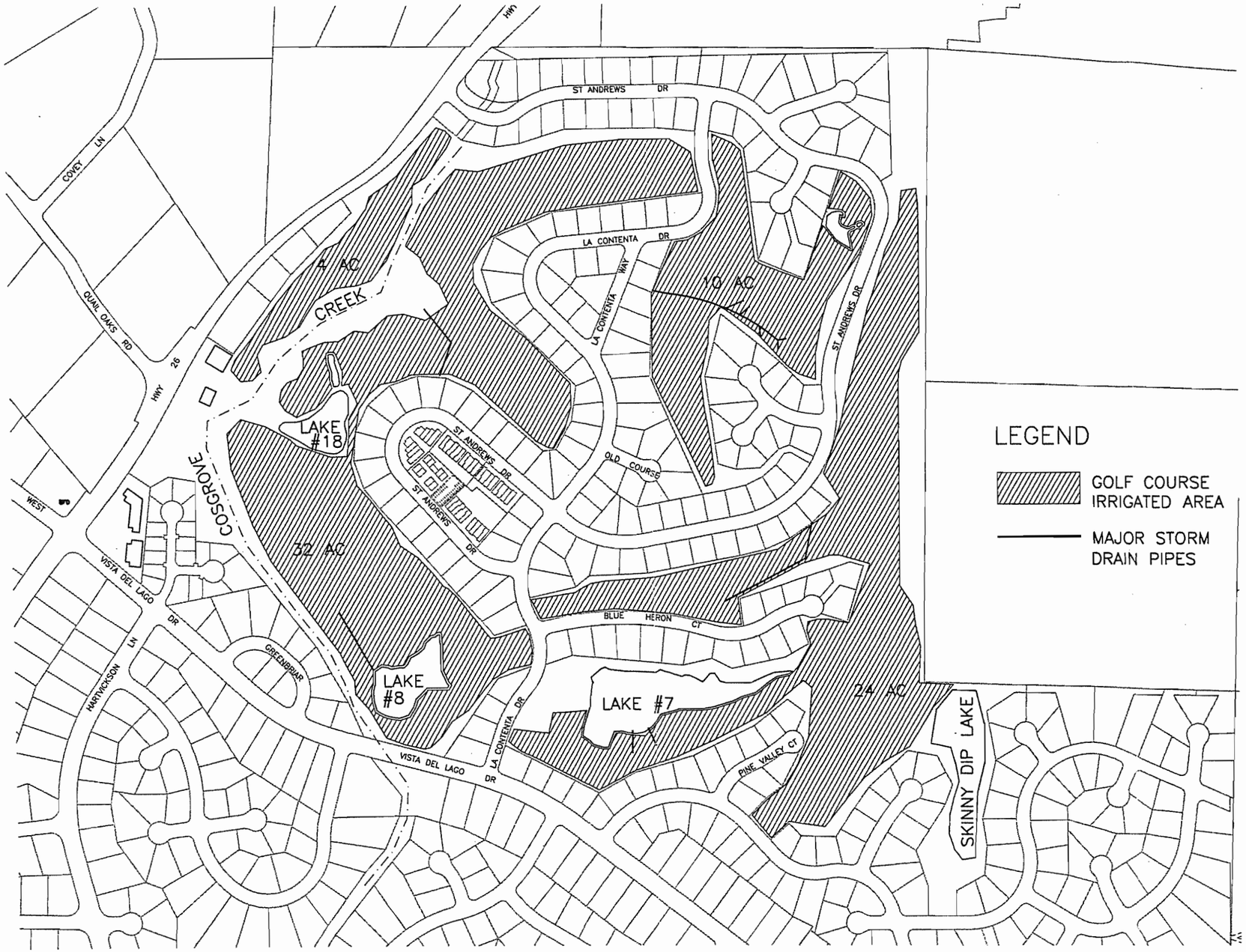


FIGURE 6 - LA CONTENTA GOLF COURSE USE AREA

There are no outdoor drinking fountains on the golf course. However, water coolers and paper cups are located at the tee areas. These coolers are supported and enclosed in the Kooler Aid Water Stations supplied by Western Golf manufacturer.

The irrigation system was designed so that there is essentially no irrigation runoff. Consequently, the water hazards are kept filled with the surface water from the New Hogan Reservoir. The surface water is delivered, first, to the "Skinny Dip" Lake located east of the fifth fairway and Lake #7. From there the raw water is transferred to Lakes #8 and #18. The irrigation area is set back from Cosgrove Creek as shown in Figure 6. The overall intent of the irrigation system design is to keep recycled water out of the water hazards, and out of Cosgrove Creek to the extent feasible.

Wells

There is no established groundwater table in the La Contenta area. Test drillings at La Contenta Golf Course indicated that there was no reliable water available for golf course irrigation. Currently there are no wells, including monitoring wells, present at the WWTP site, at the effluent storage sites or at the La Contenta Golf Course.

Signage

The signs designed to warn the public regarding use of reclaimed water are posted around all the water hazards on the golf course. Wording on the signs is as following:

WARNING
RECLAIMED WATER
NO FISHING
NO SWIMMING
DON'T DRINK THE WATER

International "Do Not Drink" signs are located on top of the sprinkler heads and valve box covers.

Degree of Potential Access

Golf course employees and the general public will have essentially unrestricted access to the golf course. As noted earlier, the general public will be discouraged by signage from accessing the golf course except to play golf, or to spectate an organized golf tournament.

Cross Connection

Surface water is used at the golf course to fill water hazards and to supplement recycled water for irrigation of the golf course. Cross-connection control for raw water is described in Section 4.7.

4.1 IRRIGATION

Irrigated Crop

The crop irrigated is landscape vegetation such as is typical on a golf course. The primary vegetation is various types of fairway and green grasses, including rye grass varieties and bent grass. Some irrigation of shrubs and trees also occurs.

Method of Irrigation

The golf course is irrigated by sprinklers.

Location of Domestic Water Supply Facilities

Domestic water supply facilities constructed in or adjacent to the golf course irrigation system are shown in Figure 3. The relationship between the use area and domestic water supply facilities can be summarized as follows:

- Five potable water pipes enter the use area. The first pipe is used to supply water to the clubhouse. The second water pipe is used to provide water to the maintenance station located of the La Contenta Drive. The third water pipe enters the golf course from St. Andrews Drive and is used to provide water at the restroom located at the 14th hole. The CCWD is planning to negotiate with the La Contenta Investors installation of the backflow prevention devices on these three pipes in the 2003/04 fiscal year. The fourth pipe crosses the 14th fairway and connects to the water pipe located in St. Andrews Drive. The fifth pipe connects Blue Heron Court and Pine Valley Court distribution pipes of the Jenny Lind public water system.

- The surface water from the New Hogan Reservoir is delivered to the golf course water hazards. The water is pumped over the mountain ridge, and then transported in a gravity ditch to the Skinny Dip Lake and Lake #7. These two lakes are connected by a swale and a gravity pipeline. From Lake #7 the raw water is delivered to Lakes #8 and #18 by gravity through the raw water pipelines. The water level in these two lakes is maintained by float operation.

- Potable water pipes cross the reclaimed water irrigation pipes at eight locations. Three of the crossings are in La Contenta Drive, and two additional crossings are located in St. Andrews Drive, where the irrigation lines cross the roadways. A potable water line and an irrigation line cross at the 14th fairway. In addition, a potable water line connecting Blue Heron Court and Pine Valley Court crosses two irrigation lines. The approximate locations of the crossings are shown in Figure 3. The exact locations of the last three crossings are not known. Irrigation lines are sleeved at road crossings.

- There are no crossings between the raw water pipeline from the New Hogan Reservoir and the reclaimed water irrigation line. The raw water gravity pipes connecting the water hazards cross the reclaimed water irrigation pipes at several locations.

- There are no domestic water wells in or near to the use area.

- Potable water fountains previously located at holes 2, 6, 11, 13, 14 and 17 have been removed from the golf course.

Site Containment Measures

The golf course irrigation system was redesigned in 1999 to minimize the use of irrigation water, and to reduce runoff via the following features:

- The sprinkler zones are relatively small.
- Buffers between the irrigated areas and drainage courses have been provided to the extent feasible.
- Each sprinkler irrigation rate can be adjusted individually to correspond with the local soil conditions.
- An on-site weather station measuring daily evapotranspiration is used to adjust daily irrigation rates.

If the system pressure is low (e.g. from a broken pipe) the irrigation pumps stop automatically. This feature prevents runoff that may occur from a broken pipe.

The golf course water hazards have a separate water supply and are maintained using surface water from the New Hogan Reservoir. The golf course irrigation system is design to minimize the runoff of irrigation water to the water hazards as described above.

Drainage of the Golf Course

The major drainage course in the area is Cosgrove Creek. Cosgrove Creek flows through the western portion of the golf course. As discussed below and as shown in Figure 6, the use area is set back from Cosgrove Creek to reduce the chances of any incidental runoff from the golf course irrigation system entering the creek.

Approximately three miles downstream of the golf course property, Cosgrove Creek flows into the Calaveras River. The creek joins the river downstream of the CCWD Jenny Lind potable water treatment plant intake.

Setbacks

The La Contenta golf course uses disinfected tertiary recycled water for irrigation of its landscape. The following setback distances are maintained:

- There is no irrigation with tertiary effluent within 50 feet of any domestic well. There are no domestic wells in the vicinity of the golf course, and none are envisioned in the future.
- There is no impoundment of water of wastewater origins within 100 feet of any domestic water supply well.
- As discussed above, the golf course and its irrigation system are designed to have virtually no runoff. The irrigated area is setback from Cosgrove Creek to the extent feasible to further reduce the potential for runoff from the use area to waters of the State.
- There are no drinking fountains in the use area as discussed in Section 4.0.
- The recycled water use area is posted with signs as discussed in Section 4.0.
- There is no physical connection between the recycled water system and any potable water system.
- The recycled water irrigation system has no hose bibs.

Protection of Water Fountains and Eating Areas

As noted in Section 4.0, there are no water fountains on the golf course. Water coolers in the use area are protected from irrigation sprays and mists. The clubhouse prepares and sells food and provides an air-conditioned, indoor setting for consumption of that food. Some golfers take the food with them in their golf carts and continue to play golf.

Signage

The locations and wording of public warning signs are discussed in Section 4.0.

Irrigation Schedule

The on-site weather station tells the golf course irrigation control system how much, if any, irrigation water is needed on the golf course each night. Based on these calculations, the timer controlling the transfer of the effluent from the Lower Storage Reservoir to the irrigation pump station wet well and the timer controlling the pumps at the New Hogan Reservoir are set daily. Lake #7 water is used for irrigation between the hours of 8:30 p.m. to 5 a.m. The effluent is used for irrigation from approximately 10 p.m. to 4 a.m.

Minimizing Public Contact

No physical means (e.g., fences or guards) are used at the course to exclude public contact with the tertiary effluent once it is leaving the sprinklers. Tertiary effluent spray irrigation will only occur at night when the public should not be present. The golf course also has signs warning the public of the use of recycled water. The signs are located around water hazards.

4.2 IMPOUNDMENTS

Impoundment Use

Two storage reservoirs are used for effluent storage. The Upper Reservoir is located at the WWTP site. The access to this reservoir is restricted by the fence surrounding the WWTP site. The second reservoir is located west of the golf course property. The area surrounding the Lower Reservoir is currently undeveloped. Access to the Lower Reservoir is from the New Hogan Dam Road via a dirt road. The reservoir is currently not fenced; however a fence will enclosed the enlarged reservoir.

Reservoirs are filled in the winter (October through March) and emptied in the summer (April through September) through irrigation of the golf course. The reservoirs and disposal area are designed to accommodate both effluent and direct rainfall during a 100-year rainfall season. Runoff from the adjacent watersheds is captured and re-directed in the swales and ditches around the reservoirs to downslope drainage courses.

The District plans to operate these effluent storage reservoirs as follows: the Lower Storage Reservoir is filled, first, starting in fall. The Upper Storage Reservoir is last-filled and first-emptied each spring so that the Upper Storage Reservoir is empty for as much of the year as is feasible. The reason for this filling and draining protocol that tends to keep the Upper Storage Reservoir empty is that the Upper Storage Reservoir (the smaller reservoir) is designed to function as both a tertiary effluent storage reservoir and the 20-day Emergency Storage (See Section 2.9).

Overflow

The impoundments are sized to hold the tertiary effluent plus rainfall through a 100-year rainy season (approximately 39.6 inches of rainfall) at permitted wastewater flows without encroaching into a two feet freeboard zone below the spillway elevation per RWQCB policy. If a situation arises where the impoundment levees are at risk of being breached, it is most likely to occur in the March to April period. In this highly unusual situation, the CCWD will take several preventive steps including:

- Notifying the community of a critical need to reduce wastewater flows, i.e., curb water usage in the home;

- Lowering potable water system pressure to reduce flow from faucet and shower fixtures; and

- Notifying the RWQCB of the situation.

If these measures do not correct the pending "overflow" situation, then the golf course superintendent will be directed by the CCWD to override the automatic controls on the golf course irrigation system, and over-irrigate the golf course. In this highly unlikely event, the CCWD will monitor the golf course for runoff to Cosgrove Creek, and submit a report to the Regional Board describing the situation, its causes, any known impacts, and any improvements to be made to the overall facilities to prevent the occurrence of the situation in the future.

Drainage

There will be no drainage from Upper and Lower Storage Reservoirs. As discussed above, several steps will be taken to prevent the impoundments from overflowing in an extremely wet season, or some other equally rare and/or unusual event. If some tertiary effluent does reach the Cosgrove Creek drainage, that water will flow downstream to Calaveras River as described in Section 4.1.

4.3 COOLING

No cooling system will be used as part of this project.

4.4 GROUNDWATER RECHARGE

No groundwater recharge will be performed as part of this project.

4.5 DUAL PLUMBED USE AREAS

No dual plumbing will be used as part of this project.

4.6 OTHER INDUSTRIAL USES

No other industrial uses are expected as part of this project.

4.7 USE AREA DESIGN

Protection of the Domestic Water Distribution System

The domestic water supply distribution system will be protected from the tertiary effluent by the CCWD's cross connection prevention plan discussed below. The plan is based on the regulations set forth in:

- Regulations Relating to Cross Connections; and,
- California Waterworks Standards.

Cross-Connection Test

The CCWD and La Contenta Investors will perform a cross-connection test per AWWA guidelines. State and County agencies will be notified and invited to witness the test. The test will consist of the following steps:

1. Turn off the golf course irrigation pump station and leave the potable water system operating.

2. Operate the valves to every irrigation area and confirm the absence of pressurized flow. This demonstrates that no irrigation area has accidentally been connected to the potable water supply unless there is a pressure-sustaining valve (or similar device) at the point of cross connection.

3. Operate the clubhouse irrigation system and all plumbing at the clubhouse. This demonstrates that the clubhouse has been disconnected from the main golf course irrigation system.

4. Repeat the foregoing steps with the golf course irrigation system pressurized and the potable water system turned off. By reversing which system has pressure and by testing all of the water use devices, there is strong evidence that there is no cross connection via a pressure-sustaining valve, check valve, or similar device.

The results of the test will be provided to the State and County health agencies.

Use Area Inspection

Per AWWA guidelines, the CCWD and La Contenta golf course staff will perform an inspection of the proposed use area. The inspection will include the following:

- Confirm that there is only one connection point to this proposed use area irrigation system, and confirm that nothing else is connected to the use area irrigation system. This will be done via the Cross-Connection Test.

- Confirm that all use area above-ground irrigation facilities are located as shown on the plans: sprinklers, valves, drains, controllers etc. This will be done by physically walking the use area with the golf course irrigation plans and the site supervisor. All points of agreement and disagreement between the plans and the field installations will be noted. Any facilities that cannot be readily identified in terms of the plans will be operated to determine function and interconnection to the La Contenta utility network. If necessary, unidentified facilities will be excavated to determine their function and physical characteristics.

- Confirm, again, that the irrigation system does not cause runoff into drainage courses and/or golf course water hazards. If runoff is noted, the site will be modified as necessary to prevent runoff.

- Confirm that the sprinklers do not spray or mist materially beyond the use area, particularly near the drainage courses, water hazards, and residential lots. Change sprinkler operation, sprinkler heads, and/or the irrigation system as needed.

- Confirm that the public access warning signs have been located properly.

The results of the inspection will be provided to the State and County agencies.

Physical Plant

The current physical plant in the use area is described below:

- There are no hose bibs on the irrigation piping system.

- The below ground piping of the golf course irrigation system consists of Type L, Class 200, PVC wrapped in purple (Pantone 512) tape that reads "Caution – Reclaimed Water – Do Not Drink." At road crossings, the PVC pipe is sleeved. Above ground piping is ductile iron water pipe. La Contenta Investors are planning to either paint purple (Pantone 512) the above ground pipe or wrap it in a purple (Pantone 512) tape by the end of the year 2002.

- The valve box covers on the reclaimed water system in the use area were replaced with purple (Pantone 512) covers inscribed "RECLAIMED WATER" on the face of the cover.

- All sprinkler heads have purple (Pantone 512) plates on top of the sprinklers.

- The delivery pipe from the Lower Storage Reservoir site to the golf course irrigation pump station wet well:

- Complies with the California Waterworks Standards.

- Is a PVC gravity pipeline.

- Any time that the delivery pipe is exposed or replaced it will be wrapped in purple (Pantone 512) tape that reads: "Caution – Reclaimed Water – Do not Drink."

- Is designed to meet the separation requirements of AWWA and Appendix J of the 1994 Uniform Plumbing Code.

- The golf course irrigation pump station is enclosed and fenced to prevent public contact with the tertiary effluent. The enclosure has warning sign: "No Trespassing Keep Out."

- The irrigation pump station draws the supplemental water directly from Lake #7. The effluent is delivered via an eight-inch pipeline from the Lower Storage Reservoir directly to the Golf Course Irrigation Pump Station wet well located next to Lake #7 and the golf course maintenance building.

  Currently,the effluent is delivered to the wet well only when the golf course irrigation demand exceeds 800 gpm (this value can be adjusted by golf course superintendent). At the lower demand, only Lake #7 water is used for irrigation. Typically, only Lake #7 water is used for irrigation during the first and last two hours of each irrigation cycle. There is no mechanical devices, e.g. check valve, that will prevent effluent in the wet well from entering Lake #7. However, the effluent is only introduced into the wet well during the irrigation cycle when the irrigation pumps are in operation. There are four irrigation pumps at the golf course irrigation pump station. In unlikely case of multiple pumps failure while effluent is been delivered to the wet well, the effluent will be commingling with Lake #7 water.

- The surface water supply pipeline that connects to the gravity ditch that enters the golf course property to fill the golf course water hazards (Skinny Dip Lake and Lake #7):

  - Complies with the California Waterworks Standards.

  - Has a check valve located at the New Hogan Reservoir pump station.

- If water hazards are accidentally overfilled with surface water, the the water hazards overflow to Cosgrove Creek without causing water backup in the surface water delivery pipeline from New Hogan Reservoir.

- Each lateral off the potable water supply pipeline that enters the golf course property to supply water to club house, maintenance station, and restroom:

  - Complies with the California Waterworks Standards.

– Will have a reduced pressure backflow device where it enters the golf course property. The CCWD and La Contenta Investors are negotiating to install the backflow devices in the 2003/04 fiscal year.

4.8 USE AREA INSPECTION AND MONITORING

The use area is inspected daily by the golf course maintenance staff. The primary objective of this inspection is to assess the health of the golf course vegetation. Vegetation health is most directly linked to the proper function of the irrigation system. Thus, the vegetation and irrigation system is inspected and monitored essentially daily to detect and correct any potential overspraying, ponding of water, or excessive runoff. As discussed previously, the irrigation system and use area are designed to prevent problems of ponding, runoff, and overspray.

If runoff, overspray, or misting problems are detected, the problem will be corrected by changing the sprinkler head, irrigation system, and/or vegetation, as necessary. On-going modifications to the system are expected, and will be driven primarily by the on-going inspections and monitoring by the golf course maintenance staff.

4.9 EMPLOYEE TRAINING

The golf course employees operating the use area obtain training on the disposal of the effluent. The training program addresses issues relevant to working with effluent, including but not limited to the following:

- What is the nature of recycled water.
- What type of recycled water is being produced by New Hogan /La Contenta WWTP and is being used on the La Contenta golf course.
- How the irrigation control system works:
  - Irrigation and timing of irrigation cycles.
  - What the employee is to do if the system is not working as planned.
- Why effluent is not allowed to runoff into the drainage courses and water hazards.

The training program includes review of this Engineering Report and Waste Discharge Requirements for the New Hogan / La Contenta WWTP.

APPENDIX A

AERATION BASIN FLOW ROUTING MODELING CALCULATIONS

Flow Routing Through Aeration Basin/Clarifier

I. Develop elevation – storage table

Storage (ft^3) = (8,865.3)(elevation, ft) – 56,647.8
For elevation > 16 ft.

II. Develop inflow hydrograph

Average Dry Weather Flow = 0.15 MGD

Peaking Factor = 1.5

Peak Dry Weather Flow = 0.225 MGD = 156.25 gpm

Pump Capacity = 680 gpm (single pump in operation)

Wet Well Volume (between on and off cycles) = 3,222 gallons

Pump On Cycle = 3,222 gallons / (680 –156.25) gpm = 6 minutes

Pump Off Cycle = 3,222 gallons / 156.25 gpm = 21 minutes

Filter Re-circulation Rate = 5 to 10 % inflow, assume 20 gpm

Time (min)	Flow (ft^3/sec)	Flow (gpm)
0 – 9	0.04456	20
10 – 15	1.596	700
16 – 36	0.04456	20

III. Develop Outflow expression

V-notch weir equation: $Q = 90\left(2.5H^{2.5}\right)$

Where Q is flow in ft^3/sec
H is elevation in ft, and
90 is the number of V-notch weirs at the La Contenta clarifier

IV. Make up a table of Q vs. $\left(\frac{2S}{\Delta t}+Q\right)_{n+1}$

$$\frac{2S}{\Delta t}+Q=\frac{2S}{60\,\text{sec}}+Q$$

$$\frac{2S}{\Delta t}+Q=0.03333S+Q$$

Where Q is flow in ft^3/sec, and
S is storage in ft^3.

See attached spreadsheet for calculations.

LA CONTENTA WWTP AERATION BASIN
FLOW MODELING BASED ONADWF OF 0.15 MGD (6 MINUTES ON AND 21 MINUTES OFF PUMP CYCLE)
PUMP CAPACIRY 680 GALLONS PER MINUTE

Time (min)	nflow (gpm	Inflow (cfs)	2S/dt-Q	2S/dt+Q	Water Surface Elevation (ft)	Storage (cu. Ft.)	Flow (cfs)	(2S/dT+Q	Difference
0.0	20.0	0.04456	2633.8	2633.901	16.027	79024.14	0.026536	2633.901	0.00
1.0	20.0	0.04456	2633.8	2633.901	16.027	79024.14	0.026536	2633.901	0.00
2.0	20.0	0.04456	2633.9	2633.937	16.027	79025.2	0.026846	2633.937	0.00
3.0	20.0	0.04456	2633.9	2633.972	16.027	79026.25	0.027156	2633.972	0.00
4.0	20.0	0.04456	2634.0	2634.007	16.027	79027.29	0.027463	2634.007	0.00
5.0	20.0	0.04456	2634.0	2634.041	16.027	79028.3	0.027766	2634.041	0.00
6.0	20.0	0.04456	2634.0	2634.075	16.027	79029.29	0.028065	2634.074	0.00
7.0	20.0	0.04456	2634.1	2634.108	16.028	79030.27	0.028361	2634.107	0.00
8.0	20.0	0.04456	2634.1	2634.140	16.028	79031.23	0.028654	2634.14	0.00
9.0	20.0	0.04456	2634.1	2634.172	16.028	79032.2	0.028952	2634.172	0.00
10.0	700.0	1.5596	2635.6	2635.719	16.033	79078.11	0.045212	2635.719	0.00
11.0	700.0	1.5596	2638.6	2638.747	16.044	79167.63	0.090245	2638.747	0.00
12.0	700.0	1.5596	2641.4	2641.686	16.054	79253.94	0.152306	2641.686	0.00
13.0	700.0	1.5596	2644.0	2644.501	16.064	79336.04	0.230218	2644.501	0.00
14.0	700.0	1.5596	2646.5	2647.159	16.073	79413.08	0.321488	2647.159	0.00
15.0	700.0	1.5596	2648.8	2649.636	16.081	79484.34	0.422668	2649.636	0.00
16.0	20.0	0.04456	2649.5	2650.394	16.084	79506.08	0.456887	2650.394	0.00
17.0	20.0	0.04456	2648.7	2649.570	16.081	79482.45	0.419771	2649.57	0.00
18.0	20.0	0.04456	2648.0	2648.819	16.078	79460.9	0.387554	2648.819	0.00
19.0	20.0	0.04456	2647.4	2648.133	16.076	79441.16	0.35939	2648.133	0.00
20.0	20.0	0.04456	2646.8	2647.504	16.074	79423.01	0.334609	2647.504	0.00
21.0	20.0	0.04456	2646.3	2646.924	16.072	79406.27	0.312678	2646.924	0.00
22.0	20.0	0.04456	2645.8	2646.387	16.070	79390.76	0.293165	2646.387	0.00
23.0	20.0	0.04456	2645.3	2645.890	16.068	79376.37	0.275719	2645.89	0.00
24.0	20.0	0.04456	2644.9	2645.428	16.067	79362.97	0.260051	2645.428	0.00
25.0	20.0	0.04456	2644.5	2644.997	16.065	79350.46	0.245922	2644.997	0.00
26.0	20.0	0.04456	2644.1	2644.594	16.064	79338.76	0.233131	2644.594	0.00
27.0	20.0	0.04456	2643.8	2644.217	16.063	79327.8	0.221512	2644.217	0.00
28.0	20.0	0.04456	2643.4	2643.863	16.061	79317.5	0.210921	2643.863	0.00
29.0	20.0	0.04456	2643.1	2643.530	16.060	79307.8	0.201239	2643.53	0.00
30.0	20.0	0.04456	2642.8	2643.217	16.059	79298.67	0.192362	2643.217	0.00
31.0	20.0	0.04456	2642.6	2642.921	16.058	79290.04	0.184201	2642.921	0.00
32.0	20.0	0.04456	2642.3	2642.642	16.057	79281.89	0.17668	2642.642	0.00
33.0	20.0	0.04456	2642.0	2642.378	16.056	79274.17	0.169732	2642.378	0.00
34.0	20.0	0.04456	2641.8	2642.128	16.056	79266.85	0.163299	2642.128	0.00
35.0	20.0	0.04456	2641.6	2641.890	16.055	79259.91	0.15733	2641.89	0.00
36.0	20.0	0.04456	2641.4	2641.665	16.054	79253.31	0.151782	2641.665	0.00
37.0	700.0	1.5596	2642.6	2642.965	16.058	79291.32	0.185395	2642.965	0.00
38.0	700.0	1.5596	2645.2	2645.714	16.068	79371.25	0.289671	2645.714	0.00
39.0	700.0	1.5596	2647.6	2648.293	16.077	79445.77	0.365851	2648.293	0.00
40.0	700.0	1.5596	2649.7	2650.681	16.085	79514.27	0.470203	2650.681	0.00
41.0	700.0	1.5596	2651.7	2652.860	16.092	79576.39	0.578707	2652.86	0.00
42.0	700.0	1.5596	2653.4	2654.821	16.099	79631.98	0.687494	2654.821	0.00
43.0	20.0	0.04456	2653.6	2655.051	16.099	79638.46	0.700897	2655.051	0.00
44.0	20.0	0.04456	2652.5	2653.738	16.095	79601.32	0.626099	2653.738	0.00
45.0	20.0	0.04456	2651.4	2652.575	16.091	79568.29	0.563793	2652.575	0.00
46.0	20.0	0.04456	2650.5	2651.536	16.088	79538.71	0.511279	2651.536	0.00
47.0	20.0	0.04456	2649.7	2650.603	16.084	79512.04	0.46656	2650.603	0.00
48.0	20.0	0.04456	2648.9	2649.759	16.082	79487.87	0.428128	2649.759	0.00
49.0	20.0	0.04456	2648.2	2648.992	16.079	79465.86	0.394829	2648.992	0.00
50.0	20.0	0.04456	2647.6	2648.291	16.077	79445.71	0.365766	2648.291	0.00
51.0	20.0	0.04456	2647.0	2647.649	16.074	79427.2	0.340233	2647.649	0.00
52.0	20.0	0.04456	2646.4	2647.058	16.072	79410.14	0.317666	2647.058	0.00
53.0	20.0	0.04456	2645.9	2646.511	16.071	79394.35	0.297612	2646.511	0.00
54.0	20.0	0.04456	2645.4	2646.005	16.069	79379.7	0.279702	2646.005	0.00
55.0	20.0	0.04456	2645.0	2645.535	16.067	79366.08	0.263634	2645.535	0.00
56.0	20.0	0.04456	2644.6	2645.097	16.066	79353.36	0.249158	2645.097	0.00
57.0	20.0	0.04456	2644.2	2644.688	16.064	79341.48	0.236065	2644.688	0.00
58.0	20.0	0.04456	2643.9	2644.305	16.063	79330.34	0.22418	2644.305	0.00
59.0	20.0	0.04456	2643.5	2643.945	16.062	79319.89	0.213356	2643.945	0.00
60.0	20.0	0.04456	2643.2	2643.608	16.061	79310.06	0.203468	2643.608	0.00
61.0	20.0	0.04456	2642.9	2643.290	16.060	79300.8	0.194407	2643.29	0.00
62.0	20.0	0.04456	2642.6	2642.990	16.058	79292.05	0.186083	2642.99	0.00
63.0	20.0	0.04456	2642.4	2642.707	16.058	79283.79	0.178416	2642.707	0.00
64.0	700.0	1.5596	2643.5	2643.955	16.062	79320.16	0.213629	2643.955	0.00
65.0	700.0	1.5596	2646.0	2646.646	16.071	79398.26	0.302503	2646.646	0.00
66.0	700.0	1.5596	2648.4	2649.161	16.080	79470.71	0.402025	2649.161	0.00
67.0	700.0	1.5596	2650.5	2651.476	16.087	79536.98	0.508305	2651.476	0.00
68.0	700.0	1.5596	2652.3	2653.578	16.094	79596.79	0.617332	2653.578	0.00
69.0	700.0	1.5596	2654.0	2655.463	16.101	79650.09	0.72538	2655.463	0.00
70.0	20.0	0.04456	2654.1	2655.616	16.101	79654.42	0.73461	2655.616	0.00
71.0	20.0	0.04456	2652.9	2654.236	16.097	79615.43	0.65393	2654.236	0.00
72.0	20.0	0.04456	2651.8	2653.017	16.093	79580.87	0.587067	2653.017	0.00
73.0	20.0	0.04456	2650.9	2651.932	16.089	79550	0.530963	2651.932	0.00
74.0	20.0	0.04456	2650.0	2650.960	16.086	79522.24	0.483373	2650.96	0.00
75.0	20.0	0.04456	2649.2	2650.082	16.083	79497.13	0.442616	2650.082	0.00
76.0	20.0	0.04456	2648.5	2649.286	16.080	79474.3	0.407412	2649.286	0.00
77.0	20.0	0.04456	2647.8	2648.560	16.078	79453.45	0.376772	2648.56	0.00
78.0	20.0	0.04456	2647.2	2647.896	16.075	79434.32	0.349921	2647.896	0.00
79.0	20.0	0.04456	2646.6	2647.285	16.073	79416.71	0.326244	2647.285	0.00
80.0	20.0	0.04456	2646.1	2646.722	16.071	79400.43	0.305247	2646.722	0.00
81.0	20.0	0.04456	2645.6	2646.200	16.070	79385.35	0.286531	2646.2	0.00
82.0	20.0	0.04456	2645.2	2645.716	16.068	79371.34	0.269769	2645.716	0.00
83.0	20.0	0.04456	2644.8	2645.266	16.066	79358.27	0.254692	2645.266	0.00
84.0	20.0	0.04456	2644.4	2644.846	16.065	79346.07	0.241076	2644.846	0.00
85.0	20.0	0.04456	2644.0	2644.453	16.064	79334.65	0.228733	2644.453	0.00
86.0	20.0	0.04456	2643.6	2644.084	16.062	79323.94	0.217507	2644.084	0.00
87.0	20.0	0.04456	2643.3	2643.738	16.061	79313.87	0.207264	2643.738	0.00
88.0	20.0	0.04456	2643.0	2643.413	16.060	79304.38	0.197888	2643.413	0.00
89.0	20.0	0.04456	2642.7	2643.106	16.059	79295.44	0.189284	2643.106	0.00
90.0	20.0	0.04456	2642.5	2642.817	16.058	79287	0.181367	2642.817	0.00

	Summary					
Time (min)	Inflow (gpm)	Outflow (gpm)	Filters -5%	Outflow' (gpm)	60-minutes Average	90-minutes Average
0	20	20	-1	19		
1	20	12	-1	11		
2	20	12	-1	11		
3	20	12	-1	12		
4	20	12	-1	12		
5	20	12	-1	12		
6	20	13	-1	12		
7	20	13	-1	12		
8	20	13	-1	12		
9	20	13	-1	12		
10	700	20	-1	19		
11	700	41	-2	38		
12	700	68	-3	65		
13	700	103	-5	98		
14	700	144	-7	137		
15	700	190	-9	180		
16	20	205	-10	195		
17	20	188	-9	179		
18	20	174	-9	165		
19	20	161	-8	153		
20	20	150	-8	143		
21	20	140	-7	133		
22	20	132	-7	125		
23	20	124	-6	118		
24	20	117	-6	111		
25	20	110	-6	105		
26	20	105	-5	99		
27	20	99	-5	94		
28	20	95	-5	90		
29	20	90	-5	86		
30	20	86	-4	82		
31	20	83	-4	79		
32	20	79	-4	75		
33	20	76	-4	72		
34	20	73	-4	70		
35	20	71	-4	67		
36	20	68	-3	65		
37	700	83	-4	79		
38	700	121	-6	115		
39	700	164	-8	156		
40	700	211	-11	200		
41	700	260	-13	247		
42	700	309	-15	293		
43	20	315	-16	299		
44	20	281	-14	267		
45	20	253	-13	240		
46	20	229	-11	218		
47	20	209	-10	199		
48	20	192	-10	183		
49	20	177	-9	168		
50	20	164	-8	156		
51	20	153	-8	145		
52	20	143	-7	135		
53	20	134	-7	127		
54	20	126	-6	119		
55	20	118	-6	112		
56	20	112	-6	106		
57	20	106	-5	101		
58	20	101	-5	96		
59	20	96	-5	91		
60	20	91	-5	87		
61	20	87	-4	83		
62	20	84	-4	79		
63	20	80	-4	76		
64	700	96	-5	91		
65	700	136	-7	129		
66	700	180	-9	171		
67	700	228	-11	217		
68	700	277	-14	263		
69	700	326	-16	309		
70	20	330	-16	313		
71	20	293	-15	279		
72	20	263	-13	250		
73	20	238	-12	226		
74	20	217	-11	206		
75	20	199	-10	189		
76	20	183	-9	174		
77	20	169	-8	161		
78	20	157	-8	149		
79	20	146	-7	139		
80	20	137	-7	130		
81	20	129	-6	122		
82	20	121	-6	115		
83	20	114	-6	109		
84	20	108	-5	103		
85	20	103	-5	98		
86	20	98	-5	93		
87	20	93	-5	88		
88	20	89	-4	84		
89	20	85	-4	81		
90	20	81	-4	77		

Time (min)	nflow (gpm	Inflow (cfs)	2S/dt-Q	2S/dt+Q
91.0	700.0	1.5596	2643.6	2644.058
92.0	700.0	1.5596	2646.1	2646.744
93.0	700.0	1.5596	2648.4	2649.251
94.0	700.0	1.5596	2650.5	2651.559
95.0	700.0	1.5596	2652.4	2653.653
96.0	700.0	1.5596	2654.1	2655.529
97.0	20.0	0.04456	2654.2	2655.675
98.0	20.0	0.04456	2653.0	2654.288
99.0	20.0	0.04456	2651.9	2653.063
100.0	20.0	0.04456	2650.9	2651.973
101.0	20.0	0.04456	2650.0	2650.996
102.0	20.0	0.04456	2649.2	2650.115
103.0	20.0	0.04456	2648.5	2649.316
104.0	20.0	0.04456	2647.8	2648.588
105.0	20.0	0.04456	2647.2	2647.921
106.0	20.0	0.04456	2646.7	2647.308
107.0	20.0	0.04456	2646.1	2646.743
108.0	20.0	0.04456	2645.6	2646.220
109.0	20.0	0.04456	2645.2	2645.735
110.0	20.0	0.04456	2644.8	2645.283
111.0	20.0	0.04456	2644.4	2644.862
112.0	20.0	0.04456	2644.0	2644.468
113.0	20.0	0.04456	2643.7	2644.098
114.0	20.0	0.04456	2643.3	2643.752
115.0	20.0	0.04456	2643.0	2643.426
116.0	20.0	0.04456	2642.7	2643.118
117.0	20.0	0.04456	2642.5	2642.828
118.0	700.0	1.5596	2643.6	2644.069
119.0	700.0	1.5596	2646.1	2646.754
120.0	700.0	1.5596	2648.4	2649.260
121.0	700.0	1.5596	2650.5	2651.567
122.0	700.0	1.5596	2652.4	2653.661
123.0	700.0	1.5596	2654.1	2655.536
124.0	20.0	0.04456	2654.2	2655.681
125.0	20.0	0.04456	2653.0	2654.293
126.0	20.0	0.04456	2651.9	2653.068
127.0	20.0	0.04456	2650.9	2651.977
128.0	20.0	0.04456	2650.0	2651.000
129.0	20.0	0.04456	2649.2	2650.119
130.0	20.0	0.04456	2648.5	2649.319
131.0	20.0	0.04456	2647.8	2648.591
132.0	20.0	0.04456	2647.2	2647.924
133.0	20.0	0.04456	2646.7	2647.311
134.0	20.0	0.04456	2646.1	2646.745
135.0	20.0	0.04456	2645.6	2646.222
136.0	20.0	0.04456	2645.2	2645.737
137.0	20.0	0.04456	2644.8	2645.285
138.0	20.0	0.04456	2644.4	2644.863
139.0	20.0	0.04456	2644.0	2644.469
140.0	20.0	0.04456	2643.7	2644.100
141.0	20.0	0.04456	2643.3	2643.753
142.0	20.0	0.04456	2643.0	2643.427
143.0	20.0	0.04456	2642.7	2643.119
144.0	20.0	0.04456	2642.5	2642.829
145.0	700.0	1.5596	2643.6	2644.070
146.0	700.0	1.5596	2646.1	2646.755
147.0	700.0	1.5596	2648.4	2649.261
148.0	700.0	1.5596	2650.5	2651.568
149.0	700.0	1.5596	2652.4	2653.661
150.0	700.0	1.5596	2654.1	2655.537
151.0	20.0	0.04456	2654.2	2655.681
152.0	20.0	0.04456	2653.0	2654.293
153.0	20.0	0.04456	2651.9	2653.068
154.0	20.0	0.04456	2650.9	2651.978
155.0	20.0	0.04456	2650.0	2651.000
156.0	20.0	0.04456	2649.2	2650.119
157.0	20.0	0.04456	2648.5	2649.319
158.0	20.0	0.04456	2647.8	2648.591
159.0	20.0	0.04456	2647.2	2647.924
160.0	20.0	0.04456	2646.7	2647.311
161.0	20.0	0.04456	2646.1	2646.746
162.0	20.0	0.04456	2645.6	2646.222
163.0	20.0	0.04456	2645.2	2645.737
164.0	20.0	0.04456	2644.8	2645.285
165.0	20.0	0.04456	2644.4	2644.864

Water Surface Elevation (ft)	Storage (cu. Ft.)	Flow (cfs)	(2S/dT+Q	Difference
16.062	79323.18	0.216728	2644.058	0.00
16.071	79401.08	0.305066	2646.744	0.00
16.080	79473.31	0.405913	2649.251	0.00
16.088	79539.34	0.512369	2651.559	0.00
16.095	79598.91	0.621423	2653.653	0.00
16.101	79651.96	0.729369	2655.529	0.00
16.101	79656.06	0.738144	2655.675	0.00
16.097	79616.88	0.656839	2654.288	0.00
16.093	79582.17	0.589494	2653.063	0.00
16.089	79551.16	0.533011	2651.973	0.00
16.086	79523.29	0.485119	2650.996	0.00
16.083	79498.08	0.444117	2650.115	0.00
16.080	79475.17	0.408714	2649.316	0.00
16.078	79454.24	0.377909	2648.588	0.00
16.075	79435.05	0.350921	2647.921	0.00
16.073	79417.38	0.327128	2647.308	0.00
16.071	79401.05	0.306033	2646.743	0.00
16.070	79385.93	0.287233	2646.22	0.00
16.068	79371.87	0.270399	2645.735	0.00
16.066	79358.77	0.25526	2645.283	0.00
16.065	79346.54	0.24159	2644.862	0.00
16.064	79335.09	0.2292	2644.468	0.00
16.062	79324.35	0.217932	2644.098	0.00
16.061	79314.25	0.207652	2643.752	0.00
16.060	79304.75	0.198244	2643.426	0.00
16.059	79295.79	0.189611	2643.118	0.00
16.058	79287.32	0.181668	2642.828	0.00
16.062	79323.49	0.217044	2644.069	0.00
16.071	79401.37	0.306429	2646.754	0.00
16.080	79473.57	0.406309	2649.26	0.00
16.088	79539.58	0.512782	2651.567	0.00
16.095	79599.12	0.621839	2653.661	0.00
16.101	79652.16	0.729775	2655.536	0.00
16.102	79656.23	0.738504	2655.681	0.00
16.097	79617.03	0.657134	2654.293	0.00
16.093	79582.3	0.58974	2653.068	0.00
16.089	79551.28	0.533219	2651.977	0.00
16.086	79523.39	0.485298	2651	0.00
16.083	79498.18	0.44427	2650.119	0.00
16.080	79475.26	0.408846	2649.319	0.00
16.078	79454.32	0.378025	2648.591	0.00
16.075	79435.12	0.351022	2647.924	0.00
16.073	79417.45	0.327217	2647.311	0.00
16.071	79401.12	0.306112	2646.745	0.00
16.070	79385.99	0.287304	2646.222	0.00
16.068	79371.93	0.270463	2645.737	0.00
16.066	79358.83	0.255317	2645.285	0.00
16.065	79346.59	0.241642	2644.863	0.00
16.064	79335.13	0.229247	2644.469	0.00
16.062	79324.39	0.217976	2644.1	0.00
16.061	79314.29	0.207691	2643.753	0.00
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16.066	79358.83	0.255323	2645.285	0.00
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Summary

Time (min)	Inflow (gpm)	Outflow (gpm)	Filters -5%	Outflow' (gpm)	60-minutes Average	90-minutes Average
91	700	97	-5	92		
92	700	137	-7	130		
93	700	182	-9	173		
94	700	230	-11	218		
95	700	279	-14	265		
96	700	327	-16	311		
97	20	331	-17	315		
98	20	295	-15	280		
99	20	265	-13	251		
100	20	239	-12	227		
101	20	218	-11	207		
102	20	199	-10	189		
103	20	183	-9	174		
104	20	170	-8	161		
105	20	157	-8	150		
106	20	147	-7	139		
107	20	137	-7	130		
108	20	129	-6	122		
109	20	121	-6	115		
110	20	115	-6	109		
111	20	108	-5	103		
112	20	103	-5	98		
113	20	98	-5	93		
114	20	93	-5	89		
115	20	89	-4	85		
116	20	85	-4	81		
117	20	82	-4	77		
118	700	97	-5	93		
119	700	138	-7	131		
120	700	182	-9	173		
121	700	230	-12	219	159	
122	700	279	-14	265	162	
123	700	328	-16	311	166	
124	20	331	-17	315	169	
125	20	295	-15	280	172	
126	20	265	-13	251	173	
127	20	239	-12	227	173	
128	20	218	-11	207	173	
129	20	199	-10	189	171	
130	20	183	-9	174	168	
131	20	170	-8	161	166	
132	20	158	-8	150	165	
133	20	147	-7	140	163	
134	20	137	-7	131	162	
135	20	129	-6	122	161	
136	20	121	-6	115	160	
137	20	115	-6	109	159	
138	20	108	-5	103	158	
139	20	103	-5	98	158	
140	20	98	-5	93	157	
141	20	93	-5	89	156	
142	20	89	-4	85	156	
143	20	85	-4	81	155	
144	20	82	-4	77	155	
145	700	97	-5	93	155	
146	700	138	-7	131	155	
147	700	182	-9	173	157	
148	700	230	-12	219	159	
149	700	279	-14	265	162	
150	700	328	-16	311	166	
151	20	331	-17	315	170	164
152	20	295	-15	280	172	167
153	20	265	-13	251	174	169
154	20	239	-12	227	174	170
155	20	218	-11	207	173	171
156	20	.199	-10	189	171	171
157	20	183	-9	174	168	171
158	20	170	-8	161	166	170
159	20	158	-8	150	165	168
160	20	147	-7	140	163	166
161	20	137	-7	131	162	164
162	20	129	-6	122	161	163
163	20	121	-6	115	160	162
164	20	115	-6	109	159	161
165	20	108	-5	103	158	160

APPENDIX B

LA CONTENTA GOLF COURSE
IRRIGATION PLANS

CONSTRUCTION DOCUMENT FOR

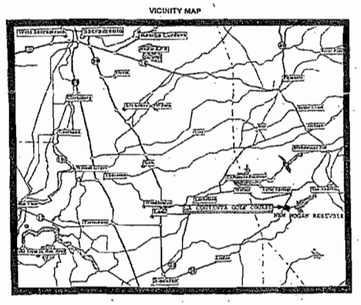
GOLF COURSE IRRIGATION SYSTEM RENOVATION

LA CONTENTA GOLF CLUB

VALLEY SPRINGS, CALIFORNIA

OCTOBER 1999

VICINITY MAP



THE EXISTENCE AND APPROXIMATE LOCATION OF UNDERGROUND UTILITIES OR STRUCTURES SHOWN ON THESE PLANS WERE DETERMINED FROM EXISTING RECORDS. HOWEVER THERE MAY BE OTHER UTILITIES AND/OR STRUCTURES IN THE AREA.

THE CONTRACTOR IS REQUIRED TO TAKE DUE PRECAUTIONARY MEASURES TO PROTECT THE UTILITIES OR STRUCTURES SHOWN AND ANY OTHER UTILITIES OR STRUCTURES THAT MAY BE AT THE SITE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OWNERS OF THE UTILITIES OR STRUCTURES CONCERNED AND CALL USA ALERT 1-800-642-2444 BEFORE STARTING WORK.

CONSTRUCTION CONTRACTOR AGREES THAT IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, CONSTRUCTION CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY; THAT THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS, AND CONSTRUCTION CONTRACTOR FURTHER AGREES TO DEFEND, INDEMNIFY AND HOLD THE COUNTY AND DESIGN PROFESSIONAL HARMLESS FROM ANY AND ALL LIABILITY, REAL OR ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT.

PROJECT SHEET INDEX

REVISIONS	BY

La Contenta Golf Club
IRRIGATION RENOVATION PROJECT
1653 HIGHWAY 26 * VALLEY SPRINGS, CA 95252
TELEPHONE (209) 772-1410 * FAX (209) 772-1085

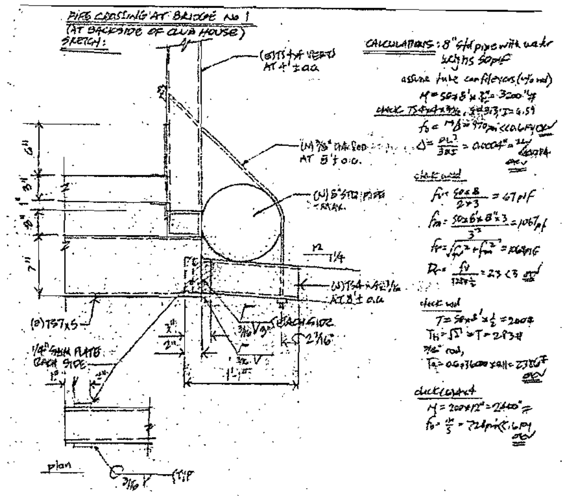
PROJECT TITLE SHEET

David Bigler Associates
Phone: 559 276 9495
Fax: 559 276 9497
davidbigler@aol.com
4335 N. Golden State Blvd. #101 • Fresno, CA 93722

DRAWN	D.B.
CHECKED	D.B.
DATE	9/24/99
SCALE	N.T.S.
JOB NO.	
SHEET	01
OF	10 SHEETS

WEATHERBY REYNOLDS
CONSULTING ENGINEERS
208 PEEK ST., JACKSON CA 95642 (209) 223-0381
(209) 754-1137 FAX # (209) 223-0716

PROJECT: PIPE CROSSING — SHEET NO. 2 OF ___
CLIENT: LA CONTENTA — CALCULATED BY: TEW — JOB NO. ___ — DATE: 9-9-99



WEATHERBY REYNOLDS
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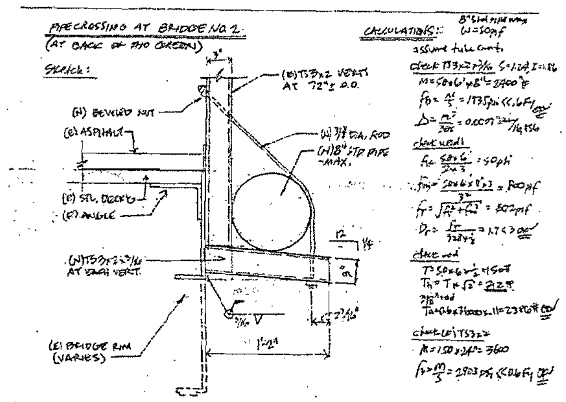
208 PEEK ST., JACKSON CA 95642 (209) 223-0381
(209) 754-1137 FAX # (209) 223-0716

PROJECT: PIPE CROSSINGS — SHEET NO. 3 OF ___
CLIENT: LA CONTENTA — CALCULATED BY: TEW — JOB NO. ___ — DATE: 9-9-99



IRRIGATION LAYOUT PLAN KEY NOTES
PLAN SHEETS 3 & 4 OF 10

01	KEYNOTE #1: Mainline, electrical conduit and communication cable crossing of the bridge between the Clubhouse and 9th green area. All above grade piping is to be ductile iron pipe with mechanical joints (irrigation) with thrust restraints as needed. All above grade conduit for electrical power and communication cable is to be rigid NEC approved electrical conduit strapped to the irrigation mainline pipe. Contractor is to provide all equipment, labor and materials for a complete installation. Contractor is to submit a shop drawing for approval prior to starting work. Contractor is responsible for all cutting and patching of hardscaped surfaces and shall repair any damage to bridge or other improvements caused by their work. Above grade water piping is to be painted lavender for Reclaimed Water use. Touch up paint bridge where contractors work causes surface damage for a neat and clean appearance. See Installation Detail on Plan Sheet 02 of 10.
02	KEYNOTE #2: Contractor is to remove cart path behind clubhouse, install mainline piping, conduits and other improvements and replace the cart path in accordance with the AC Paving Detail located on Plan Sheet 10 of 10. The contractor is to maintain an open passage across the bridge and up one side of the clubhouse cart path at all times. Contractor is to provide all barriers, warning signage and barricades to protect the public health and welfare. Contractor is to coordinate work with the Golf Course Superintendent with a minimum of one week notice given for temporary cart path closure. Contractor is to protect adjacent curbs, walls, pillars and fence adjacent to work area. Contractor is to repair all damage to improvements to remain. No cart path closures are allowed on the weekends. No sleeving required in this area.
03	KEYNOTE #3: Contractor is to sawcut and patch parking lot as needed to installed the referenced mainline irrigation pipe and conduits. See Installation Detail H on Plan Sheet 10 of 10. No sleeving required in this area. Mainline pipe is to be pressure tested and witnessed by the Owner prior to final backfill, compaction and paving operations.
04	KEYNOTE #4: Contractor is to sawcut and patch concrete channel crossing the 1st and 9th fairways. Restore area and concrete channel to original condition and insure that the drainage flow path is maintained. Compact subgrade to 90% relative density prior to replacing concrete that was removed. Match existing layout and finish.
05	KEYNOTE #5: Contractor may install mainline pipe through 9th tee area, or below cart path in area at the contractors option. Contractor is responsible for any demolition work and repair work required for the mainline routing proposed by the contractor in the field. Cart paths are to be saw cut and patched as needed for a complete installation. Contractor is to repair tee areas disturbed and cap disturbed areas with a 2" layer of clean sand and hydroseeded to match existing turf, or as directed by the Golf Course Superintendent. Linear cut/patch of cart path is not permitted. If a pipe runs along the routing of a cart path, the entire cart path along said routing is to be removed and replaced. Only perpendicular, or near perpendicular crossings of cart paths may be cut and patched.
06	KEYNOTE #6: Existing 72" diameter culvert crossing the roadway is to be protected. Contractor is to carefully excavate over culvert for mainline and conduit installation. Alternate routings may be considered in the field to avoid conflicts with the referenced culvert. Contractor is to provide all labor, equipment and materials for a complete installation.
07	KEYNOTE #7: Contractor is to restore grade and rip rap area to existing condition where disturbed by the contractors work. This is typical of other areas that may be encountered by the contractor in the course of their work.
08	KEYNOTE #8: Contractor is to remove cart path crossing, existing 56" diameter culvert and install mainline pipe, conduit and wires at the required depth to install new 36" diameter drainage pipe (Hancor Hi-Q, High Capacity Smooth Interior Pipe HDPE). Contractor is to grade and compact areas as needed to replace cart path section previously removed. Contractor is to grade a slight dip in the new section of cart path over the drainage pipe to create an "overflow" channel, to direct water to lake in the event of high flow conditions. Contractor is to compact and install a three inch thick conrete slurry with embedded rip rap over all disturbed slope areas and drainage pipe entry and exit points. Contractor is to haul all unwanted materials and debris off site at contractors expense. (Existing culvert pipe is appr. 20' long, Contractor to verify)
09	KEYNOTE #9: Contractor is to remove cart path crossing, existing 36" diameter culvert and install mainline pipe, conduit and wires at the required depth to install new 36" diameter drainage pipe (Hancor Hi-Q, High Capacity Smooth Interior Pipe HDPE). Contractor is to grade and compact areas as needed to replace cart path section previously removed. Contractor is to grade a slight dip in the new section of cart path over the drainage pipe to create an "overflow" channel, to direct water to lake in the event of high flow conditions. Contractor is to compact and install a three inch thick conrete slurry with embedded rip rap over all disturbed slope areas and drainage pipe entry and exit points. Contractor is to haul all unwanted materials and debris off site at contractors expense. (Existing culvert pipe is appr. 20' long, Contractor to verify)
10	KEYNOTE #10: Contractor is to remove existing culvert (approximately 180 lf) crossing the 5th fairway at the base of the slope. Contractor is to install mainline piping, conduits and wiring at the required depth to install new 36" diameter drainage pipe (Hancor Hi-Q, High Capacity Smooth Interior Pipe HDPE). Contractor is to grade and compact areas as needed to repair fairway and hydroseed damaged turf areas. Contractor is to match existing grades and install a three inch thick concrete slurry with embedded rip rap over all disturbed slope areas and drainage pipe entry and exit points. Contractor is to haul all unwanted materials and debris off site at the contractors expense. Contractor is to field verify prior to bidding.
11	KEYNOTE #11: Contractor is to saw cut and remove required area of small concrete lined pond area adjacent to roadway area to install mainline, conduit and wires as required. Protect cart path crossing and concrete drain box adjacent to cart path crossing. Replace concrete and embedded river rock pond area to match existing. Contractor shall install a 2" manual fill valve for the small pond on the road side of the cart path crossing installed in a 10" round lavender valve box. Contractor is to haul all unwanted materials and debris off site at the contractors expense. Contractor is to field verify prior to bidding.
12	KEYNOTE #12: SUBDIVISION ROAD CROSSING NOTE: Contractor is to contact the La Contenta Homeowners Association, Mr. David Ferril at (209) 956-5660, 48 hrs prior to starting any road crossing work. Road closures shall not last more than a 24 hour period. Contractor is to supply all warning devices, barricades and flag men required by Caltrans Standard Specifications. All pipes and wires are to be sleeved under the roadway. Wires and pipes are to be sleeved separately. All road trenching work and repavement shall conform with the Calaveras County specifications. Contractor is to guarantee road crossings for a period of one year from the date of final acceptance by the Owner. Roadways must have at least two access routes to close the entire roadway, otherwise at least one lane of traffic must remain open at all times. Contractor is responsible to provide all labor, equipment and materials for a complete installation. Contractor is to verify existing utilities prior to starting work
13	KEYNOTE #13: Contractor is to remove existing culvert (approximately 50 lf) crossing a portion of the 12th fairway. Contractor is to install mainline piping, conduits and wiring at the required depth to install a new 18" diameter drainage pipe (Hancor HI-Q, High Capacity Smooth Interior Pipe HDPE). Contractor is to grade and compact areas as needed to repair fairway and hydroseed damaged turf areas. Contractor is to match existing grades and install a three inch thick concrete slurry with embedded rip rap over all disturbed slope areas and drainage pipe entry and exit points. Contractor is to haul all unwanted materials and debris off site at the contractors expense. Contractor is to field verify prior to bidding.
14	KEYNOTE #14: Mainline, electrical conduit and communication cable crossing of the bridge between the 10th green and 11th tee area. See KEYNOTE #1 for additional details. See Installation Detail on Plan Sheet 02 of 10.

IRRIGATION LAYOUT PLAN LEGEND
PLAN SHEETS 3 & 4 OF 10

	Toro #734-06-35-6, 730 Series Golf Sprinkler with 27.4 gpm @ 65 psi, full circle, 1" inlet with 11/4" swing joint, 65 psi pressure regulation electric VIH sprinkler. All sprinklers are to have optional lavender color cap indicating use of reclaimed water. See Manufacturers Installation Instructions & Installation Detail F on Plan Sheet 10 of 10.
	Toro #765-06-66-6, 760 Series Golf Sprinkler with 26.6 gpm @ 65 psi, part circle 1" inlet with 11/4" swing joint, 65 psi pressure regulation electric VIH sprinkler. All sprinklers are to have optional lavender color cap indicating use of reclaimed water. See Manufacturers Installation Instructions & Installation Detail F on Plan Sheet 10 of 10.
	Toro #765-06-63-8, 760 Series Golf Sprinkler with 14.8 gpm @ 65 psi, part circle 1" inlet with 1" swing joint, 65 psi pressure regulation electric VIH sprinkler. All sprinklers are to have optional lavender color cap indicating use of reclaimed water. See Manufacturers Installation Instructions & Installation Detail F on Plan Sheet 10 of 10.
	Toro #474-24, 470 Series Quick Coupling Valve, 1" two piece, single lug with lavender color cover indicating use of reclaimed water. See Manufacturers Installation Instructions & Installation Detail C on Plan Sheet 10 of 10.
	Mainline Isolation Gate Valve: 4" thru 8": NIBCO #P-619-RW, Resilient Seat Gasketed Joint Gate Valve, 200 psi, gate valves are to be line size as noted on the plan. 10" thru 14": NIBCO #MJ-619-RW, Resilient Seat Mechanical Joint Gate Valve, 200 psi, gate valves are to be line size as noted on the plan. Provide two (2) square operating nut handles to the Owner. See Manufacturers Installation Instructions & Installation Details A & D on Plan Sheet 10 of 10.
	21/2" NIBCO #T-335, Class 150 Bronze Manual Angle Valve, (Putting Green Isolation Valve). See Manufacturers Installation Instructions & Installation Detail J, (where the manual angle valve replaces the manual gate valve and one sch. 80 elbow) on Plan Sheet 10 of 10.
	3" CLA-VAL #624-01, Flanged Globe Float Valve with 24" stainless steel float rod with B-CK2Cock (Isolation Valve), C-CV flow control (Closing) and S-CV flow control (Opening). Automatic lake fill (float valve) is to be installed in a Utility Vault Company #3636-LA, 3'-0" x 3'-0" x 4'-0" I.D. stilling well vault with light traffic steel cover. Contractor is to coat the interior of the vault with approved waterproof sealant. See Manufacturers Installation Instructions & Installation Detail K on Plan Sheet 10 of 10.
	2" CLA-VAL #33A, Air Release and Vacuum Breaker Valve to be installed at high elevations and dead end runs on the mainline piping system. The locations shown on the plan are diagrammatic, and the final installation locations are to be determined in the field based upon the final mainline pipe routing. The Contractor is to submit a shop drawing to the Owner for approval of the installation locations prior to installation. See Manufacturers Installation Instructions & Installation Detail E on Plan Sheet 10 of 10.
	Class 200 SW PVC Pipe. All unlabeled submain pipes are to be 2". All submain putting green loop pipe is to be 21/2". All PVC pipe is to be purple in color that is integral to the plastic and marked on opposite sides to read "CAUTION: RECLAIMED WATER, DO NOT DRINK" in intervals not to exceed three (3') feet. Install all pipe in strict accordance with manufacturers instructions, using the appropriate cement and primer for the various pipe sizes and prevailing conditions. Pipe 3" and smaller in diameter is to be PVC Class 200 SW Pipe as described above. See Manufacturers Installation Instructions & Installation Details A, G & I on Plan Sheet 10 of 10.
	4" thru 12": PW Pipe, PVC TwinSeal, P.R. 200 psi, SDR 21, Gasketed, Iron Pipe Size Mainline Pipe. Size mainline piping as noted on the plan. Install all pipe in strict accordance with manufacturers instructions with concrete thrust blocks at all changes in direction. No bending, or curving of pipe will be allowed, except as permitted by the pipe manufacturer. Pipe manufacturer must be approved prior to ordering materials. 14" Mainline Pipe: PW Pipe, PVC C905, P.R. 235, DR 18, Gasketed, Cast Iron O.D. Pipe Size Mainline Pipe. Contractor is to provide ductile iron transition fittings to smaller IPS size mainlines as needed. See installation notes above. All PVC pipe is to be purple in color that is integral to the plastic and marked on opposite sides to read "CAUTION: RECLAIMED WATER, DO NOT DRINK" in intervals not to exceed three (3') feet. See Manufacturers Installation Instructions & Installation Details A,G & I on Plan Sheet 10 of 10.
	All submain to mainline pipe taps are to be made using Romac ductile plus - double strap service saddles, style #202N, with ductile iron body, nylon saddle, and double stainless steel strap with NIBCO #T-113 IRR isolation gate valve. See Manufacturers Installation Instructions & Installation Detail J on Plan Sheet 10 of 10.
NOT SHOWN	All mainline, and submain pipeline fittings that are four inch (4'), or larger, are to be Harco ductile iron fittings for golf courses manufactured by the Harrington Corporation, or approved equal. All fittings that are three inch (3") or smaller, are to be Lasco schedule 40 or 80 solvent weld fittings, or approved equal. See Manufacturers Installation Instructions.
	Mainline Pipe Discharge Outfall. Contractor is to stub pipe as indicated on the plan with 100 sq.ft. of a 3" thick concrete slurry with embedded rip rap for erosion control. Configure the embedded rip rap to maximize erosion control protection for each location.
POC #1 POC #2 POC #3	Point of Connection #1: Connect to existing 14" discharge mainline from main pump station be removing existing 14" ductile iron tee and install a 14" ductile iron 90 degree elbow. Point of Connection #2: Connect to existing discharge mainline from 40 HP pump station. Point of Connection #3: Connect to existing discharge mainline from 30 HP pump station.
PUMP NOTE	All Pump Stations are existing and no pump station work is included in this contract. The Contractor is responsible to connect the irrigation mainline piping to the discharge side of the three existing pump stations. Contractor is to provide all ductile iron fittings and adaptors required for a complete connection. Contractor is to protect existing pump stations from damage during construction.

GENERAL NOTE: The contractor is to supply all equipment, materials and labor (except as specifically noted to be supplied by Owner) to provide a complete and operational system. Additional equipment and materials in addition to the system components listed in the legend may be required to provide a complete and operational system. The manufacturers installation instructions and details are considered part of the plans and specifications.

IRRIGATION STAKING NOTE: Staking of the irrigation sprinklers is to be done by Owner. Contractor shall coordinate work area with Owner to determine sequence and timing of sprinkler staking operations. Contractor is to give Owner 5 days notice that additional staking will be required for a given area. Contractor is responsible for cutting cup holes to replace Owner flags to more permanently mark sprinkler locations. Contractor is responsible for staking of mainline pipes and other improvements as required.

RECLAIMED / EFFLUENT WATER NOTE: The Contractor is to comply with the "GUIDELINES FOR DISTRIBUTION OF NON POTABLE WATER" California - Nevada Section of the American Water Works Association and the "GUIDELINES FOR ON-SITE RETRO FIT OF FACILITIES USING DISINFECTED TERTIARY RECYCLED WATER, 1997" California - Nevada Section of the American Water Works Association. Contractor is to use lavender color markings on all components of irrigation system possible, including valve boxes, sprinkler covers, quick coupler covers, lavender color piping and other components available for use with Reclaimed Water Systems. Golf Course signage for pump stations and lakes is to be provided and installed by Owner. Contractor is to provide training needed to contractor employees for safety precautions outlined by the California - Nevada Section of the American Water Works Association.

IRRIGATION CONTROL PLAN LEGEND
PLAN SHEETS 5 & 6 OF 10

	Toro SitePro Central Computer Controller System to be provided & installed by the Owner. Contractor is responsible to install the communication cables to the central computer located in the Golf Course Superintendents office. Computer programming is the responsibility of the Owner. The Contractor is to complete data sheets for each satellite controller to assist Owner with computer data base entry. Owner to provide blank data base sheets to Contractor to collect data base field information.
A2	Toro # LTCP-64-P-6-M-4, 64 Station Network LTC Plus field satellite controller with plastic pedestal, large capacity terminal blocks, manual on/off station switches and gold level surge protection. See Manufacturers Installation Instructions and Installation Details L & M on plan sheet 10 of 10.
	Toro Network LTC Standard Armored Direct Burial Communication Cable, (2 signal wires), as manufactured by Paige Electric Co., # P7162D-A. The communication cable is to be continuous without splices between satellite controllers and the central computer. No splices are allowed other than direct connection of the cable to the individual satellite controllers. Any non-armored communication cable for any use is to be installed in the appropriate size conduit. The minimum size conduit is 1". Contractor is responsible for the final connection of communication cables to the central computer. This includes cut & patch of the sidewalk adjacent to the Golf Superintendants office and conduit required to enter building to the central computer location. See Manufacturers Installation Instructions.
	Watertronics Standard Armored Direct Burial Communication Cable, (4 signal wires), as manufactured by Paige Electric Co., # P7171D-A. The communication cable is to be continuous without splices between the main pumping station panel and each of the two remote pumping stations. Leave twenty foot coil of cable at each location for future use. No splices allowed.
	Satellite Controller Geographical Boundary, all sprinklers located within the geographical boundary are to be wired to the satellite controller within said geographical boundary. Station numbers are to be sequentially numbered from tee to green as directed in the field by the Golf Course Superintendent.
Single Head Control Double Head Control Triple Head Control	Diagrammatic Station Grouping. Each of the sprinklers grouped together are to be connected to the satellite controller located within the given geographical boundary and controller station number as directed by the Golf Superintendent in the field. Grouping of wires into station bundles is only to be done in one of the wire vaults adjacent to the satellite controller. The Irrigation Control Plan is essentially diagrammatic. Each solenoid valve (VIH sprinkler) is to have its own dedicated "hot wire" that is continuous, without splices, to the wiring vault adjacent to the satellite controller. The minimum "hot wire" size is 14 AWG. The wire is to follow the submains and mainlines as much as possible. The minimum "common wire" size is 12 AWG. Manifolding of "hot wires" from several sprinklers in the field with a single "hot wire" returning to the wire vault is NOT permitted. See specifications for additional information.

GENERAL NOTE: The contractor is to supply all equipment, materials and labor (except as specifically noted to be supplied by Owner) to provide a complete and operational system. Additional equipment and materials in addition to the system components listed in the legend may be required to provide a complete and operational system. The manufacturers installation instructions and details are considered part of the plans and specifications.

ELECTRICAL POWER SURGE PROTECTION NOTE: The Contractor is to provide and install electrical surge protection equipment on all electrical devices. Surge protection is to be provided for the input electrical supply, low voltage wiring, and communication cable to insure adequate protection from power company electrical surges and lightning strikes. The Contractor is to submit shop drawings to outline surge protection measures for approval by the Owner.

REVISIONS	BY

La Contenta Golf Club
IRRIGATION RENOVATION PROJECT
1653 HIGHWAY 26 * VALLEY SPRINGS, CA 95252
TELEPHONE (209) 772-1410 * FAX (209) 772-1085

IRRIGATION LEGEND AND NOTES

David Bigler Associates
4335 N. Golden State Blvd. #101 • Fresno, CA 93722

DRAWN	D.B.
CHECKED	D.B.
DATE	09/24/99
SCALE	N.T.S.
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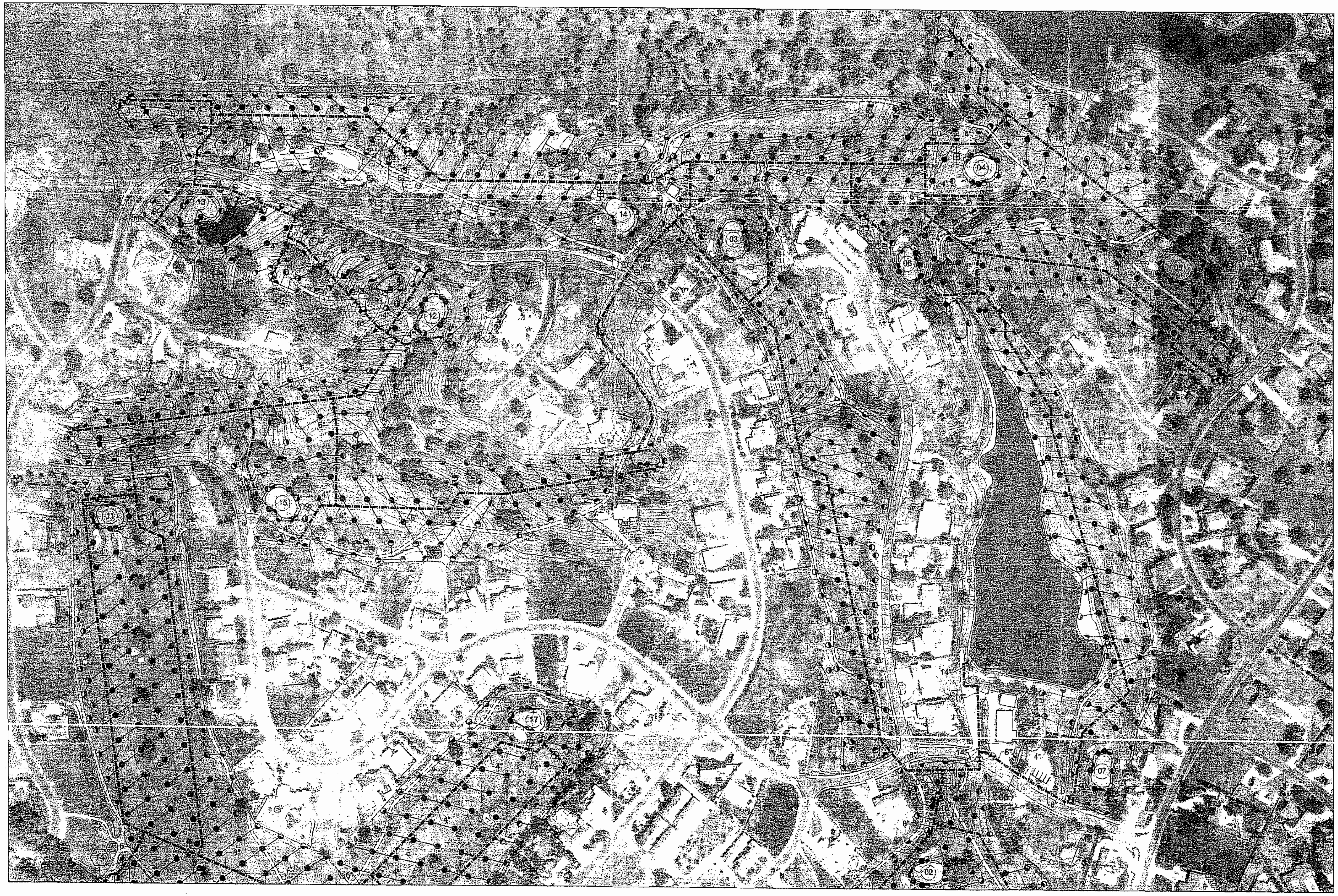
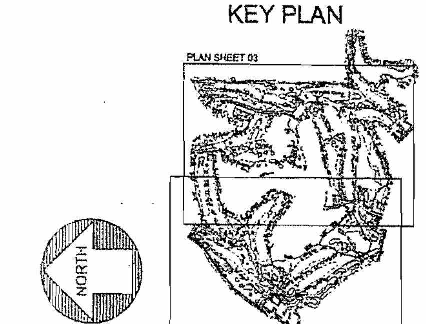


KEY PLAN



REVISIONS	BY

La Contenta Golf Club

IRRIGATION RENOVATION PROJECT

1653 HIGHWAY 26 * VALLEY SPRINGS, CA 95252

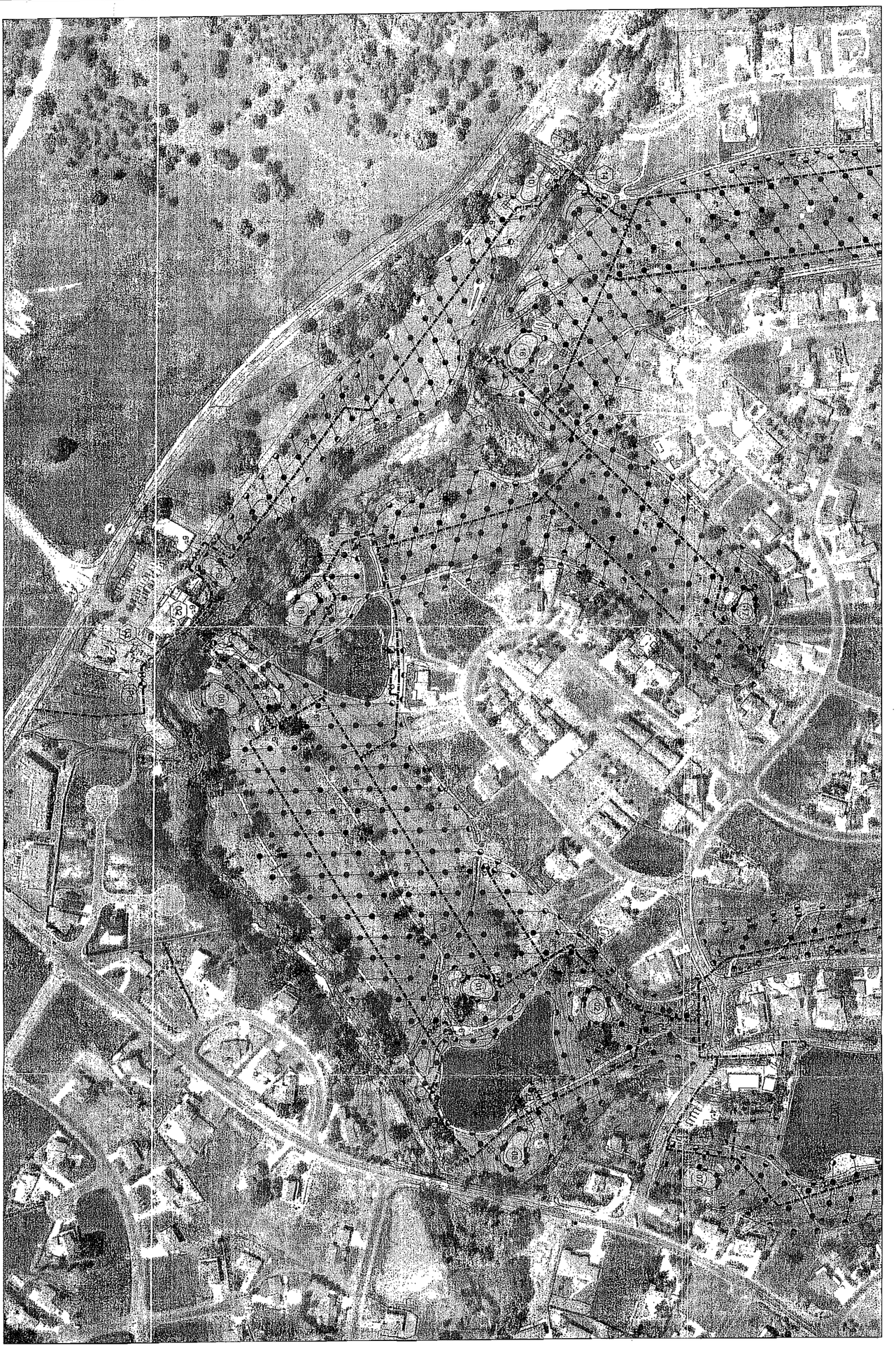
TELEPHONE (209) 772-1410 * FAX (209) 772-1085

IRRIGATION LAYOUT PLAN

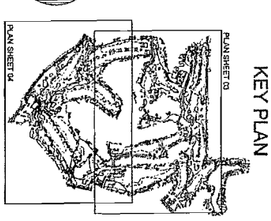
PARTIAL SITE PLAN

David Bigler Associates
Phone 559.276.9495
Facsimile 559.276.9497
davebigler@aol.com
4335 N. Golden State Blvd. #101 • Fresno, CA 93722

DRAWN	D.B.
CHECKED	D.B.
DATE	09/24/99
SCALE	1" = 100' - 0"
JOB NO.	
SHEET	03
OF	10 SHEETS



NORTH



KEY PLAN

DRAWN	D.B.
CHECKED	D.B.
DATE	08/24/99
SCALE	1" = 100' - 0"
JOB NO.	
SHEET	04
OF	10 SHEETS

David Bigler Associates
Phone 559.276.9405
Facsimile 559.276.9407
davebigler@aol.com
4335 N. Golden State Blvd. #101 • Fresno, CA 93722

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LaContenta Title 22 Addendum

The following upgrades/additions were made to the LaContenta WWTP since the 2002 Title 22 report.

Tertiary Filtration

An additional filter was added in 2008 which has a capacity of 208 gpm. The filter is a continuous backwash filter with a surface filtration area of 50 sq. ft.

Disinfection System:

Effluent disinfection prior to discharge is achieved by UV disinfection. Current permit requirements stipulate the discharge to storage shall have a 7-day median and daily maximum coliform of 2.2 MPN/100ml and 23 MPN/100 ml respectively.

A Trojan 3000 UV System was installed in 2008. The chlorine contact basin was taken out of service. However it is still available in an emergency. The chlorine contact tank had a rated capacity of 0.2 MGD. The UV system has a design capacity of 0.26 MGD. The design criteria used was from the NWRI Ultra Violet Disinfection Guidelines for Drinking Water and Water Reuse Second Addition. The Peak Dry Weather Flow to ADWF was 3.25. The UV transmittance was 55% minimum; a redundant bank per NWRI guidelines was installed. The design dose of 100,000 ws/cm2. The system is a California Department of Public Health recognized technology. The District recently hired a consultant to perform UV validation testing. The validation testing is complete and the report is being sent toDPH for approval. The system met the design criteria.

The UV system description is the following;

Number of Channels	1
Channel Dimensions	
Length	60 feet
Width	20 inches
Depth	43.5 inches
Number of UV Banks	4(3 ON DUTY,1 STANDBY)
Number of Lamps per Module	6
Total Number of Lamps	96

Sludge Handling

The sludge drying beds were taken out of service and the belt filter press was installed in their place.

Waste activated sludge solids from the activated sludge process are pumped to a concrete –lined sludge lagoon for stabilization and storage prior to dewatering by a belt filter press. The belt press dewaters to a 20% solids concentration. The sludge is stabilized on site for a period of at least 90 days. The sludge is then tested for 503 requirements. Once the sludge meets the requirements for Class B sludge it is hauled to a sludge disposal site for beneficial use.

The 125,000 gallon sludge lagoon is constructed with a floor sloping to a submerged sump, with air diffusers to maintain mixing during sludge withdrawal from a bottom outlet pipe. A manually adjustable overflow outlet enables return of supernatant liquid to the aeration basin via the effluent return pump station.

A two meter Ashbrook belt filter press was installed along with a serpentix conveyor system. Waste sludge is periodically , approximately 1 every two weeks, pumped from the sludge lagoon to the belt filter press for dewatering. The press is only operated at 300 gpm which is approximately 50% of the design capacity.