carollo engineers

Montecito Sanitary District

SITE MASTER PLAN

FINAL

September 2004

carollo engineers

H:\Client\Montecito\6909A00\Div\Rpt\Site Master Plan Report.doc
5575 RUFFIN ROAD, SUITE 200 • SAN DIEGO, CALIFORNIA 92123 • (858) 505-1020 • FAX (858) 505-1015

Montecito Sanitary District

SITE MASTER PLAN

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1.0 INTRODUCTION

1.1 Background

The Montecito Sanitary District provides wastewater collection, treatment, disposal, and biosolids management. The District is located in coastal Santa Barbara County, just east of the City of Santa Barbara. The District's wastewater treatment plant was last expanded in 1983 and has a rated capacity of 1.5 million gallons per day (mgd). The effluent meets all requirements for secondary treatment as well as the requirements set forth in the California Ocean Plan. The highly treated wastewater (effluent) is disinfected and discharged into the Pacific Ocean through an 18-inch diameter ocean outfall at distance of approximately 1,500 feet off shore.

The District's wastewater treatment plant consists of an extended aeration, activated sludge plant. Features of the extended aeration process as compared to other activated sludge variations include a longer hydraulic detention time and a higher mixed liquor suspended solids content. The process operates in a mode referred to as nitrification. Characteristics of this treatment process include a very high quality effluent. The suspended solids left in the effluent are approximately only 10 percent of the permitted limit. The process is also very stable to operate.

The treated effluent is disinfected with sodium hypochlorite, de-chlorinated, and discharged through the outfall to the Pacific Ocean. The waste activated sludge is aerobically digested and dewatered by a belt filter press. The dewatered biosolids are hauled to a remote site for composting.

The plant property is bounded by railroad tracks to the north, the music academy to the east, residential development to the south, and a public street on the west. The location of the treatment processes is generally away from the neighbors. Tall trees and shrubs effectively screen the plant from most public view. Plant impacts on neighbors has not been, and not foreseen to be an issue. Surrounding land use is not expected to change.

The Influent Pump Station requires expansion, and this project is currently being designed. The electrical motor control center for the plant is located within the laboratory. There is no space for the new pump station electrical equipment. The new electrical equipment will be located within the existing shop. The existing motor control center is also reaching the end of its useful life. The present location poses some safety risk to the staff working within the laboratory. It is planned to install the new motor control centers to the existing shop, and this will trigger the need for a new shop on the plant site. There is not sufficient space in the

existing shop for all of the equipment and storage requirements. The District has already budgeted design of the new shop.

Additional levels of treatment are not foreseen. However, wastewater reclamation could occur if water supplies are affected by prolonged drought. The secondary effluent would need to be filtered or treated through fine membrane processes similar to reverse osmosis membranes.

The treatment facilities are well maintained and are in good to excellent condition. However, replacement of the treatment structures on the existing site should be planned for.

In addition to the impact to the shop, covered storage is needed for critical District vehicles. This will extend the life of these vehicles. The new Vac-Con truck (Vac Con) should be parked within an enclosed garage to protect this significant investment from the marine environment. The space could be provided in the new maintenance shop.

1.2 Purpose

Considering that planning has started for a new shop in addition to other potential needs, the District staff foresaw the need to prepare a site master plan. The master plan would consider all potential site uses. The final product would be a plan that will become a footprint for future site development. This planning will assure that the location of the new shop fits with potential future structures.

1.3 Scope of Work

This section describes the Scope of Work that forms the basis of this report. The contact work is described in a series of tasks.

Task 1--Treatment Site Constraint Analysis

Develop space requirements for major treatment programs including the following: 1) rag removal, 2) grit removal, 3) primary clarification, 4) oil and grease removal, 5) aerobic digestion, 6) reclaimed water, 7) wet weather storage, 8) DAFT cleaning, 9) sludge drying bed removal, 10) sludge conveyor, 11) higher levels of disinfection (UV or more contact basin, volume), 12) facility replacement (age) and 13) odor control. Once the space requirements are developed, the Consultant will meet with District staff to present the probable locations and space needs for each. The purpose of this meeting will be to prioritize the treatment needs. It is possible that some of the treatment programs may be deleted from future planning. This would be the result of site limitations as compared to the future treatment benefit.

Task 2--Building Program

Develop a building program for the following functions: 1) electrical motor control, 2) O&M staff offices, 3) SCADA, 4) vehicle storage, 5) adequacy of administrative spaces, 6) locker rooms, 7) kitchen, 8) multi-purpose room, 9) materials storage, and 10) laboratory. The building programs were developed over a three-day workshop at the District offices in early April 2004. The agenda included: 1) initial meeting--gather input and staff needs, 2) develop space needs for various functions, 3) obtain staff review and consensus, 4) develop potential floor plans, and 5) obtain staff review and consensus.

Task 3--Site Plan

Prepare a draft site plan for the potential improvements identified in Tasks 1 and 2. The site plan shall consider 1) public access to the administrative spaces, 2) biosolids removal, 3) chemical deliveries, 4) other deliveries, and 5) space for District truck parking (other than covered). Meet with District staff to obtain comments. Comments will be incorporated into a final report.

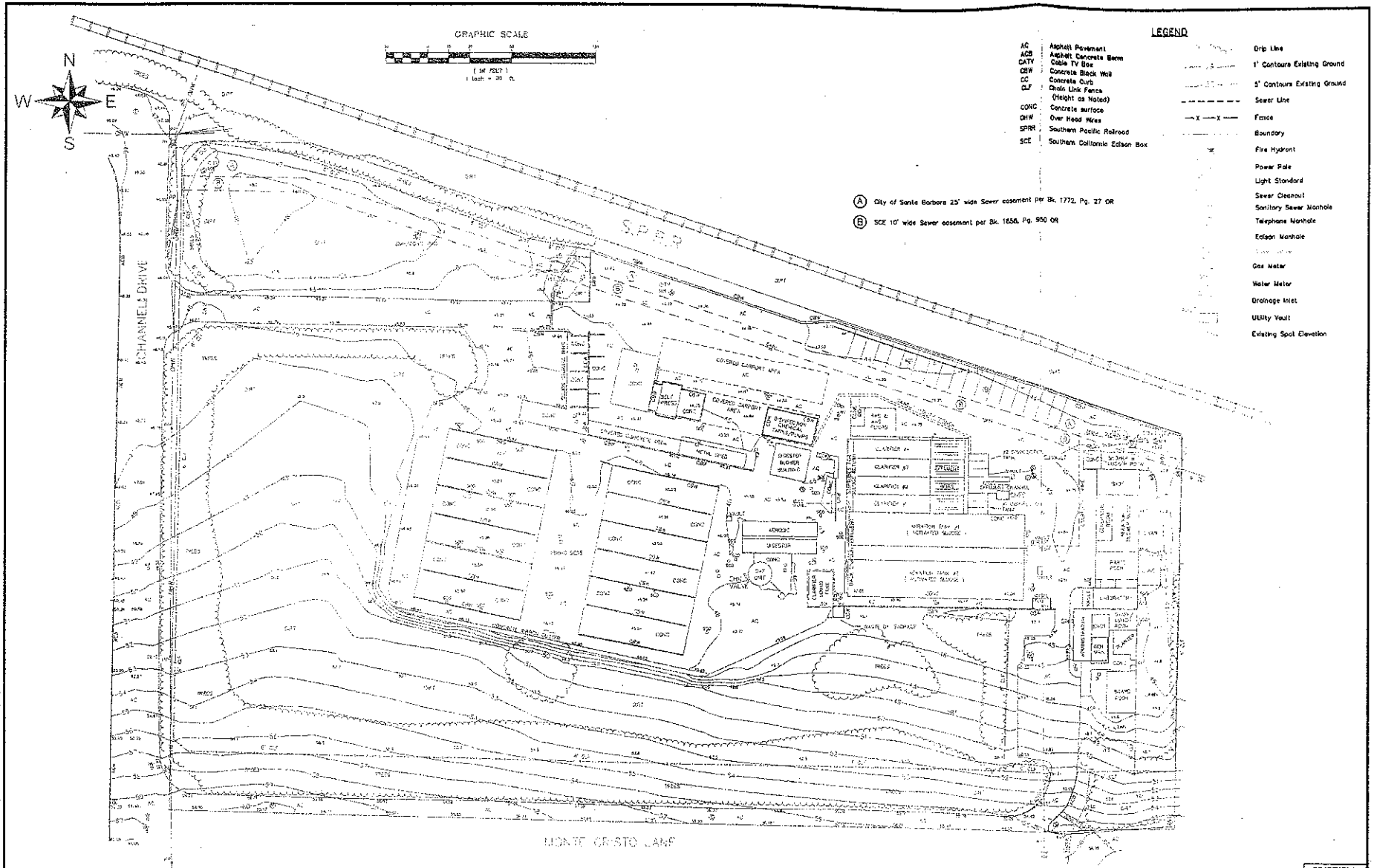
2.0 EXISTING CONDITIONS

2.1 Existing Site

The existing site is shown on Figure 1. It is bound by the Southern Pacific Railroad tracks to the north, the music academy to the east, Monte Cristo Lane to the south, and Channel Drive to the west. Public access is off Monte Cristo Lane. There is off-street parking for visitors and some administration staff. Other District vehicles and delivery trucks use the entrance off Channel Drive. The site covers about 6.5 acres. Less than half of the site is presently utilized. However, the southern portion of the site may not be useable. This is due to the ground slope at this portion of the site. The grade slopes up towards Monte Cristo Lane on the south side. Construction in this area could require expensive retaining walls. This area should also be retained as a buffer for existing neighbors.

There are two easements on the property along the north property line. These are shown on Figure 1 also. One is a City of Santa Barbara sewer easement that is 25 feet wide. The other is a Southern California Edison easement that is 10 feet wide. The power feed to run the treatment plant is located within the Edison easement. The power from Channel Drive runs underground. Construction over these easements is not possible.

The site circulation must allow for large trucks to enter and exit the site. These large trucks include tanker trucks carrying chemicals and trailer trucks that remove dewatered biosolids from the plant. The tanker trucks have a capacity of 5,000 gallons. They are used to deliver sodium hypochlorite and sodium bisulfite that are used in the disinfection process. The biosolids trailer trucks have a capacity of 40,000 pounds.



NO.	DESCRIPTION	DATE	APPROVED
REVISIONS			

DESIGN XXX
DRAWN CMV
CHECKED XXX
QUANTITIES
SHEET NO.
PAGE
ATLAS
PROJECT OWNER

carollo engineers

SITE MASTER PLAN

EXISTING SITE PLAN

MONTECITO SANITARY DISTRICT
1042 Monte Cristo Lane Santa Barbara, CA 93108

Approved: _____ Date _____, 20 _____
General Manager

Scale:
Vert _____
Hor _____
Sheet ___ of XX

During Carollo Engineers site visit of April 13, 2004, we observed a chemical truck entering and leaving the site. The room to turn around is shown on Figure 2 as shown. The site is restricted with respect to truck and trailer maneuvering. The northeast corner of the plant needs to be reserved for truck turn-around. Note that the trailer trucks are too large to enter and exit the site off Monte Cristo Lane. In any case, truck traffic through this entrance would also lead to other neighbor traffic impacts.

2.2 Existing Treatment

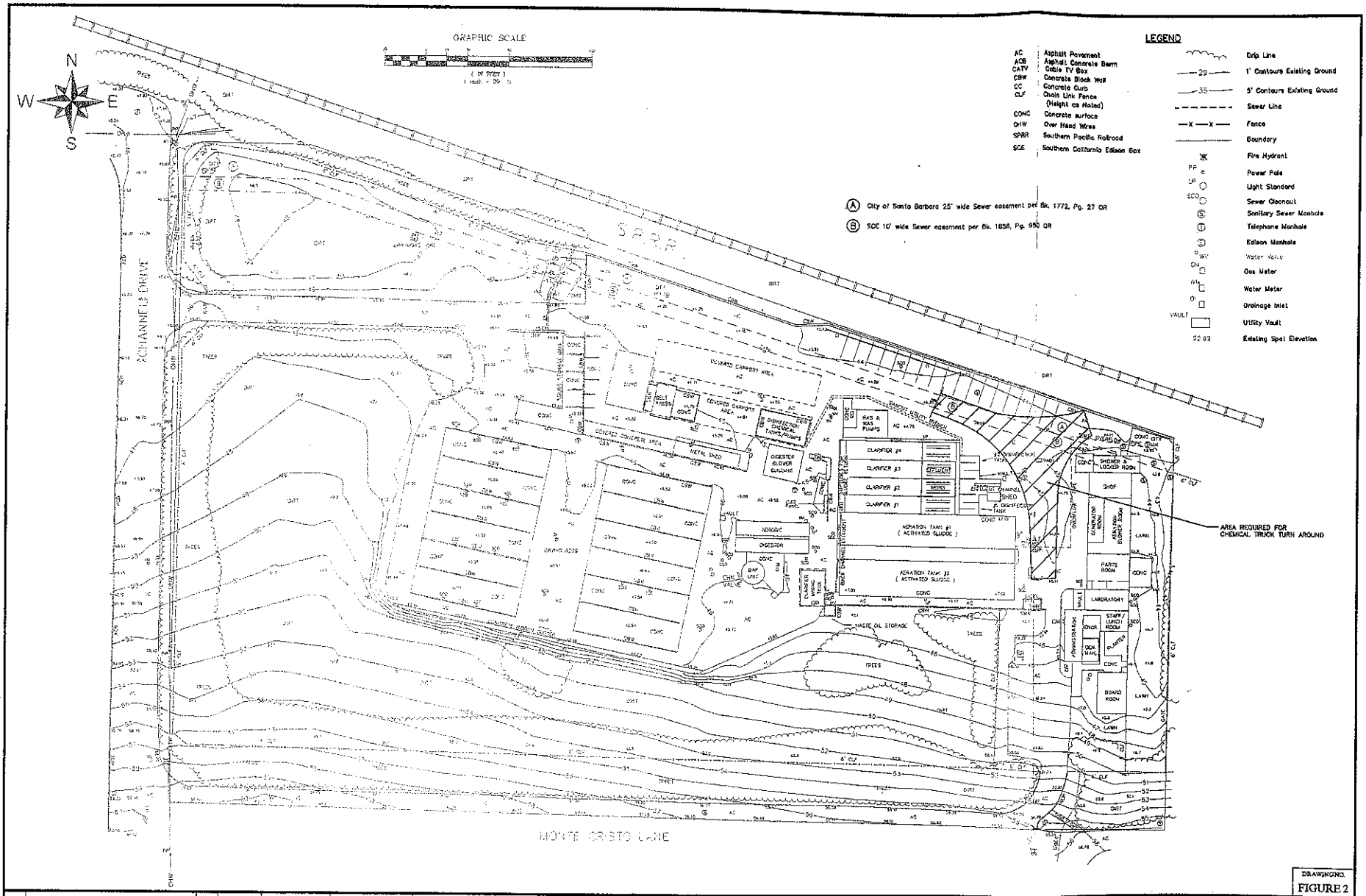
2.2.1 Overview

Treatment includes preliminary treatment, secondary treatment, disinfection, and biosolids stabilization and dewatering. As discussed previously, the secondary treatment process used at the plant is referred to as extended aeration. The wastewater is held in the two aeration basins for about 12 hours. This is about twice the time for a "conventional" process. Conventional processes are usually preceded by primary clarifiers. The extended aeration process usually eliminates the need for primary clarifiers. While this reduces capital costs and space needs, it can result in other operational issues. Primary clarifiers remove grease, oil, and other floatables from the waste stream. In an extended aeration plant, the grease and oil travel through the process and can affect the aesthetic quality of the effluent, as well as increase operations costs. This issue is described in subsequent sections.

2.2.2 Preliminary Treatment

The preliminary treatment process is located beneath the existing maintenance shop. Preliminary treatment includes rag grinding and pumping. Rag grinders shred the material, and the shredded material returns to the waste stream. The shredded rags tend to re-form. This is referred to as "roping." This also causes additional maintenance in the downstream processes. This is a deficiency of the current rag removal process.

Most wastewater treatment plants include a step referred to as grit removal. Grit consists of sand and other particles that can settle in downstream pipes and channels. There is no grit removal at the Montecito plant. This is a second deficiency in the preliminary treatment process that results in additional operator time as compared to a plant with grit removal.



DRAWING NO.
FIGURE 2

NO.	DESCRIPTION	DATE	APPROVED
	REVISIONS		

DESIGN XXX
DRAWN CMV
CHECKED XXX
BID NO.
PAGE
ATLAS
PROJECT ENGINEER
MANAGER

carollo engineers

SITE MASTER PLAN

CHEMICAL TRUCK TURN AROUND

MONTECITO SANITARY DISTRICT
1042 Monte Cristo Lane Santa Barbara, CA 93108

Approved: _____ Date _____, 20 ____
General Manager

Scale:
Vert _____
Hor _____

Sheet ___ of XX

2.2.3 Secondary Treatment

Aeration Basins

From the preliminary treatment step, the wastewater is pumped into the two aeration basins. The wastewater and returned activated sludge is combined in a "splitter box" at the east end of the basins. Weirs are used to evenly split the flow.

The peak influent flow rate is limited by hydraulic losses in the splitter box. It is reported that the water surface elevation in the box reaches the top when influent flows reach 2.8 to 3 mgd. The return activated sludge (RAS) is also pumped into this box for distribution between the two basins. The RAS flow rate is in addition to the influent flow reported above. District staff have identified and will implement a plan to overcome the hydraulic limitation.

The aeration system consists of coarse bubble diffusers installed on swing arms down the length of each basin on one side. The swing arms can be raised for maintenance and cleaning.

The aeration basin is operated in a nitrification mode. The effluent ammonia concentration is reported to be less than 1 milligram per liter (mg/L), which represents almost complete nitrification. The process is controlled based on maintaining a maximum mixed liquor suspended solids concentration of about 3,500 mg/L. Higher concentrations are reported to cause settling problems in the secondary clarifiers. This is probably due to solids loading limitations coupled with the relatively shallow clarifier depth (11 feet). Current design practice is to construct secondary clarifiers with a depth of at least 14 feet. This reduces the chance of solids carry-over at the effluent weirs. The operation and aeration basin size are well within accepted design standards. The level of operational skill exceeds most plants.

The lack of sufficient rag and grit removal reported above results in above normal operator attention. Rags wrap around the diffuser headers and arms, especially on the first two headers. The swing diffusers are then rotated out of the basins for cleaning. This operation requires two persons for two days about every two months.

Operations staff schedules a complete cleaning of the basins every year. If staff time is limited, the frequency is sometimes extended to 2 years. It appears that Aeration Basin No. 2 collects more grit. Approximately 15 cubic yards of grit were removed the last cleaning. Aeration Basin cleaning requires six persons for an entire week. This level of cleaning would not be required if grit removal were provided. Normal grit removal requires no more than 1 hour per day.

The effluent channel is another area that collects grit. The channel is four feet deep, and considering the flow rates, the velocity allows additional grit deposition. This channel is cleaned once a year. It requires five persons for one full day.

The aeration basins are generally in good condition. The main air header was constructed using ductile iron pipe. It has corroded and one leak was observed. This results in some additional power consumption. The tops of the aeration basin walls show some cracking. These cracks should be sealed with an epoxy system. It is reported that the cracks have been injected with epoxy in the past, and the sealing was not effective. Other products or techniques should be implemented.

Secondary Clarifiers

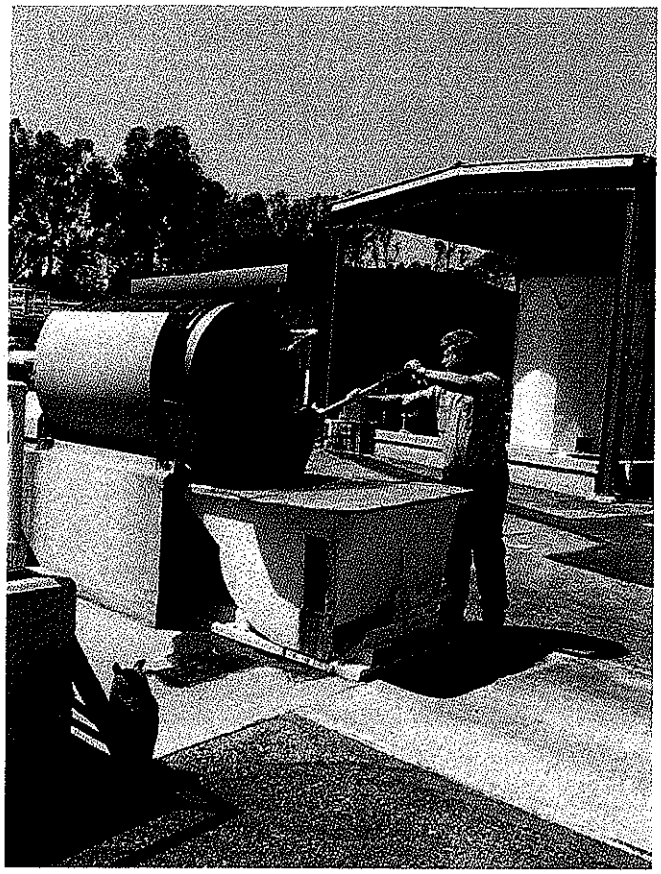
There are four, rectangular secondary clarifiers. The basins are sized conservatively with respect to accepted design practices. The settled mixed liquor is collected back to the influent end of the basin using chain and flight collectors. It appears that the original chain and flight system has already been retrofitted with fiberglass flights, plastic chain, and UHMW wear strips.

Scum removal is done with manual tipping troughs. There was virtually no foam or scum evident on the surface of the clarifiers. The only material on the surface was floating grease, oil and other floatables. This floating material is typical of extended aeration, activated sludge plants that do not utilize primary clarifiers.

Rag removal is still a problem at the secondary clarifiers. Rags collect on the telescoping valves that control sludge removal from the bottom of the clarifiers. It is reported that secondary clarifier rag removal requires one and one-half hours per day. Grit collection can also be a concern in the individual sludge hoppers. If grit is allowed to collect, sludge removal ceases, and this could lead to a high sludge blanket and solids carry-over to the ocean outfall.

Sludge Pumping

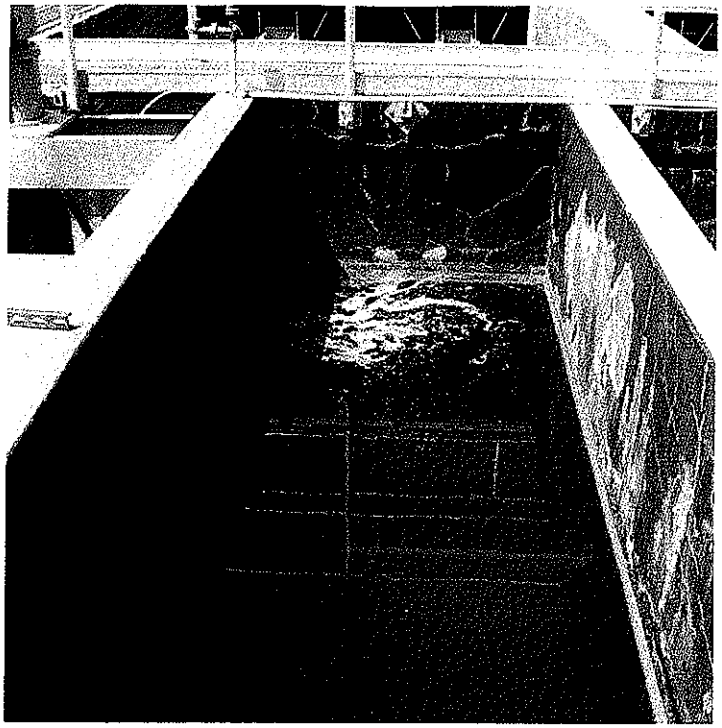
There are two pumping systems related to the secondary treatment process. These include return activated sludge and waste activated sludge pumping. To help assist in rag, grit, and grease and oil removal, a fine screen has been installed. The return activated sludge is pumped through the screen during the normal daily shift. The removed materials are placed on the sludge beds for drying. This operation would not be required with the addition of better rag removal. This operation takes one hour per day.



The RAS is screened to remove rags and other materials that are not properly removed by the grinders. This requires one hour per day of operator attention.

2.2.4 Disinfection

Disinfection is accomplished by first adding sodium hypochlorite to the settled wastewater. The hypochlorite is one form of chlorine that kills pathogens and virus. The wastewater then enters the contact basins. There are two chlorine contact basins. They provide a total of 30 minutes of detention time at the average design flow of 1.5 mgd. Floating grease is also evident on the surface of the contact basins. This could possibly result in violations of the effluent grease limit of 75 mg/L maximum day. This has not occurred to date. This is due in part to the additional labor on the part of the operations staff. A swimming pool net is used to manually clean the surface of the basins. This takes approximately one hour per day. It is done normally during the morning.



Grease and oil can travel through the entire treatment process. Here it floats on the surface of the chlorine contact basin.

The disinfection process must reduce the pathogens as reported as total coliform to a limit of 23 most probable numbers per 100 milliliters (100 MPN/100 ml). While staff can meet this limit consistently, conformance requires a high sodium hypochlorite dose. This in turn consumes additional sodium bisulfite to remove the excess chlorine prior to discharge to the ocean outfall. Staff also reports difficulties in meeting the limit during high wet weather flows. The chlorine contact chamber volume is marginal for current flows.

2.2.5 Biosolids Handling

Dissolved Air Flotation Thickener (DAFT)

The waste activated sludge is pumped to the DAFT. Wasting is done during the normal 8-hour shift. It is reported that the thickened waste activated sludge is approximately 3 to 3.5 percent solids. This is considered as a very good solids concentration considering polymer is not utilized.

The DAFT is cleaned once a month to remove rags and grit. This cleaning requires one person for one day. The DAFT is emptied to one of the sludge drying beds. When the DAFT is cleaned, odors are often reported. The cleaning is required for both grit and rag removal. Rags can catch on the pressurization back-flow control valve. When this occurs, additional

manpower is used. Addition of a drain pump and a source of secondary effluent for flushing would reduce the cleaning time.

Aerobic Digesters

The thickened waste activated sludge is pumped to the two aerobic digesters. The sludge is held in the digesters until it is dewatered by the belt filter press. The solids content in the digesters was approximately 2.5 percent during March 2004. The minimum temperature was slightly below 20 degrees Celsius.

The two digesters have a combined volume of 110,000 gallons. At current plant flows, the waste activated sludge is held in the digesters for about 14 days. This holding time is not sufficient to meet the Environmental Protection Agency's definition for Class B biosolids. Class B biosolids can be directly land applied as a soil amendment. The Class B rating is not required at this time. The biosolids are composted to a Class A level at a facility in Kern County. However, if this facility ceased operation, the District would have to dispose of the biosolids in an approved landfill or enter a contract with another composting operation.

To meet Class B requirements, the digester volume would need to be tripled. This potential need should be considered in the site planning.

Dewatering

The biosolids are periodically pumped from the digester to the belt filter press for dewatering. The solids are concentrated from about 2.5 percent solids to about 15 percent solids, greatly reducing the amount of water that needs to be hauled off site. The concentrated biosolids are lifted from the belt filter press into a dump truck. When full, the truck is emptied into the storage bins just to the west. This is an additional handling step. It also requires the dedicated use of a dump truck. The press is run two to three times per week. The dump truck is filled twice during one dewatering operation.

Every 1 1/2 to 2 weeks, biosolids are loaded into a tractor-trailer for hauling off-site. This operation requires loading the stored biosolids with a tractor. After loading, the entire area needs to be cleaned up. The loading and the cleanup operations require 3 hours for one person. District staff will shortly implement modifications to this operation to eliminate double handling and reduce cleanup time.

Drying Beds

The plant was originally constructed with drying beds to remove the water from the biosolids by drainage and evaporation. These beds are now used only for the DAFT cleaning and one rotary screen material drying. Much of the drying bed area can be used for other purposes.

2.2.6 Wet Weather Storage

During peak storm events, the wastewater flow can increase dramatically due to storm water entering manholes. This high flow can stress the treatment processes. Wet weather storage is desirable. Currently, there is no weather storage. The portion of the high flows above 3 mgd should be diverted to a storage basin designed and constructed for wet weather storage. After the storm flows subside, the stored wastewater would then be returned to the plant for treatment and disposal.

2.2.7 Summary

As discussed above, the overall treatment process generally meets all accepted design standards. Several deficiencies have been noted. These should be considered as candidates for future site master planning. The major treatment deficiencies include:

- Enhanced Rag Removal
- Grit Removal
- Oil and Grease Removal
- Improved Disinfection
- Class B Biosolids Production
- Enhanced biosolids Handling (District staff will implement shortly)
- Wet Weather Storage

The rag and grit removal may be justified based on the current operator attention needed in these areas. The added operations hours are summarized in the following table.

Table 1 Grit and Rag Removal Operation Hours
Site Master Plan
Montecito Sanitary District

Plant Area	Cleaning Frequency	Hours Each Cleaning	Hours Per Year
Aeration Basin Diffuser Rags	Bi-monthly	32	192
Aeration Basin Grit	Annual	240	240
Aeration Basin Channel Grit	Annual	40	40
Secondary Clarifier Sludge Withdrawal Rags	Daily	1 1/2	548
Sludge Screening	Daily	1	365
DAFT Thickener	Monthly	8	96

The above operations add 1,481 hours per year to the staffing needs. This represents almost one operator full-time with an annual salary cost including benefits of approximately $70,000. Properly designed facilities should not require more than one man-hour per day for both operations and maintenance. The other deficiencies listed above are discussed in more detail in Section 3.0.

2.3 Organization and Staffing

2.3.1 Organization

The current organization chart is shown on Figure 3. There are three major functions within the District. These include Administration, Operations and Maintenance, and Engineering. Each of these functions report to the General Manager. Copies of forms used in the interviews with District staff are included as Appendix A.

Administration

The administration staff now consists of two persons. Future space requirements should consider adding one position. This is not a current staffing need. However, planning should allow for future District functions and needs.

The current work area would be generally large enough if the Operations and Maintenance Manager had a separate office. The O&M Manager moved into the front administration space when the position was created. This space is needed for office equipment such as the copier.

There is insufficient space for the O&M Manager in the existing area. The O&M Manager also requires a private office to conduct personnel matters. It is reported that the public area and counter space is adequate.

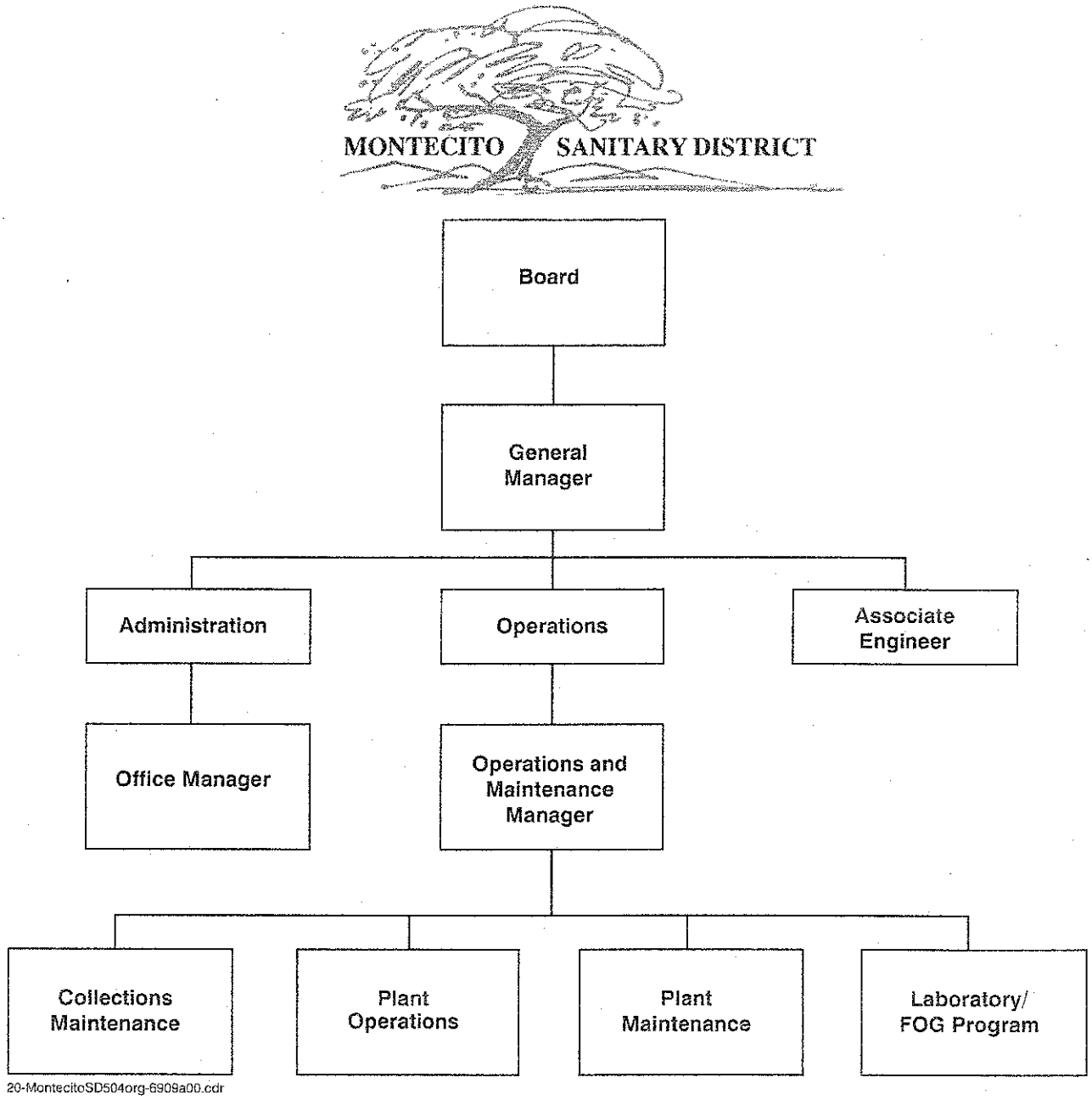
A common area for the copying machine, plotter, fax, and office supplies would be ideal. This area would be shared by all staff.

Parking is sufficient most of the time. Overflow is sometimes accommodated in the plant parking area.

Operations and Maintenance

As discussed above, a private office is needed for the Operations and Maintenance Manager. This is needed based on responsibility and number of persons that report to him. Furniture needs include a desk, a work area to do monthly reports (table or other flat area), two lateral file cabinets, two computers (one SCADA), and four lineal feet of bookcases. Separate SCADA computers are required from the network or office-based computer. The Manager deals with all of the departments. However, 80 percent of the duties are administrative.

Figure 3
District Organization Chart



Operations

There are two operator positions. Each operator requires a workstation. Eight feet of bookcase would be sufficient for the operations and laboratory area. One computer station and one SCADA station is necessary. Two lateral file cabinets are required for records.

Laboratory

For today's needs, the laboratory workbench area is about two-thirds of what is required. If the existing operator and maintenance personnel work stations and motor control centers were relocated, there would be sufficient space available. Much of the shortfall is glassware and sample preparation. The existing single fume hood is sufficient.

The only identified future testing need is the ability to perform bacteriological testing in the laboratory for total coliform. This test is now done by a private laboratory. The turn-around time for the results is not fast enough to assure that the disinfection dose is producing effluent meeting the requirement of 23 MPN/100 ml total coliform. This testing would require space for one autoclave and two incubators. Space is also needed for sample preparation. Ten feet of cabinet space is needed. This needs to be separate from the other work areas.

There is no need for a dedicated area to store the ISCO samplers. There may be a need for a separate refrigerator in the future to store the collected samples. This added need would result as part of the fat, oil, and grease (FOG) program. The existing refrigerator space is very limited when the ocean water quality testing is performed.

The laboratory position needs a dedicated workstation. This will require a computer. There is also one common computer for the lab.

The laboratory has a hand held eyewash but no emergency shower. An emergency eyewash and shower should be installed.

Operations Maintenance

As discussed above, design for the new maintenance shop will start soon. The need for the shop is two-fold. One, there is no separate area for welding. The District's insurance adjuster noted that welding was occurring near the solvent storage tanks. The second need is to free space for the motor control center replacement.

There are two operations maintenance positions. If a SCADA program is instituted, a full-time instrumentation technician may also be required. This third position should be considered in space planning. The personnel could share a common office. This would include space for files and catalogues.

Furniture needs include a lateral file cabinet and 12 feet of lineal feet of bookcase. One computer would be adequate for the positions. A computer printer is also needed. A separate copying machine is not required. A table for opening plans is required.

Future maintenance equipment includes a hydraulic press, a plasma cutter, and mig welder, an abrasive blast cabinet, ventilation system for welding, and a combination wood saw. The workbench length needs to be on the order of 100 lineal feet.

The new building would include two working bays. One would be large enough for the Vac-Con storage. The parts storage needs to be in a separate secure room. The current solvent storage can stay in its present location.

Collection Maintenance

There are three personnel in collections maintenance. A fourth position is shared between collection maintenance and operations, depending on the workload and particular operation.

All the tools and equipment are stored in the vehicles. There are four vehicles, the Vac-Con, a water truck, the sewer televising truck, and a line truck with cones, safety devices, etc. The Vac-Con does not have covered storage at this time.

The collections maintenance staff spends most of their time in the field. The crew does not normally return for lunch. The staff does use the locker and shower facilities at the end of the day.

A common workspace would be sufficient for Collections Maintenance. Three workstations are desired. These would consist of desks for storage of work and personal items. A fourth workstation is needed for the computer and printer.

A bookcase is needed for catalogues and other reference materials. File cabinets are required. Videotapes will be converted to DVD's. There is not a great deal of space required when this conversion is made. A table is needed to layout and review the sewer atlas. For a combined Operations and Collections Maintenance Building, there is an opportunity to share space for plan layout tables. This will result in some cost savings.

Collections maintenance staff does not require a dedicated copier or fax machine.

Engineering

There is one Assistant Engineering position. The existing space is reported to be sufficient. The District is currently hiring a contract inspector for field construction. There may be a need to hire a full-time inspector in the future. Space planning should consider this staffing addition.

General

In addition to the department needs, other requirements were discussed. One significant limitation is the existing locker and shower facilities. There are not enough showers for the number of staff. The locker area is cramped. There are no women's facilities. The District

should plan for a higher proportion of women staff in the future. This could be accommodated by converting the existing men's locker room to a women's locker room. Men would use the new locker room in the Operations and Collections Maintenance Building. Future space planning should take this deficiency into account.

The lunchroom was discussed, and the existing facilities are marginally adequate. There is not sufficient space for the entire staff to eat at one time.

The last need may be on-site housing for an operator. This on-site housing would provide for early response to problems in the plant or collection system. There is a concern that community housing costs may result in future staff having to live too far from the District to provide immediate emergency response. This would be a future program.

3.0 FUTURE NEEDS

3.1 Treatment

This section describes the potential future needs along with the required size and footprint. The potential site layouts are discussed in Section 4.0.

3.1.1 Expansion

The existing plant is rated at 1.5 mgd. Within the District, there are both undeveloped parcels and parcels that are served by individual septic systems. The number of parcels is summarized in Table 2. If all parcels were to be developed, the resulting additional flow would be approximately 200,000 gallons per day. The current flow is approximately 0.8 mgd. The potential future flow of 1.0 mgd would still be less than the rated plant capacity. Therefore, future expansion is not expected.

Table 2 District Parcels for Potential Sewer Connection
Site Master Plan
Montecito Sanitary District

Non-Sewered Parcels	No.	Unit Flow (gpd)	Total Flow (gpd)
Sewer Available	108	250	27,000
Sewers Not Available	434	250	108,500
Unoccupied Parcels	193	250	48,250
			183,750

3.1.2 Preliminary Treatment

Future preliminary treatment needs include rag removal and grit removal. Rag removal could be accomplished with several technologies. One popular technology is the "climber screen". There are no mechanical parts submerged in the wastewater. The clear opening can be as small as 1/4 inch. The overall height of the screen from the water surface to the ground level can be 20 feet or more.

Using a small screen clear opening will also remove fecal matter. Screenings washer/compactors have become very popular to remove this matter from the screenings. The washer/compactor not only returns organic matter back to the flow stream for treatment, the compactor portion can remove more than half of the moisture. This greatly facilitates disposal.

The screenings facilities should be enclosed for vector and odor control. The building size would be approximately 18 by 20 feet in plan view.

The grit removal facilities would include the grit chamber, bypass channels, a below grade grit pumping room, and a separate facility to dewater the pumped grit. There are several grit removal technologies including vortex grit chambers and aerated grit chambers. The space planning is based on the use of the vortex technology. Odor control is also recommended for the grit removal process. The grit removal process requires a footprint of 16 by 70 feet.

3.1.3 Primary Clarification

Primary clarification would consist of rectangular clarifiers similar but smaller in area than the secondary clarifiers. The primary clarifiers would be covered for odor control. The facilities include the clarifiers, primary sludge pumping, scum pumping, and odor control.

Primary clarification would be considered to increase the overall capacity of the plant and to better remove grease, oils, and floatables. The wastewater is held in the clarifiers for about 2 hours. The quiescent conditions allow the heavier solids to settle to the bottom of the tank. They are removed to one end by a chain and flight mechanism. The lighter grease and oils float to the surface. They are removed by scum skimmers.

Primary clarifiers remove approximately 35 percent of the wastewater biochemical oxygen demand and 65 percent of the wastewater suspended solids. This reduces the organic load on the aeration basins, and this would allow the aeration basins to be operated at a shorter detention time. It is possible that the addition of primary clarifiers would allow one aeration basin to be taken out of service. The primary clarifiers would also increase the rated capacity of the aeration basins. However, this is not required based on the flow projections discussed above.

The solids removed from the primary clarifiers and the scum are highly organic. Proper stabilization is required. This could be accomplished in aerobic digesters. However, utilizing aerobic digesters requires high-energy consumption and a significant amount of odor control. The space planning in this report will be based on utilization of anaerobic digesters. This is the most common technology used to stabilize primary and waste activated sludge. The grease and oil removed by the scum system can also be stabilized in the digesters.

The primary clarifier facilities would have a plan area of approximately 50 by 100 feet. The anaerobic digesters would have a plan area of approximately 32 by 110 feet.

3.1.4 Grease and Oil Removal

As discussed above, primary clarifiers would remove grease, oil, and other floatables. An alternative project would be to improve the removal at the secondary clarifiers. The improvements would consist of the following:

- Installation of automated scum skimmers in the secondary clarifiers. Motorized operators would automatically tip to remove scum at operator selected time intervals. Scum removal can be required hourly during the day and less frequently at night. A programmable logic controller would be used to select the desired times. This will improve the removal of scum from the clarifier surface.
- Construction of new baffles downstream of the scum skimmers. The existing baffles appear to allow the scum to travel into the chlorine contact chamber.
- Construction of a separate scum pumping station, just north of the secondary clarifiers. The scum would be pumped directly to the aerobic digesters. This will remove the scum from the system. Now, the scum is recycled through the return activated sludge pumps, to the aeration basin, and back to the secondary clarifiers.

The above improvements do not have a significant space impact.

3.1.5 Disinfection

The current disinfection technology consists of adding sodium hypochlorite to the wastewater and holding it in a contact basin. The degree of disinfection can be reported as either total coliform or fecal coliform. These are indicator organisms, and the reduction reflects the overall kill of pathogens including viruses. The disinfection efficiency is related to the initial dose, referred to as C, and the time that the wastewater is held in the contact basin, referred to as T. The product of the two, CT, gives a general indication of the resulting disinfection level. The value C can only be increased to a certain level without also increasing T.

As stated recently, the discharge requirement is currently 23 MPN/100 ml of total coliform. This requirement is compared to other potential requirements in Table 3. These

requirements are based on the levels listed in the California Ocean Plan or in proposed revisions to the Plan. The table also gives the needed sodium hypochlorite dose for the value C and the resulting value CT for the existing chlorine contact basin at the rated design flow of 1.5 mgd.

Table 3 Potential Disinfection Requirements Site Master Plan Montecito Sanitary District

Potential Disinfection Requirement	Limit (100 MPN/100 ml)	C (mg/L)	CT (mg/Lxmin)
Shellfish-Existing Plan-Total Coliform	70	10	311
Shellfish-Proposed Plan-Fecal Coliform	14	4	120
Body Contact-Total Coliform	1000	4	120
Body Contact-Fecal Coliform	200	2	47
Existing Permit-Total Coliform	23	15	463

As summarized in the table, the existing permit has the most stringent requirements for the highest dose and greatest CT. The existing limit is also less then the proposed revisions to the Ocean Plan. Note that the existing limit results in a quality that is essentially identical to the California Title 22 limits for full body contact. However, the values for C and CT to meet the existing permit are higher than recommended for reliable disinfection. The chlorine contact basin volume should be increased by 50 percent at the design flow. This will reduce the need dose C and greatly improve disinfection reliability.

3.1.6 Biosolids

The current aerobic digester volume is not sufficient to produce Class B biosolids. The site master plan considers tripling the existing volume. This would provide the required 40 days of digestion at 68°F.

The handling of the biosolids should also consider modifications to reduce the need for the dump truck and double handling.

3.1.7 Wet Weather Storage

Based on experience, the peak wet weather flow through the plant should be limited to about 4 mgd. This flow equates to operating two of the three pumps that will be installed next year. The actual wet weather flow rate coming into the plant could be as high as 6 mgd. Using the third standby pump or a portable bypass pump, wet weather storage is required for the additional 2 mgd. Considering a storm duration of 12 hours, a volume of

approximately 1,000,000 gallons is needed. This volume is more than the existing total aeration basin volume of 772,000 gallons.

The wet weather storage could be converted to aeration basins in the future as part of facility replacement. The existing basins could then be rehabilitated or replaced to provide the wet weather storage.

3.1.8 Recycled Water

Recycled water would be sold to the Montecito Water District for distribution and sale. There are no current plans to produce recycled water at this time. The last market analysis was prepared in 1990 (Water Reclamation Study in Montecito, CA, CH2M Hill). A maximum month demand of 0.5 mgd was identified. The report also considered space and costs for recycling the entire design capacity of 1.5 mgd. Based on the unknowns of future water supply, the site master planning will consider planning for an ultimate capacity meeting the current rating of the plant, 1.5 mgd.

Are various technologies to produce recycled water meeting the California Department of Health Services requirements listed in Title 22. The conventional treatment train would consist of chemical addition, coagulation, flocculation, filtration, and disinfection in a chlorine contact basin. This flow stream would require the most space. The footprint for these processes is approximately 50 by 100 feet. New technologies including membrane filtration and ultraviolet light (UV) disinfection would have a smaller footprint. This is discussed in the next section.

3.1.9 Facility Replacement

The existing concrete treatment structures are approximately 20 to 40 years old. Concrete structures in treatment plants with proper maintenance can last up to 80 to 100 years. At some time, the existing plant will need to be replaced. The site planning should consider addition of a complete new flow train with similar space requirements as existing.

3.2 Building

This section discusses building space needs. The space requirements are based on the staff interviews and reflect staffing, furniture, and equipment needs.

3.2.1 Area Requirements

The present and future space needs are presented in Table 4. The current building space totals approximately 5,400 square feet (sf). This does not include the aerobic digester

blower building. The future needs could be as high as 9,520 sf without on-site staff housing. Much of the additional space would be for Plant Maintenance, Collections Maintenance, and locker rooms. These space requirements have been used to determine overall building size two phases. Phase I will be to construct the Maintenance Building as planned. Phase II will be a new Administration Building in the future.

Table 4 Present and Future Space Requirements
Site Master Plan
Montecito Sanitary District

Building	Present	Projected	Remarks
Administration			
Gen Mgr Office	200	200	
Board Room (w/toilet)	600	800	
Vault	135	135	
Office Staff			
Open Office (No partitioned walls – similar to existing space)	410	580	Added Position
Lobby	85	85	
Copy/Print/Fax/Plotter	Incl	100	
Engineering			
Assist Engineer	150	150	
Inspector	--	100	Added Position
Operations/Maintenance			
O&M Mgr Office	70	150	
Laboratory	400	600	Added Lab Tech & Bact
Operator Area	200	200	
Collections	120	240	
Plant Maintenance	1,260	3,300	Added Equip & Instr Tech
Process Equipment			
Blower Room	600	600	
Generator Room	230	230	
Electrical and Control Room	100	150	
Employee Services			
Toilet/Locker	400	1,000	400 Exist + 600 New
Lunch Room	300	400	
Multipurpose Room	--	900	

Table 4	Present and Future Space Requirements Site Master Plan Montecito Sanitary District		
Building	**Present**	**Projected**	**Remarks**
Building Services			
Mech Equip (Hot water, HVAC)	--	100	
Corridor	75	200	
Janitor	65	100	
SCADA and Network Servers	--	100	
Total	6,300	10,420	

3.2.2 Phase 1 New Operations and Collection Maintenance Building

Phase I would combine the Operations and Collection Maintenance functions in a new building. This building would be only somewhat larger than a building for Operations Maintenance only. The Vac-Con truck would be parked inside the new building. Collections Maintenance would utilize the same locker room. The remaining functions would remain in the existing building. The resulting areas are shown on Table 5.

Table 5	Phase I - New Operations and Collection Maintenance Building Site Master Plan Montecito Sanitary District	
Building	**Existing Building**	**New Building**
Administration		
Gen Mgr Office	200	--
Board Room	600	--
Vault	135	--
Office Staff		
Open Office	580	--
Lobby	85	--
Copy/Print/Fax	100	--
Engineering		
Assist Engineer	150	--
Inspector	100	--
Operations/Maint		
O&M Mgr Office	150	--
Laboratory	600	--

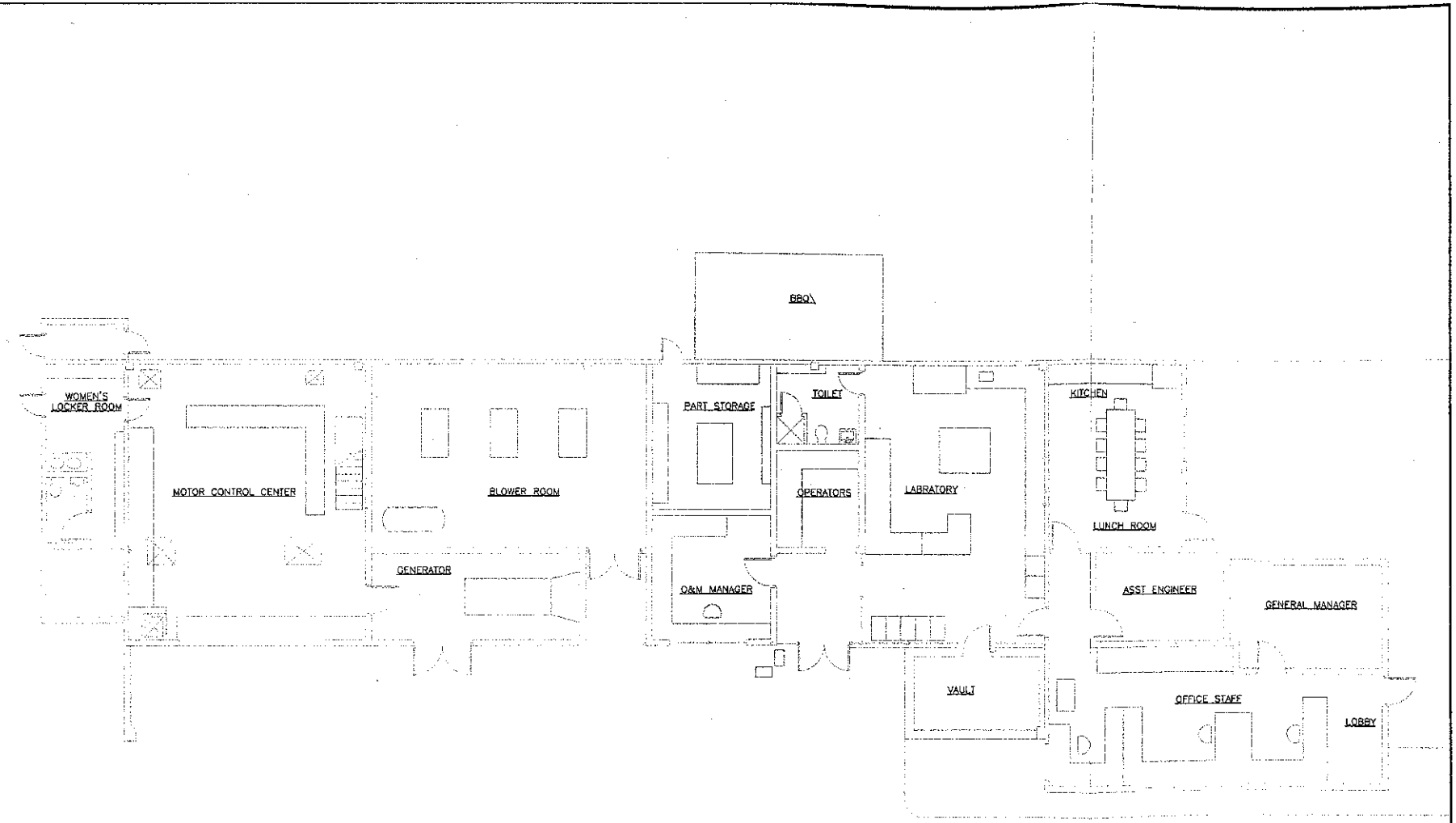
Table 5 Phase I - New Operations and Collection Maintenance Building Site Master Plan Montecito Sanitary District		
Building	**Existing Building**	**New Building**
Operator Area	200	--
Collections	--	240
Plant Maintenance	--	3,600
Process		
Blower Room	600	--
Generator Room	230	--
Electrical and Control Room	150	--
Employee Services		
Toilet/Locker	400	600
Lunch Room	300	--
Building Service		
Mech Equip (Hot Water/HVAC)	--	100
Corridor	75	--
Janitor	65	35
Server	--	--
Total 9,295	4,720	4,575
Note: Existing Building 5,400 s.f.		

A preliminary floor plan of the remodeled existing spaces are shown on Figure 4. This remodeling could occur at any time based on available funding.

3.2.3 Phase II New Administration Building

A new Administration Building would be constructed in Phase II.

The resulting space allocation is reported in Table 6. Once the new Administration Building is constructed, the existing Board Room could be converted into the multipurpose room or operator housing. An additional lunchroom in the new building would alleviate the existing crowding.



DRAWING NO.
FIGURE 4

NO.	DESCRIPTION	DATE	APPROVED
	REVISIONS		

DESIGN DKA
DRAWN CMV
CHECKED
BID NO.
PAGE
ATLAS

PROJECT ENGINEER

PARTNER

carollo engineers

SITE MASTER PLAN

EXISTING OFFICE/SHOP BUILDING WITH PROPOSED MODIFICATIONS

MONTECITO SANITARY DISTRICT
1042 Monte Cristo Lane Santa Barbara, CA 93108

Approved: _____ Date _____, 20 _____
General Manager

Scale:
Vert _____
Hor _____

Sheet ___ of .XX

Table 6	Phase II New Administration Building Site Master Plan Montecito Sanitary District	
Building	**Existing Bldg.**	**New Admin.**
Administration		
Gen Mgr Office	--	200
Board Room (w/toilet)	--	800
Vault	135	--
Office Staff		
Open Office	--	580
Lobby	--	85
Coy/Print/Fax	--	100
Engineering		
Assist Engineer	--	150
Inspector	--	100
Operations/Maintenance		
O&M Mgr Office	--	150
Laboratory	600	--
Operator Area	200	--
Collections	240	--
Plant Maintenance	--	--
Process Equipment		
Blower Room	600	--
Generator Room	230	--
Electrical and Controls	150	--
Employee Services		
Toilet/Locker	400	600
Lunch Room	300	300
Building Services		
Mech Equip (Hot Water/HVAC)	--	100
Corridor	75	125
Janitor	65	35
Server	--	100

Table 6	Phase II New Administration Building Site Master Plan Montecito Sanitary District	
Building	**Existing Bldg.**	**New Admin.**
Total 9,820	2,995	3,425

4.0 ALTERNATIVE SITE LAYOUTS

The previous sections described the existing and current space requirements. This section describes alternative site layouts for review and consideration.

4.1 Constraints

In development of the alternative sites, the following constraints were taken into account.

- Public Buffer--The existing buffer between treatment units and the public and neighbors should be maintained whenever possible.
- Site Topography--Development along the south side of the property will be expensive due to the slope up to Monte Cristo Lane. Development would also encroach onto the buffer area.
- Wastewater Flow Patterns--The layout of the treatment units needs to consider the flow patterns and resulting interconnecting piping.
- Chemical Deliveries--Access off Channel Drive must be maintained. The turn-around space shown on Figure 2 cannot be developed on.

4.2 Alternative Site Layouts

The alternative site layouts have been developed first for treatment needs then building needs. This priority is based on the primary mission of the District, providing wastewater treatment, disposal, and biosolids handling.

4.3 Treatment Layouts

The treatment layouts have been developed with respect to the process order within the overall flow stream.

4.3.1 Preliminary Treatment

Preliminary treatment includes rag removal and grit removal. Ideally, these processes would precede influent pumping. The rag and grit removal would reduce the potential for pump clogging and wear from the grit. Based on the existing site, there is not sufficient space for both processes prior to influent pumping.

Potential preliminary process sites are shown on Figure 5. Figure 5 shows two alternative sites for the screening process, including screenings washing/compaction. There is physical space to construct the screenings process upstream of the influent pumps. However, this space is very restricted. Construction would require very expensive shoring systems. Truck access to remove the compacted rags or for future maintenance is severely restricted. For these reasons, this location is not recommended. The existing rag grinders can remain in place in the Influent Pump Station. Additional screening is recommended downstream.

The second site is just south of the existing Aeration Basins. There is space to construct not only the screenings process, but also the grit chamber, grit washer, and odor control facilities. With the construction of odor control facilities, there would be sufficient buffer distance between the facilities and the neighbors to the south. The facilities could also be screened from the public parking area by landscaping. Access for rag and grit disposal would be from the west as shown.

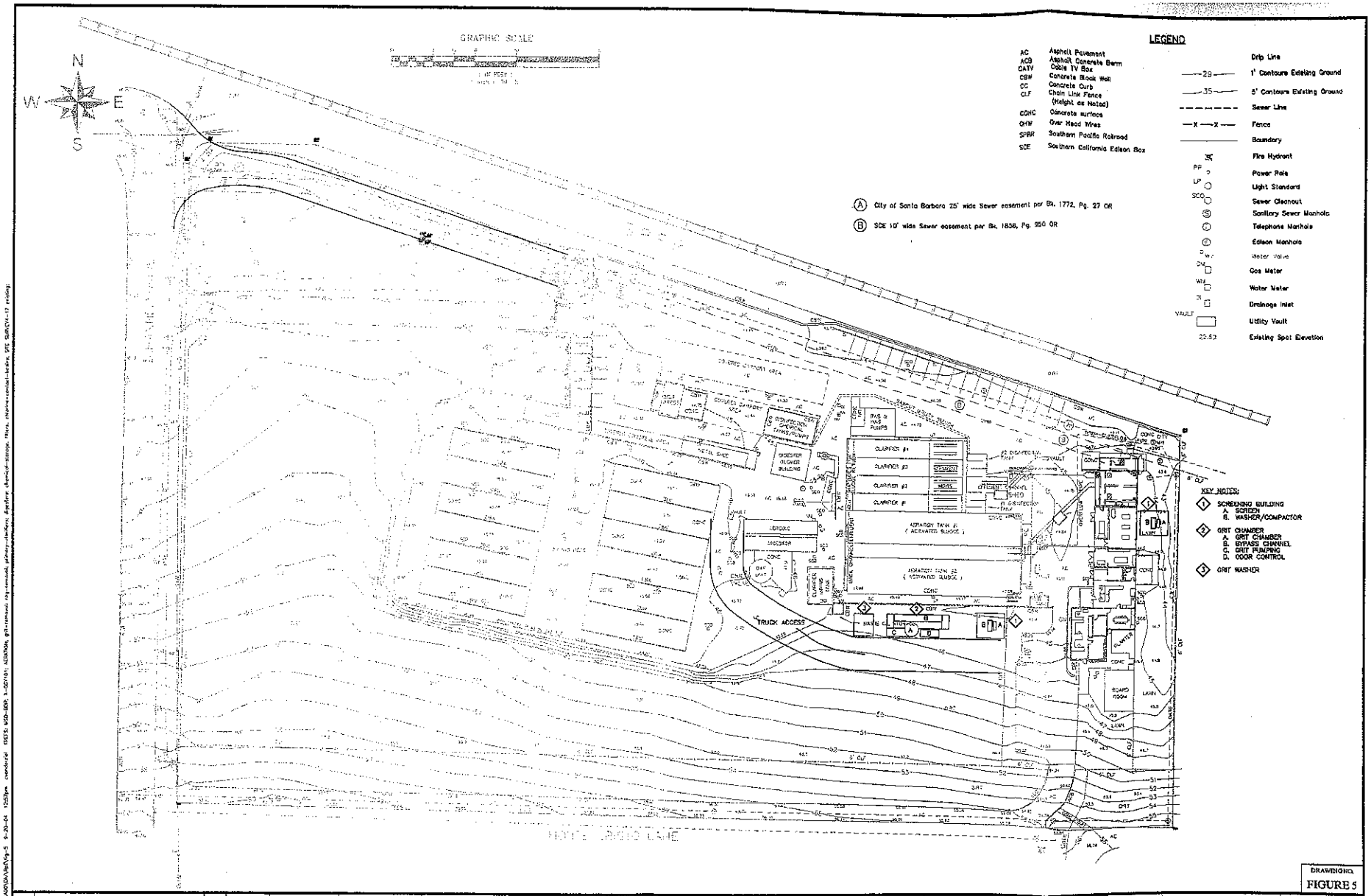
The second location is the apparent best choice. The location fits within the normal flow pattern. It doesn't interfere with the limited space between the treatment processes and the existing buildings.

4.3.2 Primary Treatment/Anaerobic Digestion

The primary clarifiers would be located just downstream of the grit chamber and upstream of the existing aeration basins. A potential location is shown on Figure 6. This location was selected based on the normal flow patterns. It fits with both the preliminary treatment processes and the existing Aeration Basins. This location also allows for future facility replacement as discussed in a subsequent section.

The anaerobic digesters should be located close to the primary clarifiers. This reduces the piping distance between the two processes for sludge and scum piping.

Drawbacks to this site include reduced buffer to the neighbors and costlier construction on the slope. There is a higher odor potential with the addition of primary clarifiers. Even with the odor control facilities shown, odor complaints are a concern.



DRAWING NO.
FIGURE 5

NO.	DESCRIPTION	DATE	APPROVED
	REVISIONS		

DESIGN XXX
DRAWN CMV
CHECKED XXX
EID NO.
PAGE
ATLAS
PROJECT ENGINEER

DATE

carollo engineers

SITE MASTER PLAN

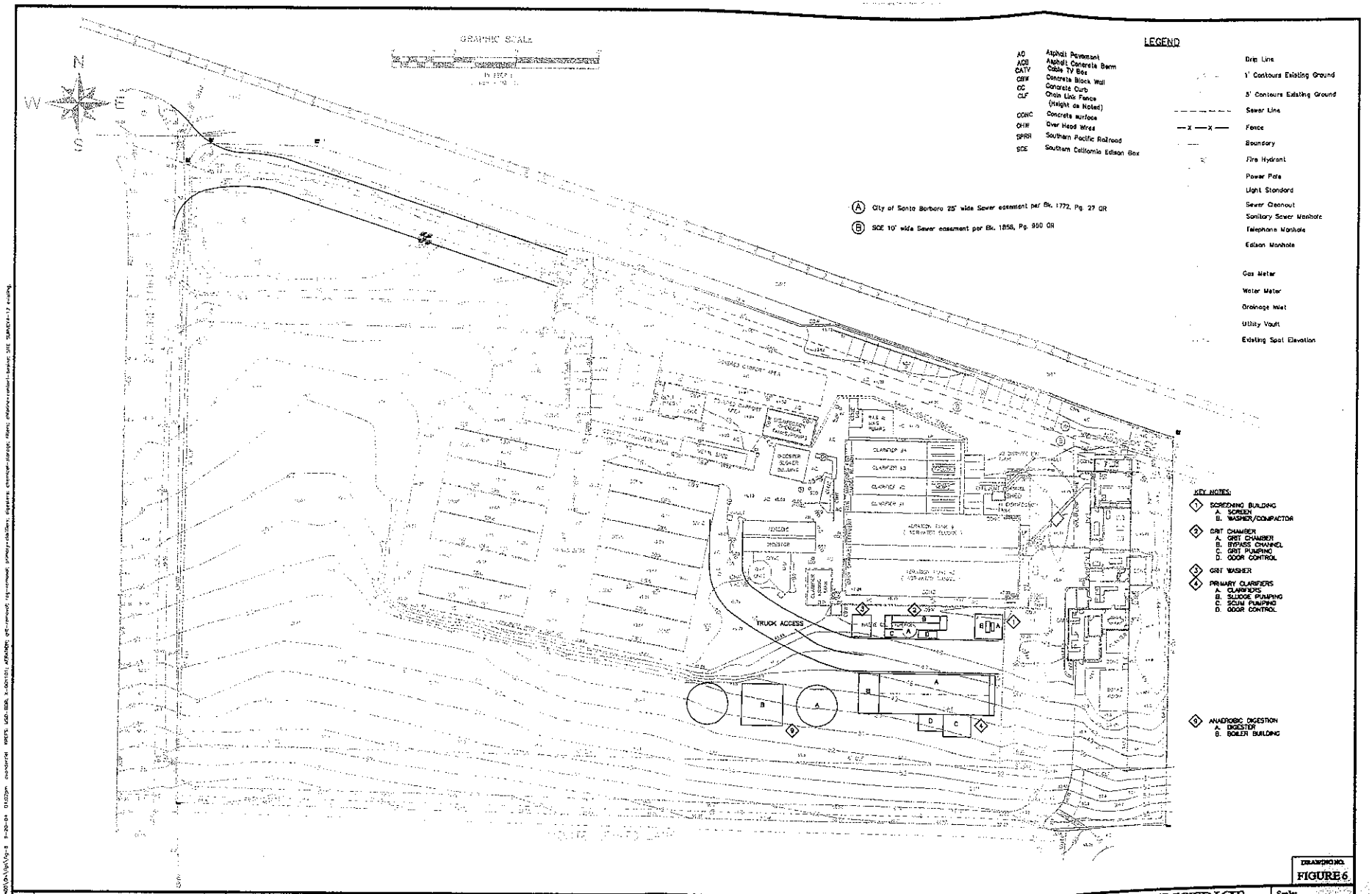
ALTERNATE PRELIMINARY TREATMENT LAYOUTS

MONTECITO SANITARY DISTRICT
1042 Monte Cristo Lane Santa Barbara, CA 93108

Approved: _____ Date _____, 20 _____
General Manager

Scale:
Vert _____
Hor _____

Sheet ___ of XX



DRAWING NO.
FIGURE 6

NO.	DESCRIPTION	DATE	APPROVED
REVISIONS			

DESIGN XXX
DRAWN CMV
CHECKED XXX
BID NO.
PAGE
ATLAS
PROJECT ENGINEER

PARTNER

carollo engineers

SITE MASTER PLAN

PRIMARY CLARIFIER/
ANAEROBIC DIGESTER PLAN

MONTECITO SANITARY DISTRICT
1042 Monte Cristo Lane Santa Barbara, CA 93108

Approved: _____ Date _____, 20 ____
General Manager

Scale:
Vert
Hor

Sheet ___ of XX

As discussed in Section 3.1.3, primary clarifiers only provide for removal of grease, oil, and floatables. The additional treatment capacity afforded is not required for future District growth. The construction cost for the primary clarifiers and anaerobic digesters is estimated to range from $1,500,000 to $2,000,000. Based on cost, limited site, potential impacts, and minimal process benefit, these facilities are not recommended. They are not shown on subsequent site plans.

4.3.3 Grease and Oil Removal

As construction of primary clarifiers is not recommended, the secondary scum improvements discussed in Section 3.1.4 should be considered. These improvements do not have a space requirement.

4.3.4 Disinfection

As reported previously, the chlorine contact basin volume should be increased by 50 percent. This is needed to reliably meet total coliform limits at peak flows.

In review of the existing chlorine contact basin as well as the site, expansion of the existing basin would be very difficult. This is due to the original structural design of the basin. Further, there is not space to construct new volume considering existing site constraints and connection to the ocean outfall. For this reason, it is recommended that the site planning consider construction of ultraviolet radiation (UV) disinfection within the existing chlorine contact basin. This retrofit is a common method to convert chlorine contact basins to the UV technology. The UV technology will increase power costs. The benefits include reduced costs for sodium hypochlorite and sodium bisulfite. These chemicals also increase the salinity of the treated effluent. The salinity reduces the waters value for recycled water irrigation.

4.3.5 Biosolids

Biosolids space needs include additional aerobic digestion capacity, biosolids storage space, and DAFT cleaning.

The existing aerobic digestion capacity is only one-third that required for Class B biosolids production. Class B biosolids are not currently required, as the biosolids are now composted off-site to Class A standards.

The recommended site for the aerobic digester is shown on Figure 7. It is south of the existing DAFT thickener. The site is in the needed proximity of the not only the thickener but the belt filter press and digester blower building.

A portion of the existing sludge drying beds can be retained for DAFT thickener cleaning as shown.

4.3.6 Facility Replacement

The expected footprint for process replacement is also shown on Figure 7. The space requirements will be very similar to the existing process. The major difference shown is that UV disinfection is used in lieu of conventional chlorine contact. This will result in a more compact site and eliminate the future need for chemicals.

For the area shown, only the existing sludge drying bed site is large enough for this need. The sludge drying bed site is also graded to facilitate this construction. The site is still far enough from the property lines to provide the needed buffer to neighbors and the public.

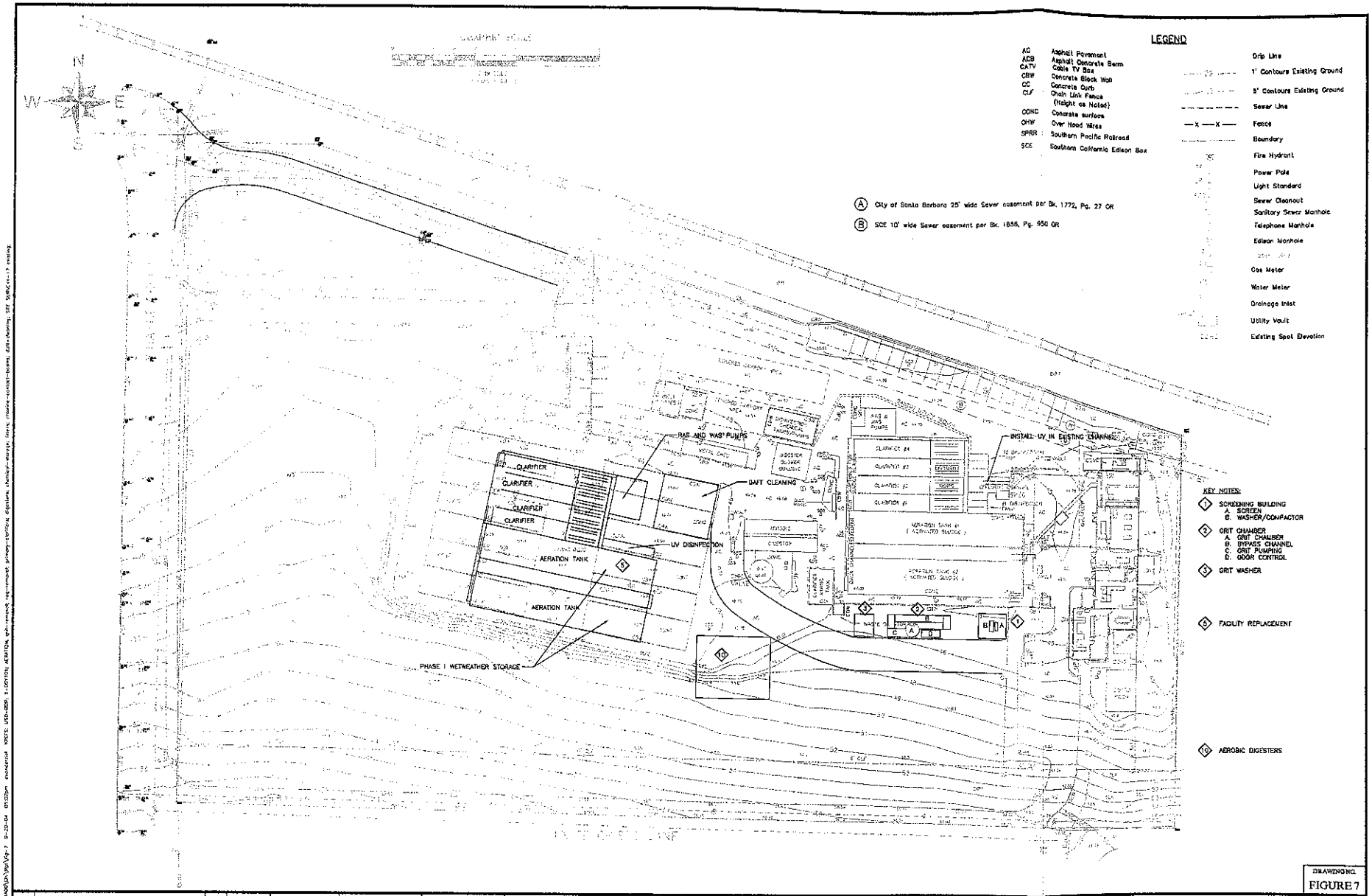
4.3.7 Wet Weather Storage

The wet weather storage needs are projected to be 1,000,000 gallons. This is somewhat greater than the needed aeration basin process volume of 772,000 gallons. As facility replacement must also be planned for, the wet weather storage could be designed and constructed as the future aeration basins. Once the future aeration basins are placed into operation, the existing process basins could then be rehabilitated to provide future wet weather storage. This is shown on Figure 7. This approach has significant cost and space benefits.

4.3.8 Recycled Water

Two options have been evaluated for providing recycled water. One utilizes traditional chlorine contact basins for disinfection. A potential site plan is shown on Figure 8. The recycled water facilities include chemical addition, filtration, disinfection, and pumping.

The alternative process would utilize UV disinfection. This site plan is shown in Figure 9. It significantly reduces the space required for recycled water. This option is recommended for site master planning.



DRAWING NO.
FIGURE 7

NO.	DESCRIPTION	DATE	APPROVED
REVISIONS			

DESIGN XXX
DRAWN CMV
CHECKED XXX
BID NO.
PAGE
ATLAS
PROJECT ENGINEER

PARTNER

carollo engineers

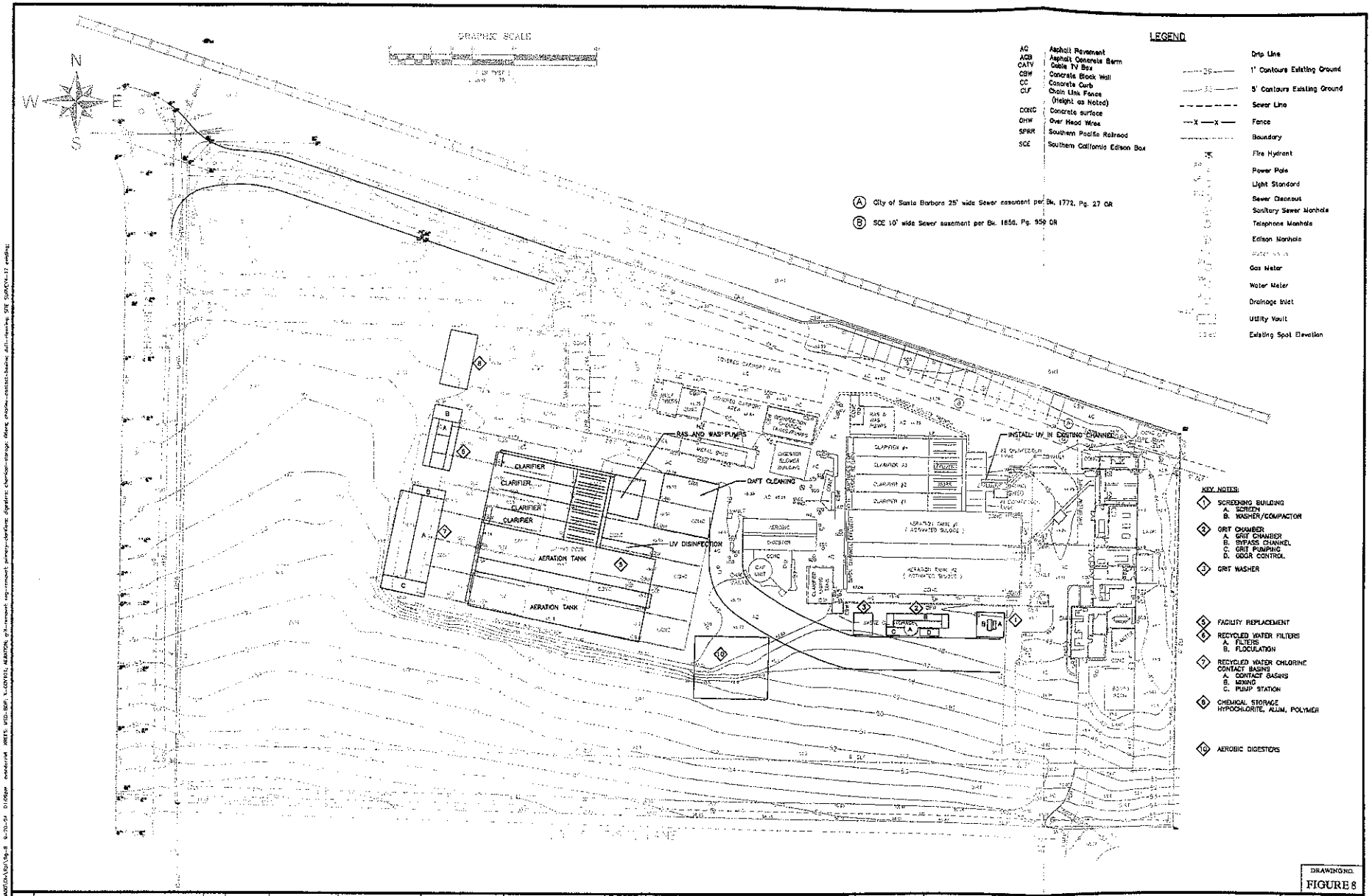
SITE MASTER PLAN

BASE TREATMENT
PROCESS SITE PLAN

MONTECITO SANITARY DISTRICT
1042 Monte Cristo Lane Santa Barbara, CA 93108

Approved: _____ Date _____, 20 _____
General Manager

Scale:
Vert _____
Hor _____
Sheet ___ of XX



DRAWING NO.
FIGURE 8

NO.	DESCRIPTION	DATE	APPROVED
REVISIONS			

DESIGN XXX
DRAWN CMV
CHECKED XXX
BID NO.
PAGE
ATLAS
PROJECT DOCKET

carollo engineers

SITE MASTER PLAN

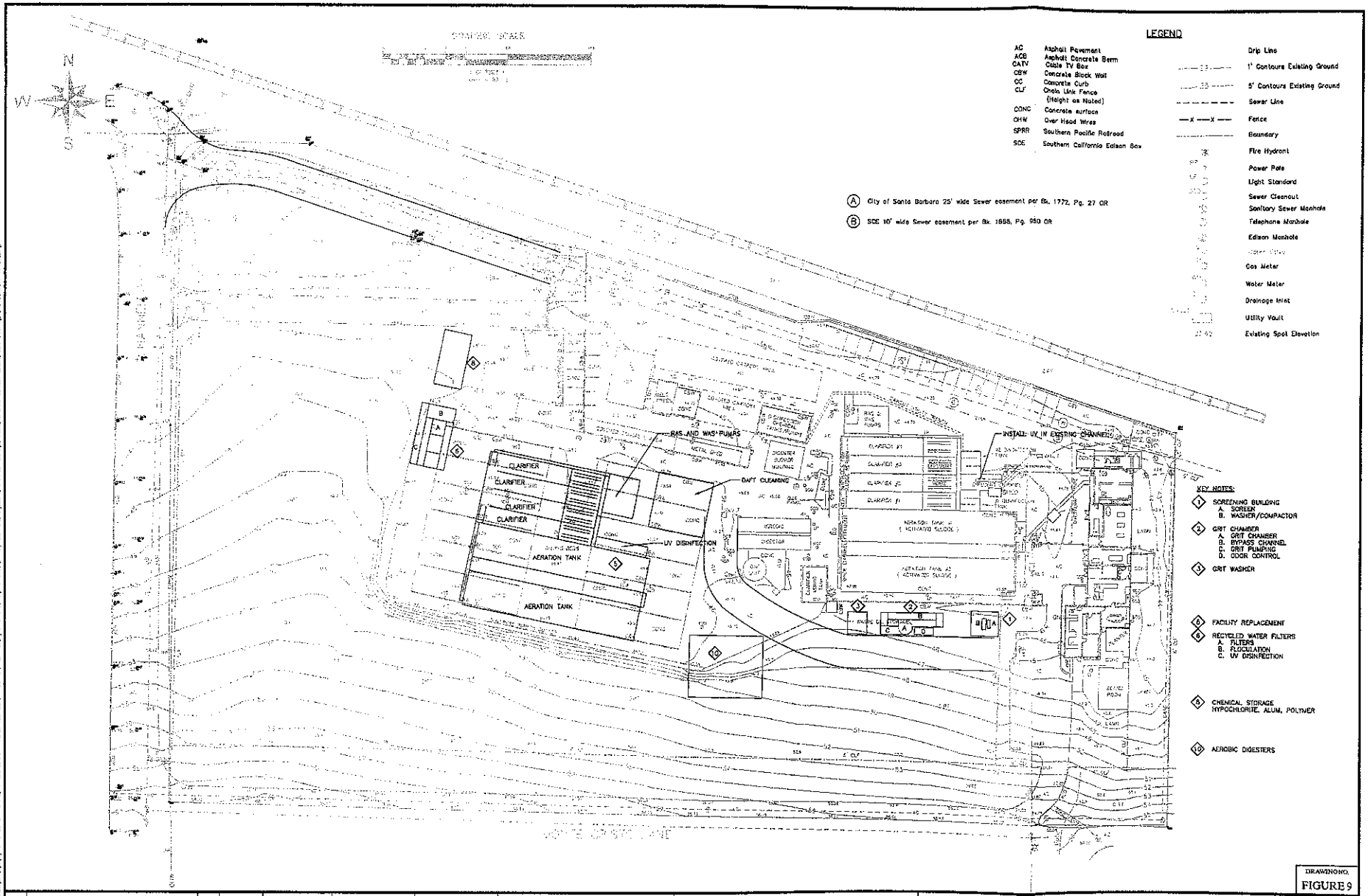
RECYCLED WATER
CONVENTIONAL PROCESSES

MONTECITO SANITARY DISTRICT
1042 Monte Cristo Lane Santa Barbara, CA 93108

Approved: _____ Date _____, 20 ____
General Manager

Scale:
Vert _____
Hor _____

Sheet ___ of XX



DRAWING NO.
FIGURE 9

NO.	DESCRIPTION	DATE	APPROVED
REVISIONS			

DESIGN XXX
DRAWN CMV
CHECKED XXX
BID NO.
PAGE
ATLAS
PROJECT ENGINEER

THOMAS

carollo engineers

SITE MASTER PLAN

RECYCLED WATER
UV DISINFECTION

MONTECITO SANITARY DISTRICT
1042 Monte Cristo Lane Santa Barbara, CA 93108

Approved: _____ Date _____, 20 ____
General Manager

Scale:
Vert _____
Hor _____

Sheet ____ of XX

4.4 Building Layouts

As discussed, two phases have been considered for the future buildings. Phase I is the new Maintenance Shops. Phase II would be the new Administration Building.

4.4.1 Phase 1 Combined Operations and Collection Maintenance

A conceptual site plan for the Operations and Collections Maintenance functions and the future Administration Building is shown on Figure 10. The plan includes the following elements:

- The plan integrates well with chemical deliveries to the potential recycled water facility and for biosolids trucks.
- The building can still be screened somewhat from Channel Drive through additional landscaping. We foresee that this building will be somewhat taller to allow inside parking of the Vac-Con truck.

4.4.2 Phase II Administration Building

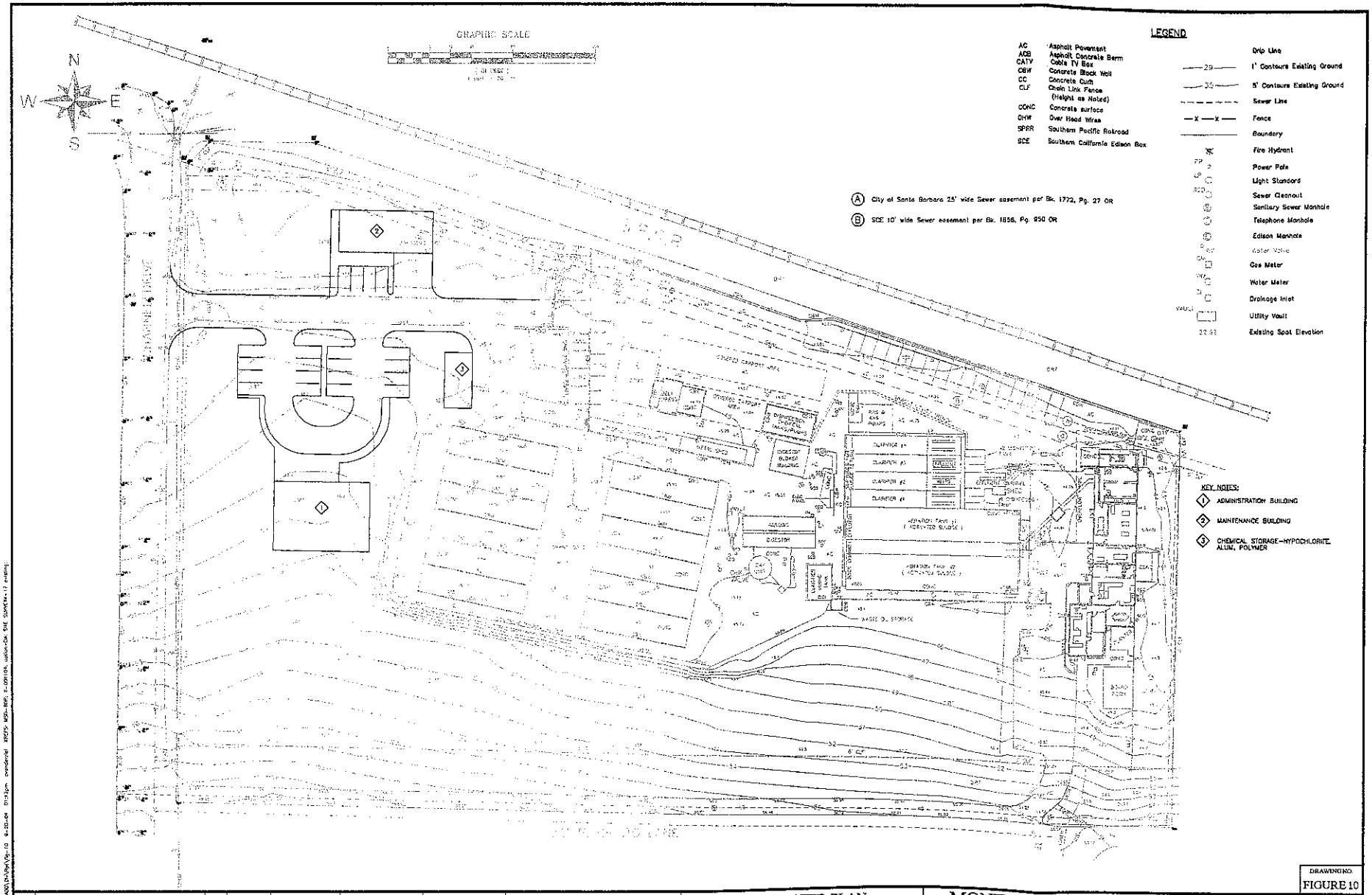
The site plan allows for proper separation of the maintenance functions from the public. Both buildings can easily be constructed on the existing site.

4.4.3 Budget Estimates

Budget estimates for Phase I and II are presented in Table 7. The budget costs will need to be adjusted from today's cost level to account for the final implementation schedule.

Table 7 Building Budget Estimates
Site Master Plan
Montecito Sanitary District

Cost Item	Phase I	Phase II
Building	$750,000	$700,000
Site Work	$200,000	$100,000
Project Costs and Contingencies	$285,000	$240,000
Total	$1,235,000	$1,040,000



DRAWING NO.
FIGURE 10

NO.	DESCRIPTION	DATE	APPROVED
	REVISIONS		

DESIGN CMA
DRAWN CMV
CHECKED DKW
BID NO.
PAGE
ATLAS
PROJECT MANAGER
INSPECTOR

carollo engineers

SITE MASTER PLAN
ALTERNATIVE NO. 3
MAINTENANCE BUILDING
FUTURE ADMINISTRATION BUILDING

MONTECITO SANITARY DISTRICT
1042 Monte Cristo Lane Santa Barbara, CA 93108

Approved: _____ Date _____, 20 ____
General Manager

Scale:
Vert _____
Hor _____

Sheet ___ of XX

5.0 SUMMARY AND RECOMMENDATIONS

5.1 Summary

The existing 6.5 acre site has sufficient area for the anticipated treatment and building needs. This includes future planning for full facility replacement and full treatment to Title 22 levels. The present capacity of 1.5 mgd is sufficient for potential growth or connection of septic systems to the collection system.

The available area will also support the potential improvements while maintaining buffer distances to existing neighbors. The existing landscaping can be preserved for screening.

The plant meets and in most cases exceeds regulatory requirements. The level of operator skill is high. The facilities are well maintained. Limitations of the existing plant include:

1. Lack of rag and grit removal. This increases operator time significantly as compared to plants with proper rag and grit removal.
2. Lack of wet weather storage. The plant is vulnerable during peak storm events. On-site wet weather storage basins would reduce chance of spills.
3. Inefficient grease and oil removal.
4. Limited chlorine contact basin volume during high storm flow events.
5. Insufficient aerobic digester volume to produce Class B biosolids.

Two future buildings have been planned for. Phase I would consist of a 4,600 sf Operations and Collections Maintenance Building. This phase should proceed immediately as planned. The new building is required to allow construction of replacement electrical equipment in the shop. This is a critical need due to the age of equipment and safety. The second phase would be a new Administration Building. There is no scheduled need for this second phase. Remodeling of the existing building would also occur.

5.2 Recommendations

- Proceed with the Phase I Building Program.
- Implement the site master plan for all future potential programs.
- Implement improved disinfection and grease and oil removal as funds allow. These improvements are needed to improve reliability in meeting discharge requirements. These are the highest treatment priorities.

- Develop a contingency plan to increase the aerobic digestion capacity. This project would be triggered by closure of the composting project. While this is not expected, a plan should be in place. This is the second treatment priority.
- Implement improved rag and grit removal as funding is available. This is the third treatment priority.
- Monitor the results of the collection system infiltration/inflow improvement program. If inflow cannot be reduced to limit flows to 4 mgd, construct the wet weather storage.
- Maintain the current road and turn-around areas for chemical and biosolids trucks.
- Replace the existing aeration pipe at the aeration basins.
- Repair the aeration basin concrete.

Appendix A
Montecito Sanitary District Organization Review Forms

MONTECITO SANITARY DISTRICT
ORGANIZATIONAL REVIEW

DEPT NAME . ADMINISTRATION		NO. OF EMPLOYEES: men women 1
DEPT NAME . OFFICE STAFF*		NO. OF EMPLOYEES: men women 2
DEPT NAME . OPERATIONS & MAINT.	MGR 1 COLLECTIONS 4 LABORATORY 1* PLANT OPER 2 PLANT MAINT 2	NO. OF EMPLOYEES: men 10 women
DEPT NAME . ENGINEERING *		NO. OF EMPLOYEES: men 1 women
DEPT NAME .		NO. OF EMPLOYEES: men women
DEPT NAME .	3 ADDITIONAL POSITIONS MAY BE ADDED AT A FUTURE DATE. (1 EA. WHERE NOTED BY *)	NO. OF EMPLOYEES: men women
DEPT NAME .		NO. OF EMPLOYEES: men women
DEPT NAME .		NO. OF EMPLOYEES: men women
DEPT NAME .		NO. OF EMPLOYEES: men women
DEPT NAME .		NO. OF EMPLOYEES: men women
DEPT NAME .		NO. OF EMPLOYEES: men women

TOTALS: men 11 women 3

MONTECITO SANITARY DISTRICT
MASTER PLAN/BUILDNG PROGRAM

○ **DEPT NAME:** . ADMINISTRATION ○ **SPACE NAME:** . GEN. MGR. OFFICE (DIANE) ○ **AREA (SF):** presently . 200 proposed . 200

● FUNCTION:

. DISTRICT MANAGER OFFICE

● OCCUPANTS:

. 1 – PRIVATE OFFICE

● ENVIRONMENT:

floor CARPET
walls GYP BD.
ceiling ACOUSTIC TILE
haz chem . NONE
sprinklers . NONE
other .

● COMMUNICATION:

p.a. system .
telephone . YES
computer . NETWORK COMPUTER

● ELECTRICAL:

lighting . OFFICE TYPE
power . OFFICE TYPE
special .

● PLUMBING:

fixtures NONE

● HVAC:

heating YES A/C
ventilation

● FURNITURE/EQUIPMENT:

description	quantity
. PRESENT OFFICE ADEQUATE	

● SECURITY CONCERNS:

LOCKABLE OFFICE

● ADA COMPLIANT:

yes ✓ no

● FUNCTIONAL RELATIONSHIPS:

related functions: .
needs to be near: . LOBBY, OFFICE STAFF, ENG, O&M MGR
shares . with .
shares . with .

● PROBLEMS/CONCERNS/REMARKS:

MONTECITO SANITARY DISTRICT
MASTER PLAN/BUILDNG PROGRAM

○ **DEPT NAME:** . ENGINEERING ○ **SPACE NAME:** . ASSIST ENG. OFFICE (MIKE) ○ **AREA (SF):** presently . 150 proposed . 250

● FUNCTION:

. ASSIST ENGINEER OFFICE

● OCCUPANTS:

. 1 - PRIVATE OFFICE

● ENVIRONMENT:

floor .CARPET
walls .GYP BD
ceiling . ACOUSTIC TILE
haz chem . NONE
sprinklers . NONE
other .

● COMMUNICATION:

p.a. system .
telephone . YES
computer . NETWORK COMPUTER

● ELECTRICAL:

lighting . OFFICE TYPE
power . OFFICE TYPE
special .

● PLUMBING:

fixtures NONE

● HVAC:

heating YES A/C
ventilation

● FURNITURE/EQUIPMENT:

description	quantity
.	

● SECURITY CONCERNS:

LOCKABLE OFFICE

● ADA COMPLIANT:

yes ✓ no

● FUNCTIONAL RELATIONSHIPS:

related functions: . OTHER ADMIN/OFFICE FUNCTIONS
needs to be near: .
shares . with .
shares . with .

● PROBLEMS/CONCERNS/REMARKS:

MAY ADD POSITION - INSPECTOR (100 SF)

MONTECITO SANITARY DISTRICT
MASTER PLAN/BUILDNG PROGRAM

○ **DEPT NAME:** . OFFICE STAFF

○ **SPACE NAME:** . OPEN OFFICE / COPY (LINDA)(CAROLINE)

○ **AREA (SF):** presently . 410 proposed . 650

● FUNCTION:

. SUPPORT ADMINISTRATION & STAFF
CORRESPONDENCE
PROVIDE INFO TO PUBLIC / AS BUILTS
VISITOR LOBBY

● OCCUPANTS:

. 2 - OPEN OFFICE
POSSIBLE ADDED POSITION (100SF)

● ENVIRONMENT:

floor . CARPET
walls . GYP BD
ceiling . ACOUSTIC TILE
haz chem . NONE
sprinklers . NONE
other .

● COMMUNICATION:

p.a. system .
telephone . 2 TEL, FAX
computer . 2 NETWORK

● ELECTRICAL:

lighting . OFFICE TYPE
power . OFFICE TYPE
special .

● PLUMBING:

fixtures . NONE

● HVAC:

heating YES A/C
ventilation

● FURNITURE/EQUIPMENT:

description	quantity
. WORKSTATIONS	2
FUTURE WORKSTATION	1
FILE CABINETS	EXIST
BOOKCASES	EXIST

WOULD LIKE TO RECLAIM AREA OCCUPIED BY O&M MGR WHEN AVAILABLE.

● SECURITY CONCERNS:

LOCKING CABINETS AS EXIST

● ADA COMPLIANT:

yes ✓ no

● FUNCTIONAL RELATIONSHIPS:

related functions: . LOBBY, VISITOR PARKING
needs to be near: . GEN MGR
shares . with .
shares . with .

● PROBLEMS/CONCERNS/REMARKS:

SEPARATE COPY/PLOTTER/STOR RM HELPFUL
SLIGHTLY MORE SPACE HELPFUL.
FUTURE DOCUMENT INFORMATION SYSTEM WILL FREE-UP SPACE

MONTECITO SANITARY DISTRICT
MASTER PLAN/BUILDNG PROGRAM

○ **DEPT NAME:** . OPERATIONS/MAINT ○ **SPACE NAME:** . MGR OFFICE (JIM) ○ **AREA (SF):** presently . 70 proposed . 150

● FUNCTION:

. DIRECTS OPERATIONS AND MAINT FUNCTIONS - REPORTS TO ADMINISTRATION

● OCCUPANTS:

. 1 - OPEN OFFICE — SHOULD BE A PRIVATE OFFICE - U SHAPE

● ENVIRONMENT:

floor CARPET
walls GYP BD
ceiling ACOUSTIC TILE
haz chem . NONE
sprinklers . NONE
other . NONE

● COMMUNICATION:

p.a. system .
telephone . YES
computer ONE NETWORK, ONE SCADA

● ELECTRICAL:

lighting . OFFICE TYPE
power . OFFICE TYPE
special .

● PLUMBING:

fixtures . NONE

● HVAC:

heating YES A/C
ventilation

● FURNITURE/EQUIPMENT:

description	quantity
. DESK - U SHAPE	1
CHAIR, DESK TYPE	1
BOOKSHELVES	8 LF
SIDE CHAIRS	3
FILE CAB, LATERAL TYPE	8 LF

● SECURITY CONCERNS:

LOCKABLE OFFICE

● ADA COMPLIANT:

yes ✓ no

● FUNCTIONAL RELATIONSHIPS:

related functions: . ALL - ADMIN, OPERATIONS, MAINT, LAB, OFFICE
needs to be near: .
shares . with .
shares . with .

● PROBLEMS/CONCERNS/REMARKS:

NEEDS WINDOW

MONTECITO SANITARY DISTRICT
MASTER PLAN/BUILDNG PROGRAM

○ **DEPT NAME:** . COLLECTIONS ○ **SPACE NAME:** . OPEN OFFICE (CHRIS)(AL, KEVIN, JUAN) ○ **AREA (SF):** presently . 120 proposed . 240

● FUNCTION:

. MAINTAIN COLLECTION SYSTEM
SPENDS 10% OF TIME @ PLANT
USE SPECIAL VEHICLES

● OCCUPANTS:

. 1 MGR, 2 STAFF, 1 FLOAT

● ENVIRONMENT:

floor CARPET
walls GYP BD
ceiling ACOUSTIC TILE
haz chem . NONE
sprinklers . NONE
other .

● COMMUNICATION:

p.a. system .
telephone . ONE IN WORKAREA
computer . ONE COMPUTER/PRINTER

● ELECTRICAL:

lighting . OFFICE TYPE
power . OFFICE TYPE
special .

● PLUMBING:

fixtures . NONE

● HVAC:

heating YES A/C .
ventilation

● FURNITURE/EQUIPMENT:

description	quantity
. MGR WORKSTATION	1
TECH WORKSTATION	2
COMPUTER WORKSSTATION	1
FILE CABINETS	6'
BOOKCASE 4'x4'	1
PLAN RACK	1
PLAN TABLE	1

● SECURITY CONCERNS:

NONE

● ADA COMPLIANT:

yes no ✓

● FUNCTIONAL RELATIONSHIPS:

related functions: . ACCESS TO COPY MACHINE
needs to be near: . VEHICLE PARKING / LOCKER ROOMS
shares . LOCKER RM with . ALL
shares . with .

● PROBLEMS/CONCERNS/REMARKS:

5 VEHICLES NOW - REPLACE ONLY.
HELPFUL TO ENCLOSE COVERED PARKING, ADD
COVER FOR VAC-ON, ADD SPACE FOR TRAILER.
ARROWBOARD PARKING.

MONTECITO SANITARY DISTRICT
MASTER PLAN/BUILDNG PROGRAM

○ **DEPT NAME:** . OPERATIONS / MAINT

○ **SPACE NAME:** . PLANT MAINTENANCE (TIM) (CARL)

○ **AREA (SF):** presently . 1260 proposed . 3300

● FUNCTION:

. MAINT SHOPS, PARTS STORAGE, SMALL OFFICE

● OCCUPANTS:

. 2 – ONE SMALL OFFICE SHARED (150 SF)

● ENVIRONMENT:

floor . CONC

walls . MASONRY

ceiling . OPEN CONSTRUCTION

haz chem . SOLVENT / WELDING

sprinklers . SHOULD HAVE

other .

● COMMUNICATION:

p.a. system .

telephone . YES

computer . COMPUTER W/PRINTER (SHARED)

● ELECTRICAL:

lighting . SHOP TYPE

power . AS REQ'D FOR SHOP EQUIP

special . AS REQ'D FOR WELDING

● PLUMBING:

fixtures . HAND SINK IN SHOP HELPFUL

● HVAC:

heating . YES A/C

ventilation . NEED WELDING HOOD

● FURNITURE/EQUIPMENT:

description	quantity
EXIST - TABLE SAW, BRAKE, DRILL PRESS, GRINDER, PARTS STOR (10 LF), BAND SAW, CHOP SAW, BINS (5 EA), REFRIG, PART WASHER	
NEW - HYDRAULIC PRESS, MIG WELDER, PLAZMA CUTTER, ABRASIVE BLAST CABINET, MAINT CART (ELEC), WELDING VENT HOOD, – 8' WORKBENCH	
9' BOOKSHELVES, 1 FILE CAB., PLAN TABLE	

● SECURITY CONCERNS:

LOCKABLE PARTS STORAGE

● ADA COMPLIANT:

yes no ✓

● FUNCTIONAL RELATIONSHIPS:

related functions: .

needs to be near: . PLANT PROCESS FUNCTIONS

shares . LOCKER RMS with . ALL

shares . with .

● PROBLEMS/CONCERNS/REMARKS:

WELDING 30' AWAY FROM SOLVENT

NEED BRIDGE CRANE.

NEED CONTAINMENT FOR SOLVENT / SOLVENT IN CABINET

MAINT BAY LARGE ENOUGH FOR VAC-ON

MONTECITO SANITARY DISTRICT
MASTER PLAN/BUILDNG PROGRAM

○ **DEPT NAME:** . OPERATIONS/ MAINT

○ **SPACE NAME:** . INDUSTRIAL WASTE MGR LABORATORY (BRETT)

○ **AREA (SF):** presently . 400 proposed . 600

● FUNCTION:

. COMPLIANCE LAB, IND. WASTE TESTING IN FUTURE
FUTURE BACTERIOLOGY LAB.

● OCCUPANTS:

. 1 - OPEN OFFICE IN LAB
POSSIBLE ADDED POSITION (TECH)

● ENVIRONMENT:

floor CHEM RESIST.
walls GYP BD.
ceiling ACOUSTIC TILE
haz chem . MINIMAL & ALLOWABLE
sprinklers . NONE
other .

● COMMUNICATION:

p.a. system .
telephone . YES
computer . YES BRETT, 2nd COMMON NETWORK

● ELECTRICAL:

lighting OFFICE TYPE
power . POWER STRIPS FOR EQUIP.
special .

● PLUMBING:

fixtures ONE LAB SINK MINIMUM

● HVAC:

heating YES A/C
ventilation FUME HOOD

● FURNITURE/EQUIPMENT:

description	quantity
LAB FURN W/ CHEM RESIST COUNTER	
FUME HOOD	1
LAB SINK	1
NEW AUTOCLAVE	1
NEW INCUBATORS	2
NEW ISLAND COUNTER	1
NEW WALL CABINET	1

● SECURITY CONCERNS:

● ADA COMPLIANT:

yes no ✓

● FUNCTIONAL RELATIONSHIPS:

related functions: . OPERATIONS & SCADA COMPUTER
needs to be near: .
shares . with .
shares . with .

● PROBLEMS/CONCERNS/REMARKS:

NEED 10 ADDITIONAL LF OF COUNTER FOR BACTERIOLOGY
NEED SECOND SAMPLE REFRIG IN FUTURE.
NEED NEW CHEM RESISTANT FLOORING.

MONTECITO SANITARY DISTRICT
MASTER PLAN/BUILDNG PROGRAM

○ **DEPT NAME:** . OPERATIONS/MAINT

○ **SPACE NAME:** . OPERATOR AREA (MIKE)(MARK)

○ **AREA (SF):** presently . 200 proposed . 200

● FUNCTION:

. WORKSTATIONS FOR 2 OPERATORS
COMMON OFFICE OK

● OCCUPANTS:

. 2 OPERATORS

● ENVIRONMENT:

floor .
walls .
ceiling .
haz chem .
sprinklers .
other .

● COMMUNICATION:

p.a. system .
telephone .
computer 1 NETWORK & 1 SCADA

● ELECTRICAL:

lighting . OFFICE TYPE
power .
special .

● PLUMBING:

fixtures NONE

● HVAC:

heating YES A/C
ventilation

● FURNITURE/EQUIPMENT:

description | quantity

● SECURITY CONCERNS:

● ADA COMPLIANT:

yes no ✓

● FUNCTIONAL RELATIONSHIPS:

related functions: .
needs to be near: . LABORATORY
shares . with .
shares . with .

● PROBLEMS/CONCERNS/REMARKS:

MONTECITO SANITARY DISTRICT
MASTER PLAN/BUILDNG PROGRAM

○ **DEPT NAME:** . EMPLOYEE SERVICES ○ **SPACE NAME:** . LUNCHROOM ○ **AREA (SF):** presently . 300 proposed . 400

● FUNCTION:

. STAFF KITCHEN / LUNCHROOM

● OCCUPANTS:

. 10-12 @ TABLE, ADDITIONAL 4-6 SEATED.

● ENVIRONMENT:

floor . TILE
walls . GYP BD
ceiling . ACOUSTIC
haz chem . NONE
sprinklers . NONE
other .

● COMMUNICATION:

p.a. system .
telephone . ONE
computer . NONE

● ELECTRICAL:

lighting OFFICE TYPE
power
special .

● PLUMBING:

fixtures KITCHEN SINK

● HVAC:

heating YES A/C
ventilation

● FURNITURE/EQUIPMENT:

description	quantity
. TABLE	1
CHAIRS	10-12
REFRIG.	1
MICROWAVE	2
DISPOSER	1
KITCHEN CABINETS	12-15 LF

● SECURITY CONCERNS:

NONE

● ADA COMPLIANT:

yes ✓ no

● FUNCTIONAL RELATIONSHIPS:

related functions: . CONVENIENT TO ALL
needs to be near: .
shares . with .
shares . with .

● PROBLEMS/CONCERNS/REMARKS:

ISOLATE FROM LABORATORY

MONTECITO SANITARY DISTRICT
MASTER PLAN/BUILDNG PROGRAM

○ **DEPT NAME:** . BUILDING SERVICES ○ **SPACE NAME:** . VISITOR TOILETS ○ **AREA (SF):** presently . 70 proposed . 140

● FUNCTION:

BOARD ROOM/VISITOR/ADA TOILET FACILITIES

● OCCUPANTS:

. 1 MEN
1 WOMEN

● ENVIRONMENT:

floor CERAMIC
walls CERAMIC
ceiling GYP BD.
haz chem . NONE
sprinklers . NONE
other .

● COMMUNICATION:

p.a. system .
telephone NONE
computer . NONE

● ELECTRICAL:

lighting .
power . MINIMUM
special .

● PLUMBING:

fixtures 1 WC, 1 LAV = MEN
1 WC, 1 LAV = WOMEN

● HVAC:

heating YES A/C
ventilation

● FURNITURE/EQUIPMENT:

description	quantity
.	

● SECURITY CONCERNS:

CONTROL VISITOR ACCESS

● ADA COMPLIANT:

yes ✓ no

● FUNCTIONAL RELATIONSHIPS:

related functions: . NEAR VISITOR LOBBY, BOARD RM
needs to be near: .
shares . with .
shares . with .

● PROBLEMS/CONCERNS/REMARKS:

MONTECITO SANITARY DISTRICT
MASTER PLAN/BUILDNG PROGRAM

○ **DEPT NAME:** . EMPLOYEE SERVICES ○ **SPACE NAME:** . LOCKER ROOMS ○ **AREA (SF):** presently . 400 proposed . 1000

● FUNCTION:

. TOILET / LOCKER / SHOWER FOR STAFF

● OCCUPANTS:

. 16 MEN
4 WOMEN

● ENVIRONMENT:

floor CERAMIC
walls GYP BD
ceiling ACOUSTIC TILE
haz chem . NONE
sprinklers . NONE
other .

● COMMUNICATION:

p.a. system .
telephone NONE
computer NONE

● ELECTRICAL:

lighting .
power MINIMUM
special .

● PLUMBING:

fixtures MEN: 1 WC, 1 UR, 2 LAV, 6 SHWR
WOMEN: 1 WC 1 LAV. 1 SHWR

● HVAC:

heating YES A/C
ventilation

● FURNITURE/EQUIPMENT:

description	quantity
. LOCKERS	20
BENCHES	

● SECURITY CONCERNS:

NONE

● ADA COMPLIANT:

yes ✓ no

● FUNCTIONAL RELATIONSHIPS:

related functions: . COLLECTIONS, O&M STAFF
needs to be near: .
shares . with .
shares . with .

● PROBLEMS/CONCERNS/REMARKS:

6 SHOWERS PRESENTLY, OVERCROWDED, MAY NEED MORE