EIR APPENDICES

Appendix G – Engineering Report

Ruggeri-Jensen-Azar & Associates (RJA). October 2008.
Engineering Report for Development of Santana Ranch.

Engineering Report
For Development Of
Santana Ranch

San Benito County, California
October 2008

Prepared for:

Santana Ranch Property Owners
c/o Mr. Jim Weaver
Pacific Rim Planning Group

Prepared by:

RJA
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ENGINEERS ▪ PLANNERS ▪ SURVEYORS

Santana Ranch Property
Engineering Report

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Santana Ranch
Engineering Report

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Introduction

This report is prepared as a technical appendix to the Santana Ranch Specific Plan. This report will provide an overview of:

- The proposed development scenario
- Existing conditions
- Expected grading work
- A preliminary understanding of the sewer, potable water, reclaimed water, and storm drainage infrastructure to support the proposed project.

Purpose of Report

This report was prompted by the desire of the Santana Ranch Property owners to proceed with development of their property including residential, commercial and institutional uses. This study will be used by the preparers of the development application to present the basic infrastructure and utility elements of the plan, as well as aiding the property owners in basic preliminary design decisions.

This conceptual report, with its accompanying calculations and exhibits, is intended to give an initial overview of the conceptual project layout and the construction of basic infrastructure to serve the proposed project and is not intended to be used for final design or construction.

Limitations of Study

This study is limited to brief discussion of the existing conditions and identification of the "backbone" utility infrastructure needed to support the proposed development. The initial calculations are based on land use assumptions provided by the property owners and their consultants. All calculations used to determine sizes of the backbone infrastructure are for preliminary study purposes only.

Final design calculations will be required as part of the design process leading to County and numerous other agencies' approval and permitting for construction of the project's infrastructure.

Study Area

The proposed Santana Ranch project is located in unincorporated San Benito County, along Fairview Road. It abuts the City of Hollister's current city limits (See Figure B-1 "Vicinity Map"). Nearby significant streets include Sunnyslope Road and Hillcrest Road (both east-west collector streets). The property is bounded by:

- Fairview Road to the west
- Undeveloped land to the north, east and south

The site encompasses approximately 292 acres, in a generally rectangular shape with dimensions of about 2,640 feet by 4,900 feet. The Santana Ranch project is comprised of the following parcels:

Table I. Ownership Summary

	APN	Owner	Size (Acres)
1	025-100-001	Anderson	49.32
2	025-370-001	Guerra	30.36
3	025-370-002	Guerra	64.62
4	025-370-007	Anderson	72.9
5	025-370-009	Anderson	78.5
		Total =	**292.0**

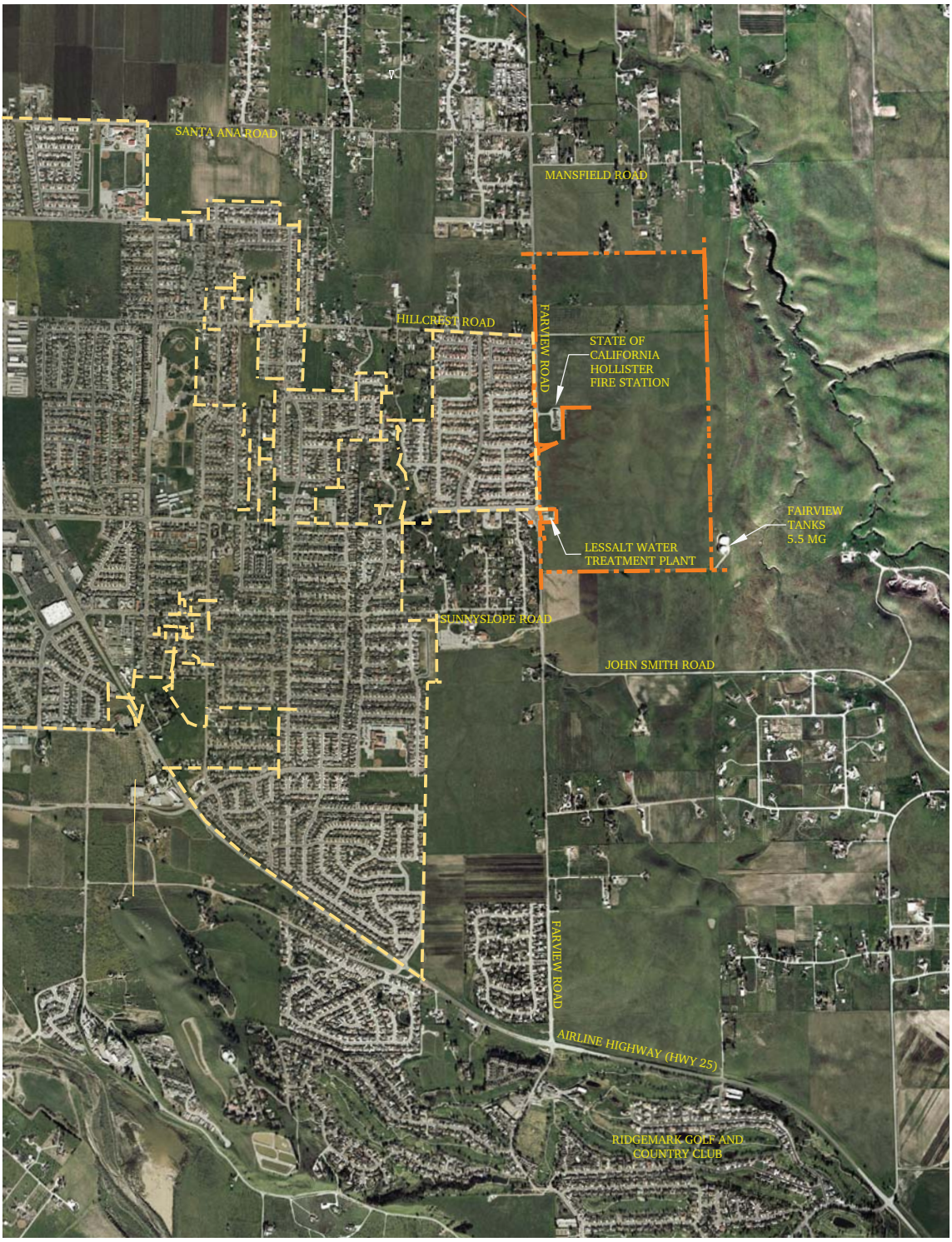
There is a California Department of Forestry (CDF) Fire Station and a Water Treatment Facility (LESSALT) jointly owned by the City of Hollister and Sunnyslope County Water District along the east side of Fairview Road, adjacent to the plan area.

Topography

Figure B-2 shows the existing site topography. The project site can be characterized as gently sloping to hilly with slopes ranging from 15% to less than 5%. The elevations across the property vary from 370 feet (at the northern perimeter) to 490 feet (near the southern boundary).

For this report it is assumed that the project will:

- Achieve as close to a balanced earthwork condition with minor import/export
- Accommodate overland storm water release
- Optimize the quality of the specific plan development
- Accommodate the PG&E gas mains in place and utilize the utility corridor for a linear park



LEGEND

HOLLISTER CITY LIMITS

PROJECT BOUNDARY

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FIGURE B-1
VICINITY MAP
SANTANA RANCH
SAN BENITO COUNTY, CALIFORNIA
OCTOBER 2008
062038

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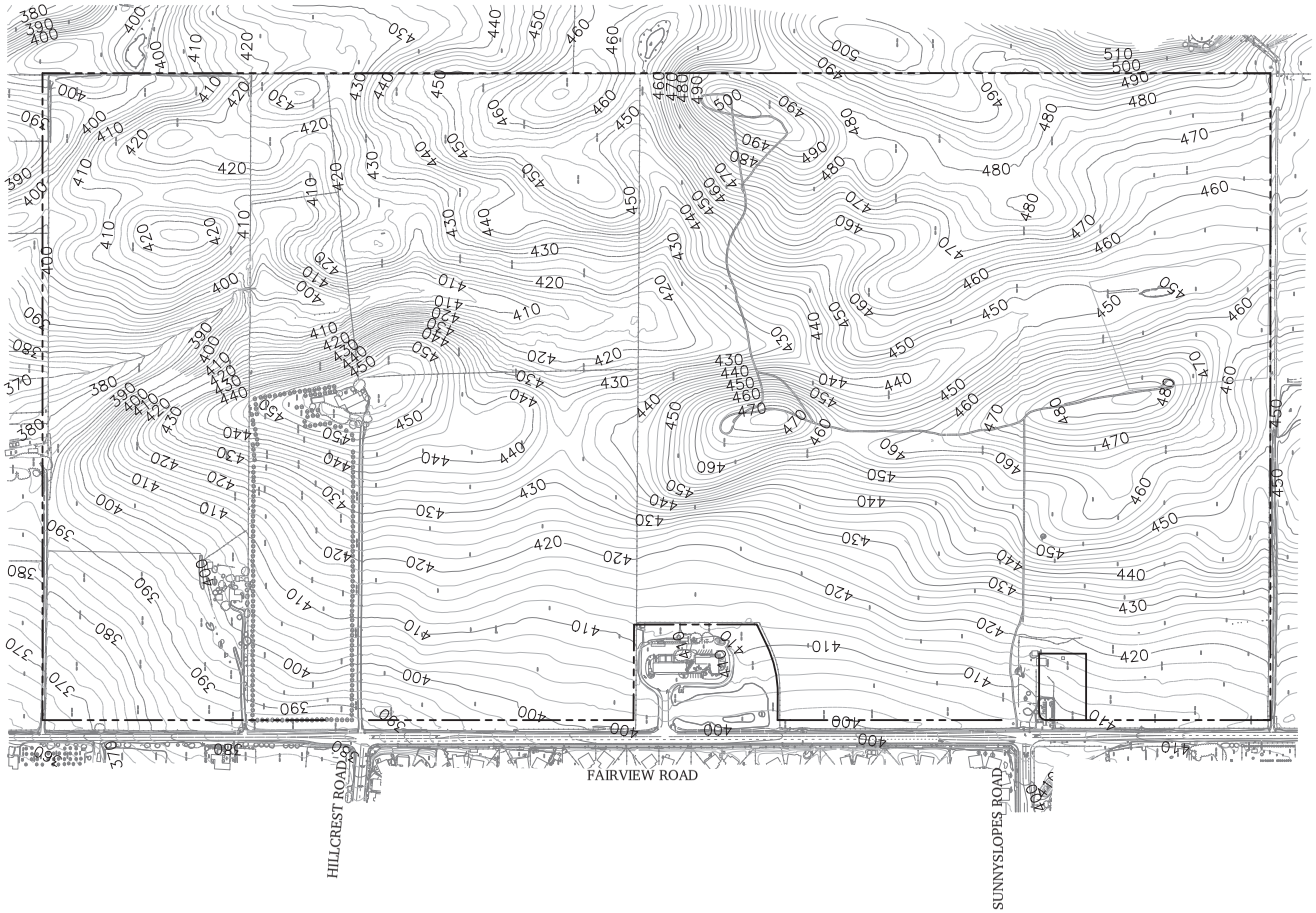

N.T.S.

FIGURE B-2
EXISTING TOPOGRAPHY
SANTANA RANCH
SAN BENITO COUNTY, CALIFORNIA
OCTOBER 2008
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Existing Utilities and Easements

Figure B-3 shows the known existing utilities and easements on the project site. There is a major PG&E gas main crossing the site (within an easement of varying width). According to the property owners there is a smaller PG&E gas main that is no longer in service within an easement that was replaced by the larger PG&E gas main. This older PG&E gas main will be removed and the easement quit-claimed as the project moves through the entitlement stage.

The utilities and easements shown on this exhibit are from information provided by the property owners and listed or referenced in a preliminary title report. There are known discrepancies with the project boundary and the easement(s) associated with the PG&E gas mains. The title report for the northern parcel does not show an easement for this facility. This is further complicated by a slight bend in the gas main alignment across this same parcel based on review of the USGS quad map.

These discrepancies have been discussed with the Santana Ranch Property Owners and also forwarded to the Title Officer for further research. Updated title reports will be obtained as the project moves thru the entitlement process to confirm this information.

Land Use Assumptions

The Santana Ranch parcels are undeveloped with the exception of 2 residences, an orchard and various out buildings associated with agricultural activities. The proposed land uses are:

- Residential (low, medium and high density)
- An elementary school
- Mix use commercial
- Parks and recreation facilities

The following table shows the proposed land uses and approximate areas:

Table II. Proposed Land Uses

Land Use	**Size (acres)**	**Description (Dwelling Units)**
Single Family Residential	197.5	774
Multi-Family Residential	46.4	318
Mixed-Use	5.9	
Parks	18.2	
Neighborhood Commercial	5.8	
Fairview Road R/W	5.5	
Elementary School (800 students)	8.0	
Detention Basins	4.9	
Grand Total =	**292.2**	**1,092**

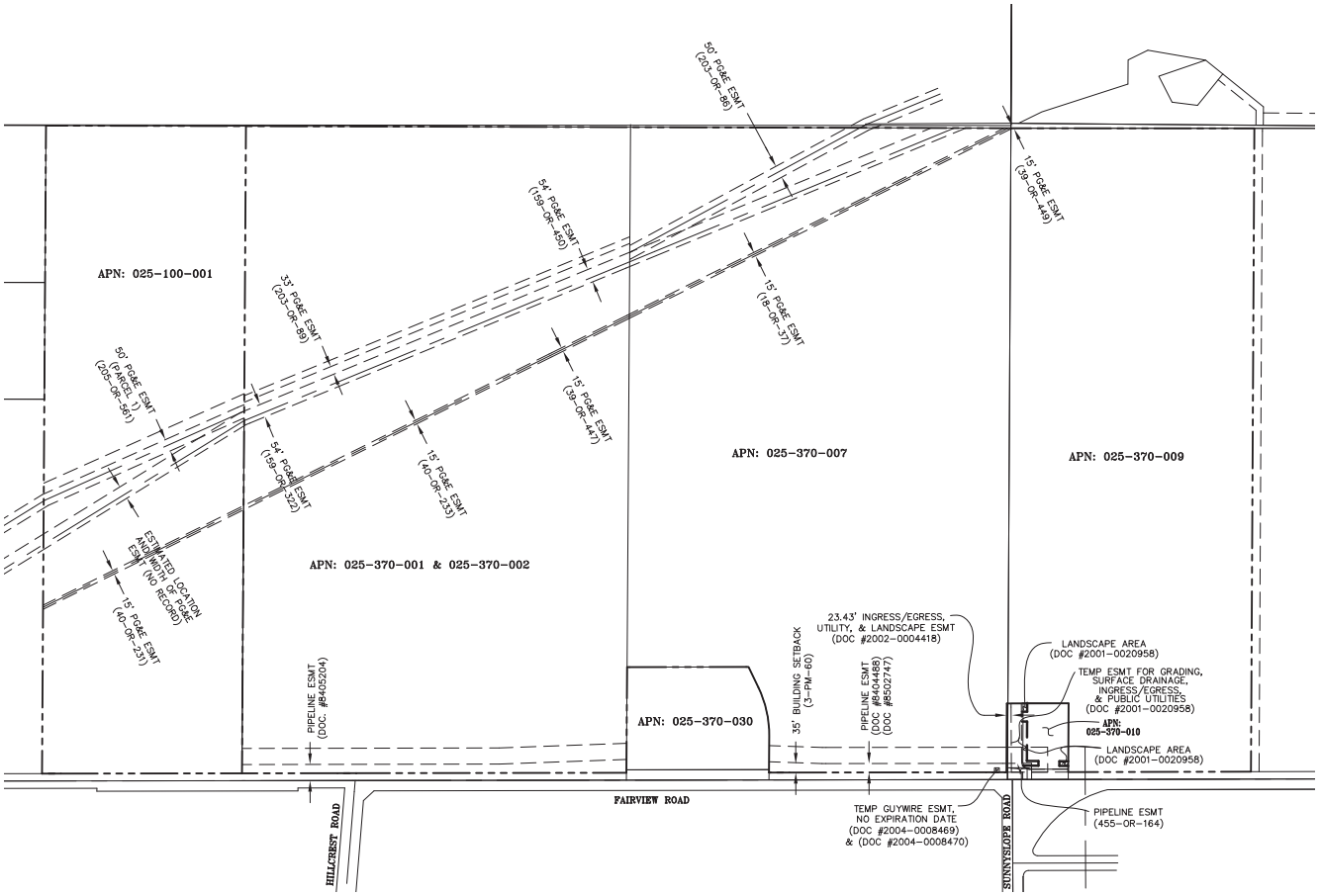

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FIGURE B-3
EXISTING UTILITIES AND EASEMENTS
SANTANA RANCH
SAN BENITO COUNTY, CALIFORNIA
NOVEMBER 2008
062038

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Grading

A conceptual grading plan was developed for the project to:

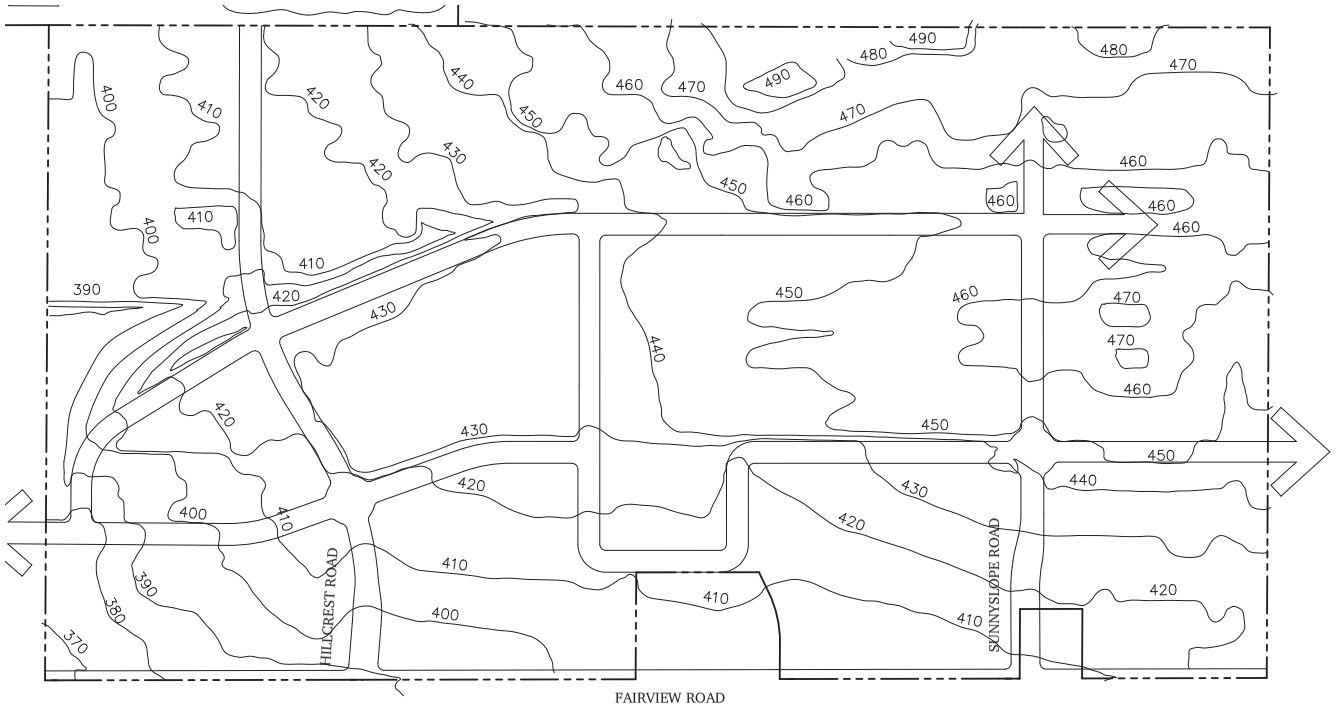
- Achieve as close to a balanced earthwork condition with minor import/export
- Accommodate overland storm water release
- Optimize the quality of the specific plan development
- Accommodate the PG&E gas mains in place and utilize the utility corridor for a linear park

The grading concept shown in Figure C-1 would require cuts and fills generally of less than 5 feet with some areas requiring grading of between 10 to 20 feet. There is expected to be 1.80 to 2.00 million cubic yards of earth moved (cut/fill) within the project site.

The grading conforms along the perimeter of the site are expected to be composed of maximum 2:1 slopes with heights ranging from 0 to 20 feet. Retaining walls may be required and grading conforms are not expected to extend offsite.

The existing PG&E gas mains are a significant constraint to the site grading since it is assumed that the facility will remain in place and only minor grading may occur over the pipeline. During construction the contractor would be required to coordinate with PG&E due to the need for large construction equipment to cross the gas main.

For the private wastewater treatment plant option, the project will require off-site grading for the private wastewater treatment plant and associated holding/percolation ponds (with 63 acre-feet of storage), force sewer main, and access road. The amount of grading for this work is expected to be approximately 75,000 to 100,000 cubic yards of cut and fill.



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EARTHWORK SUMMARY

ITEM	ESTIMATED QUANTITY RANGE
SITE CUT	1,912,000 CY ±
SITE FILL	916,000 CY ±
EXPORT	996,000 CY ±

FIGURE C-1
PROPOSED GRADING CONCEPT
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SAN BENITO COUNTY, CALIFORNIA
OCTOBER 2008
062038

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Sanitary Sewer

Sewage Generation & Collection

Based on the preliminary land use assumptions the project is expected to produce an Average Daily Dry Weather Flow of approximately 0.38 MGD with corresponding peak day flow of 0.66 MGD(assumed peaking factor of 1.75).

Table III summarizes the expected sewer generation for each proposed land use for the project.

Table III. Estimated Sewer Generation

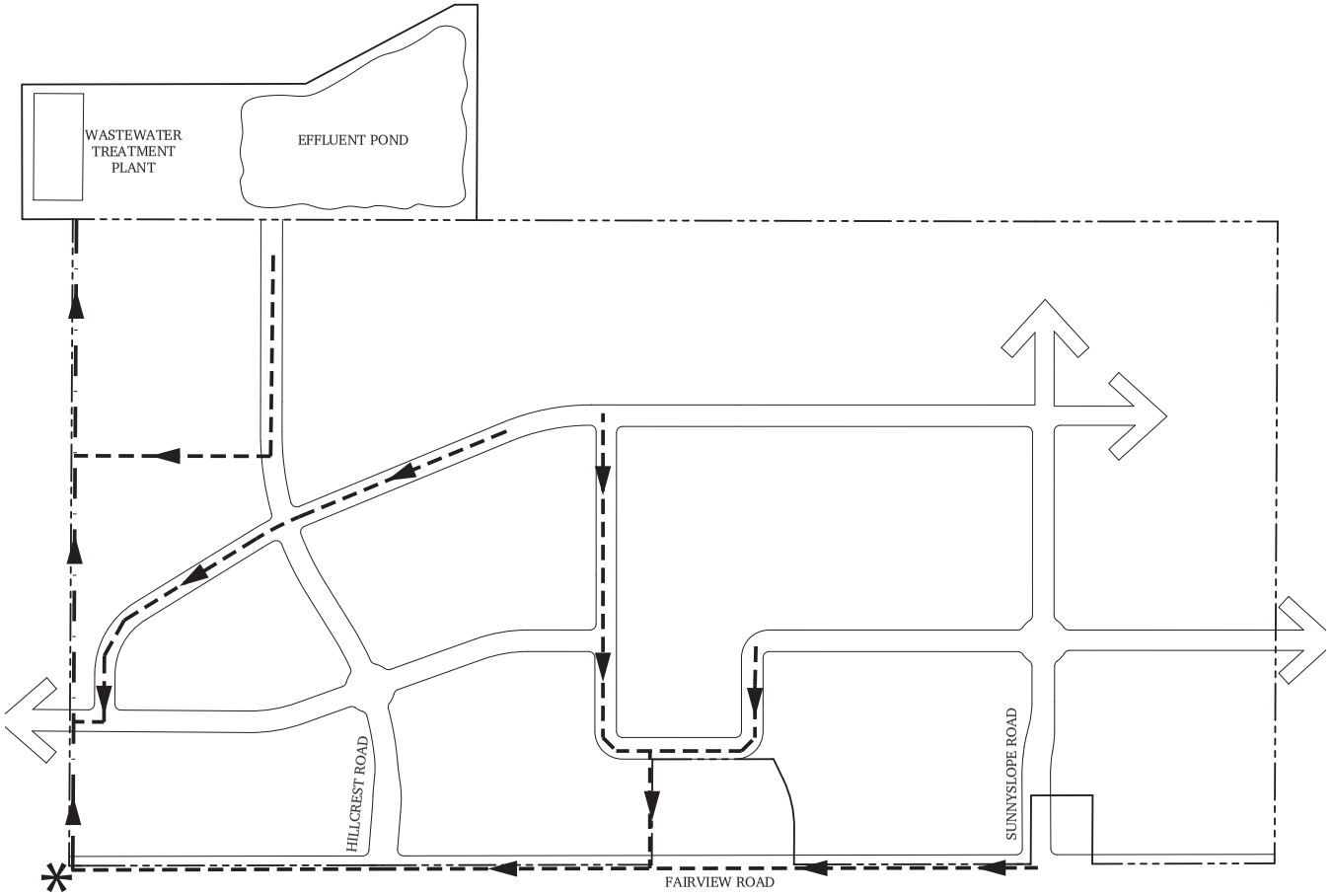
Proposed Use	Size (acres)	Description	Sewer Generation Factor (gallons/day)	Average Dry Weather Daily Sewage Flow Ranges (gallons/day)
Single Family Residential	197.5	774 DUs	245 to 315	189,600 to 244,000
Multi-Family Residential	46.4	318 DUs	245 to 315	77,900 to 100,200
Mixed Use	5.9		2,500 - 3,000	14,750 - 17,700
Parks	18.2		0	0
Neighborhood Commercial	5.8		2,500 – 3,000	15,000 to 18,000
Fairview Road R/W	5.5		0	0
Elementary School	8.0	800 students	20 - 25	16,000 to 20,000
Detention Basins	4.9		0	0
Grand Total =	**292.2**			**298,540 to 381,980**

Sewer Generation factors are from the February 2005 Marina Coast Water District Wastewater Collection System Master Plan. 3.5 persons per dwelling unit was assumed for both Single family and multi-family dwelling units.

Development of the site will require construction of gravity collection mains, a sewer pump station, and force main to convey the project-generated wastewater to the proposed private sewage treatment plant to be constructed to serve the project. Exhibit D-1 shows a conceptual "backbone" sewer collection system based on the current street configuration for the project.

Sewage Treatment

Information regarding the private sewage treatment plant from PERC Consultants is contained in Appendix B.
It is important to note that in October 2004 the City of Hollister, County of San Benito, and San Benito County Water District entered into a "Memorandum of Understanding" to develop a Water and Wastewater Master Plan for the Hollister Urban Area. They hired HDR Consultants to prepare this master plan and the final draft document was expected to be presented at an April 2007 Public Workshop.



LEGEND

- SANITARY SEWER (GRAVITY FLOW)
- SANITARY SEWER FORCE MAIN
- PROJECT BOUNDARY
- SEWAGE PUMP STATION

N.T.S.

FIGURE D-1
OPTION 1
PROPOSED "BACKBONE"
SANITARY SEWER SYSTEM
SANTANA RANCH
SAN BENITO COUNTY, CALIFORNIA
OCTOBER 2008
062038

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Domestic Water Supply

The potable water supply for interior and exterior uses within Santana Ranch is expected to be a combination of:

- Sunnyslope County Water District supply from existing and new groundwater wells.
- Agreement with City of Hollister (dated October 12, 1972) to supply 300 homes and appurtenant uses on APNs 25-37-0-004 and 25-19-0-001.
- Central Valley Project "Municipal and Industrial water" (M&I) surface water.

See Section VII "Recycled Water" regarding the irrigation of on-site parks, roadway landscaping and other non-essential exterior uses (i.e., open spaces) using treated effluent from the on-site wastewater treatment plant.

The following water use factors were used in calculating the project potable and non-potable water demand:

Land Use	Water Use Factors (acre-foot per year)	Water Use Factors (gallons per day)
Single Family Dwelling	0.33 per dwelling unit	300 per dwelling unit
Multi-Family (Apartments)	0.25 per dwelling unit	225 per dwelling unit
Commercial	.0003 Per square foot of building	0.268 Per square foot of building
Active Park	2.5 per acre	2230 per acre
School	- - -	30 gallons per student

Water use factors are from the 2005 Marina Coast Water District Urban Water Management Plan. The water demand for the 6.0 acre Commercial Parcel assumes 25 percent building floor area-to-gross area (FAR) coverage. Therefore the water demand calculation is:

(6.0 acres x 43,560 sq ft/acre x 0.25 FAR x0.0003 ac-ft/year x 325,900 gallons/ac-ft) /365 days/year **= 17,500 gallons per day**

The estimated water demand for the project is presented in the Table IV. The expected Average Day Demand for the project is 325,500 Gallons/Day with an expected Maximum Day Demand of 651,000 Gallons/Day (assuming Max Day Demand is 2.0 times Average Day Demand).

Table IV. Estimated Potable Water Demand				
Land Use	**Size (acres)**	**Description**	**Water Demand Factor (gallons/day)**	**Average Day Demand (gallons/day)**
Single Family Residential	197.5	774 DUs	300	232,300
Multi-Family Residential (indoor)	46.4	318 DUs	225	71,550
Mixed-Use	5.9	65,000 SF	0.269	17,500
Parks	18.2		2,232	40,622
Neighborhood Commercial	5.8	65,000 SF	0.269	17,500
Fairview Road R/W	5.5		1,875	10,300
Elementary School (indoor)	8.0	800 students	30	24,000
Detention Basins	4.9		0	0
Grand Total =	**292.2**			
			Total Demand =	**414,000 gallons per day** or **1.27 acre-feet per day**
			(1 acre-foot of water equals 325,900 gallons)	

Therefore the estimated water demand for the Santana Ranch Project is approximately **414,000 gallons/day or 463 acre-feet per year**.

Conceptual Supply and Treatment

Sunnyslope County Water District (SSCWD) is the expected water purveyor for the Santana Ranch Project since the project lies entirely with the SSCWD "Sphere of Influence". A "Service Area Adjustment" must be approved by LAFCO since a portion of the project is not within the current "SSCWD Service Area".

SSCWD provides domestic water services to approximately 5,200 accounts in the neighborhoods to the south and east of the project. SSCWD's water supply is generated from four wells, which produce approximately 3,450 Gallons/Minute plus half the production of the LESSALT Water Treatment Plant (jointly owned with the City of Hollister) which produces approximately 1,000 Gallons/Minute. The LESSALT Plant treats surface water from the Central Valley Project-San Felipe Division for distribution to the Sunnyslope County Water District and the City of Hollister. This project would require that LESSALT WTP production capacity be increased to treat additional CVP water. San Benito County Water District is the United States Bureau of Reclamation (USBR) contract agency for San Felipe water.

Other major SSCWD facilities include two storage tanks, two booster tanks and approximately 29 miles of pipelines. The existing SSCWD supply, storage and distribution systems must be supplemented to serve the proposed development.

The overall water portfolio for the Santana Ranch Project is:

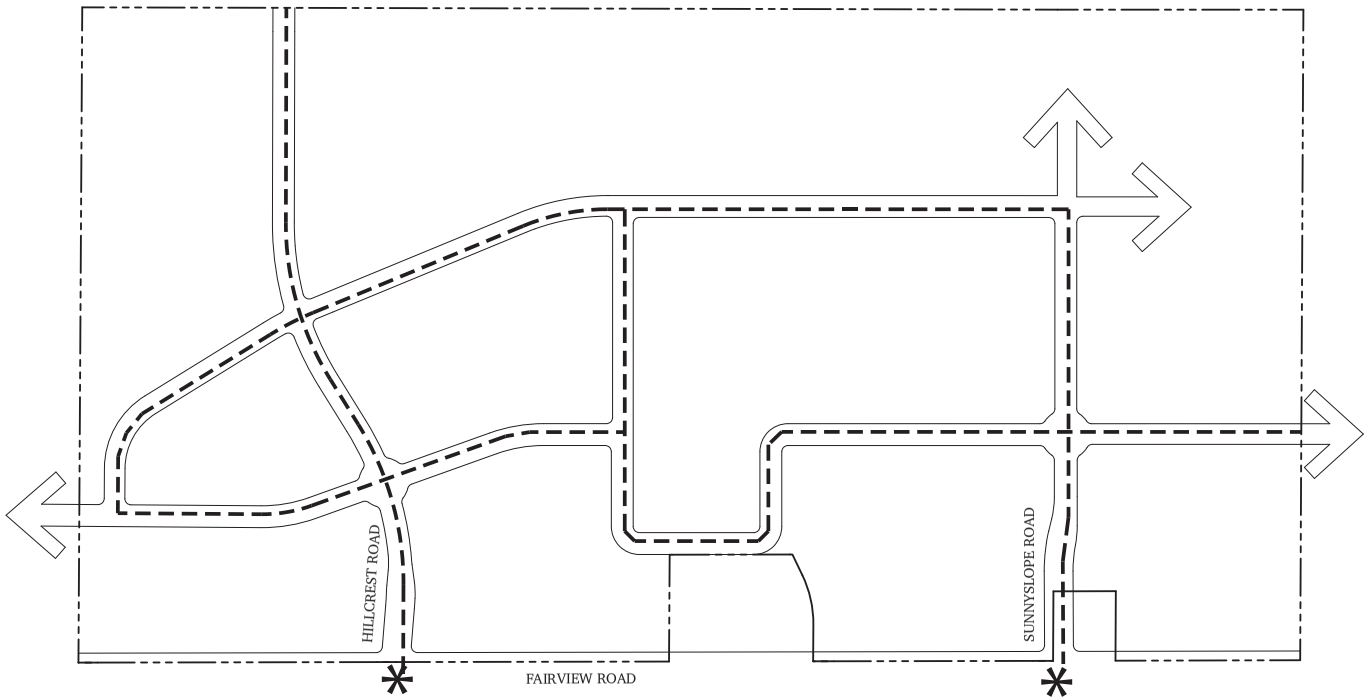
Table V. Annual Water Portfolio				
	Source/Purveyor	**Annual Supply**	**Units**	**Yearly Quantity (acre-feet)**
1	**Central Valley Project** "Municipal and Industrial water" (M&I) from San Benito County Water District CVP Project *	0.6 acre-feet (50% of 1.2 acre-ft allotment)	292.0 acres	175.2
2	**City of Hollister** (based on 1972 agreement for APNs 25-37-0-004 and 25-19-0-001)	0.33 acre-feet per dwelling unit	300 homes	99.0
			Available Non-SSCWD Sources =	**274.2**
3	**Required from Sunnyslope County Water District** supply from existing and new groundwater wells.			**109.7**
			Total =	**383.9**

* Assumed CVP allotment is 50 percent of contracted amount

The number of wells needed to serve the proposed Santana Ranch development will be determined by the production rate of the new wells. Additional wells will be necessary to serve as a back-up to the primary well(s).

Additional water supply could also be obtained by installing water conservation improvements at public buildings and grounds (e.g., park or school irrigation system upgrades, toilet retrofits, etc). This will entail working with the appropriate water agency to develop this approach.

Exhibit E-1 shows a conceptual "backbone" water system based on the current street configuration for the project.



N.T.S.

LEGEND

- WATER SYSTEM TO BE LOOPED IN LOCAL STREETS
- PROJECT BOUNDARY
- WATER MAIN LOOP TO EXISTING SYSTEM

FIGURE E-1
PROPOSED "BACKBONE"
WATER SYSTEM
SANTANA RANCH
SAN BENITO COUNTY, CALIFORNIA
OCTOBER 2008
062038

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Storm Drainage

Existing Conditions

As stated earlier in this report, the project site can be characterized as gently sloping to hilly with slopes ranging from 15% to less than 5%. The elevations across the property vary from 370 feet (at the northern perimeter) to 490 feet (near the southern boundary).

A defined flow route (or other storm drainage system facilities) that conveys the existing runoff from the project site to a public storm drain system does not currently exist. Storm run-off for the western half of the project appears to flow toward a roadside swale along Fairview Road and then to the north, eventually discharging into Santa Ana Creek. Drainage of the eastern half of the project sheet flows north-west eventually reaching Santa Ana Creek.

Proposed Drainage

Catch basins in streets and inlets in other improved areas will collect storm runoff and convey it to new on-site drainage basins via an underground storm drainage system

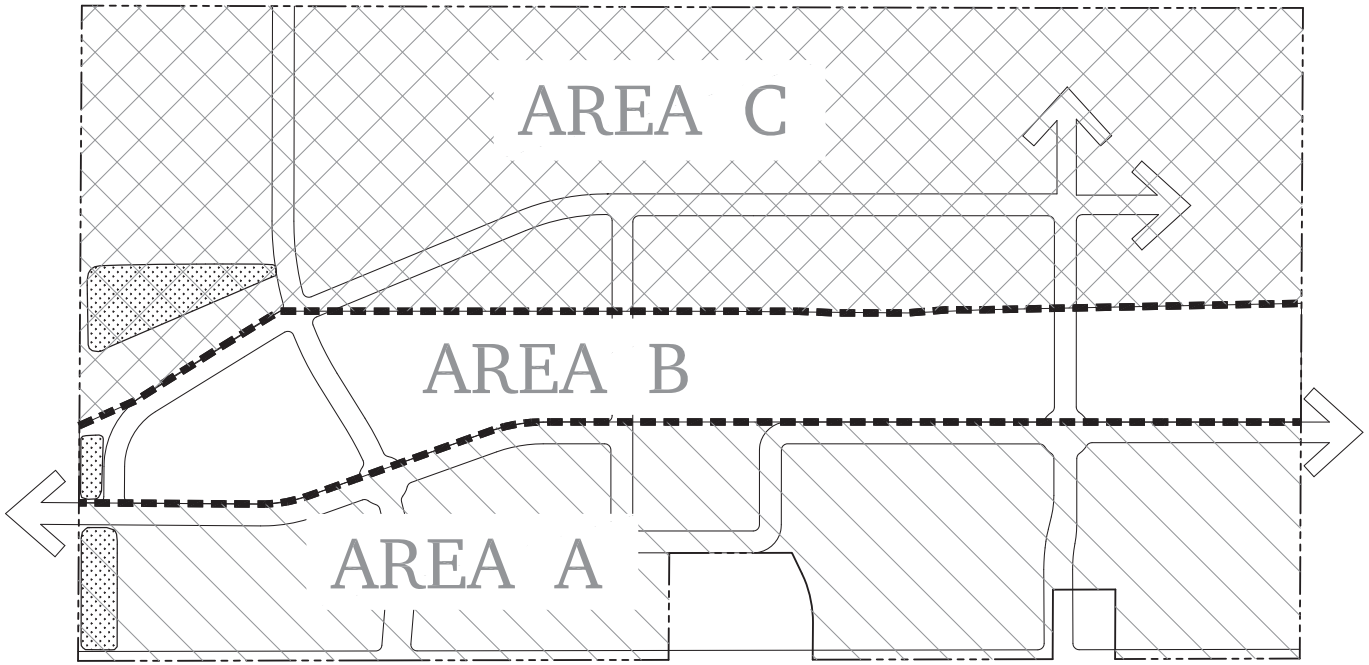
The grading concept for the Santana Ranch project is to divide the site into three drainage areas. Each drainage area (Areas A thru C) will have its own detention basin or retention pond sized to hold the 100-year 24-hour storm event. The other drainage areas, depending on subsurface soil conditions encountered, will be either a retention pond if permeable soils are present or a detention basin.

Drainage Areas A thru C will release to an existing City of Hollister 36-inch storm drain line in Fairview Road as planned for in the City's 2001 Storm Drain Master Plan by MacKay & Somps. This will require the replacement of an existing 36-inch line with a new 42-inch line farther down stream to accommodate development of Santana Ranch and neighboring parcels as assumed in the Storm Drain Master Plan.

The other drainage areas within Santana Ranch were not accounted for in the City's 2001 Storm Drain Master Plan. If detention basins are used for Areas A, B, C, D, F and H a storm drain line (sized for this project's storm water discharge) will be designed and constructed to convey the storm water flows north along Fairview Road in order to outfall into Santa Ana Creek, approximately 3,600 feet north.

Detention basins will be designed for release at the 10-year pre-development flow rate as required by the San Benito County Public Works Department. The conceptual basin locations on the exhibits are preliminary and will be reviewed and refined during final design.

See Figure F-2 for the proposed "backbone" storm drain system improvements.



LEGEND

- STORM DRAIN (GRAVITY FLOW)
- CONCEPTUAL DETENTION BASIN OR RETENTION POND LOCATION
- PROJECT BOUNDARY

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FIGURE F-1
PROPOSED STORM DRAIN
TRIBUTARY AREAS
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SAN BENITO COUNTY, CALIFORNIA
OCTOBER 2008
062038

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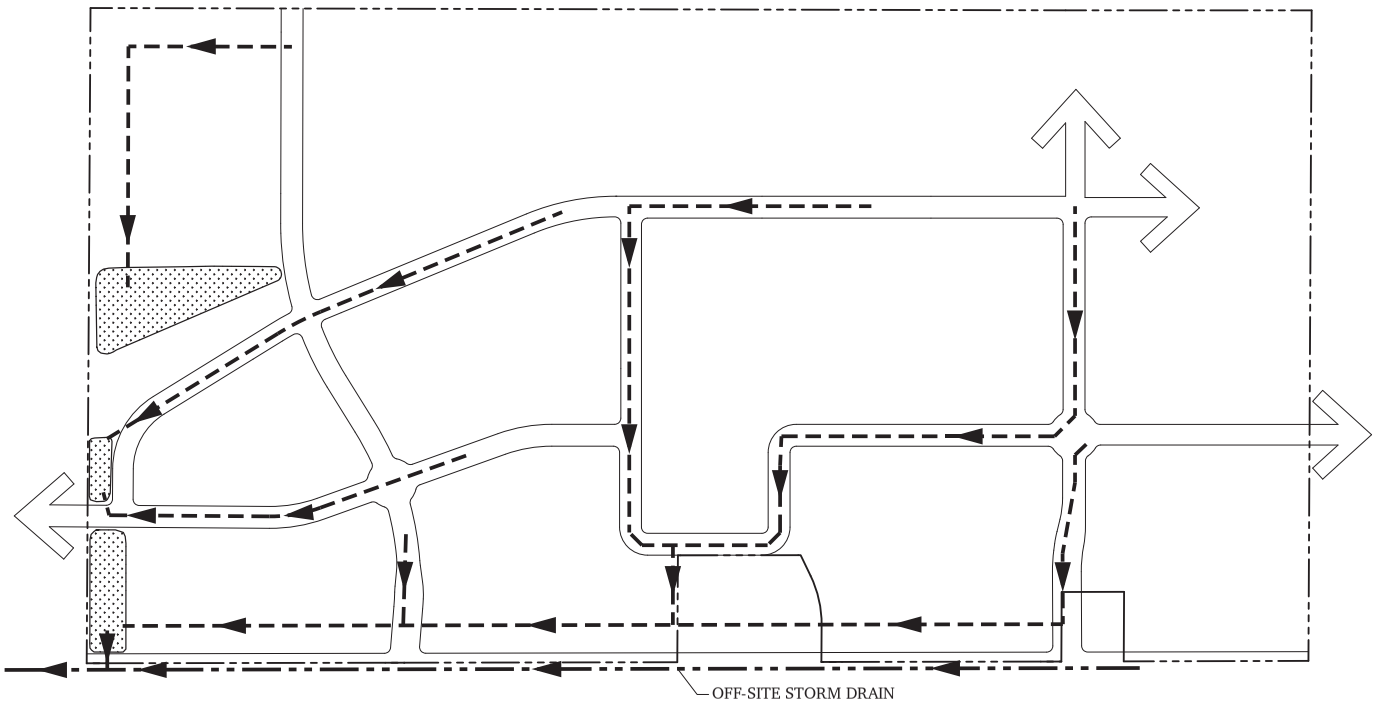

LEGEND

- ON-SITE STORM DRAIN (GRAVITY FLOW)
- OFF-SITE STORM DRAIN (GRAVITY FLOW)
- CONCEPTUAL DETENTION BASIN OR RETENTION POND LOCATION
- PROJECT BOUNDARY

N.T.S.

FIGURE F-2
PROPOSED "BACKBONE"
STORM DRAIN SYSTEM
SANTANA RANCH
SAN BENITO COUNTY, CALIFORNIA
OCTOBER 2008
062038

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Storm Water Quality

The project will conduct grading operations, install underground piping and conduit facilities, install asphalt and concrete surface improvement, construct building and install landscaping and recreational facilities. All of these construction operations will comply with NPDES Permit requirements regarding erosion control, rainy season restrictions, runoff control, dust control, etc.

The following Storm Water Quality Mitigation Measures are proposed for the project:

Site Drainage System

- All new public facilities will conform to the County of San Benito standard details.
- The design of storm water collection and conveyance systems will minimize erosion and other potential problems for on-site and adjacent properties.
- Areas of impervious surfaces in the residential areas will be minimized where possible to reduce runoff.
- The residential design includes active and passive open spaces, thereby helping to minimize increases in impervious surfaces and associated site runoff.
- Educational flyers and other materials will be supplied to the residential users to increase their understanding of water quality and best management practices.
- The project will include storm drain system signs or stenciling with language to discourage illegal dumping of unwanted materials into the catch basins and field inlets.
- The commercial uses will include on-site sediment and oil filtering devices for the pretreatment of the major paved areas (as required).

Water Quality

During construction:

- The project will implement construction Best Management Practices (BMPs) to ensure that water quality is protected.
- Construction BMPs include the erosion control measures, sediment transfer reduction measures and dust control measures.
- All contractors and personnel will be trained in proper construction Best Management Practices prior to construction activity. In addition, the site developer will retain a construction manager familiar with NPDES permit

requirements to monitor construction activities. These measures would reduce potential construction impacts to water quality.

- The project will use native plants and drought-tolerant landscaping wherever possible. The project will also install efficient irrigation systems, such as drip irrigation and automatic irrigation systems to minimize excess runoff.

Post-Construction Water Quality

Residential Areas:

- The project Developer will provide information and instructions to potential project residents before paperwork is finalized on their homes, regarding water quality, Best Management Practices.

- Public Education/Participation activities. The Developer will provide information to new project residents regarding pollution prevention.

- The project will include requirements for possible Homeowners Association, service districts and Commercial users to implement the following measures within any common landscaping and open space areas;

    - Materials Use Controls, which include good housekeeping practices (storage, use and cleanup) when handling potentially harmful materials, such as cleaning materials, fertilizers, paint, and where possible using safer alternative products;

    - Material Exposure Controls, which prevent and reduce pollutant discharge to storm water by minimizing the storage of hazardous materials (such as pesticides) onsite, storing materials in a designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors;

        - Material Disposal and Recycling, which includes storm drain system signs and stenciling with language to discourage illegal dumping of unwanted materials.

- The project will include a prohibition on the dumping of waste (solid waste, liquid and yard waste) into storm drain systems, open space areas, and creeks;

- The project will include provisions for private street, parking lot and storm drain maintenance activities. These activities control the movement of pollutants and removal of them from the pavement through catch basin cleaning, storm drain flushing, street sweeping, and by regularly removing illegally dumped material from the project site.

Commercial Areas:

- The commercial areas will include the following measures within any private and/or common landscaping and open space areas;

    - Materials Use Controls, which include good housekeeping practices (storage, use and cleanup) when handling potentially harmful materials, such as cleaning materials, fertilizers, paint, and where possible using safer alternative products;

    - Material Exposure Controls, which prevent and reduce pollutant discharge to storm water by minimizing the storage of hazardous materials (such as pesticides) onsite, storing materials in a designated area, installing secondary containment, conducting regular inspections, and training employees and subcontractors;

- The commercial uses will include a prohibition on the dumping of waste products (solid waste/liquid waste and yard trash) into storm drain systems, open space areas, and creeks; which includes storm drain systems signs and stenciling with language to discourage illegal dumping of waster products.

- The commercial operators will be responsible for private street, parking lot and storm drain maintenance activities. These activities control the movement of pollutants and removal of them from pavement through catch basin cleaning, storm drain flushing, street sweeping, and by regularly removing illegally dumped material from the project site.

- The commercial operators will be responsible for the inspection, maintenance and repair of sediment and oil filtering devices for the pretreatment of the major paved areas.

Recycled Water

Recycled water for Santana Ranch will be provided by the private sewage treatment plant.
The proposed use of recycled water includes landscape irrigation of parks, detention basins, schools, landscape corridors of major roads, commercial site and common area open space within multi-family housing sites. No recycled water is planned for use on any portion of single family homes. Exhibit G-1 conceptually shows the recycled water irrigated lands based on the current street configuration for the project.

Table V summarizes the estimated irrigation lands to be served by recycled water.

Table V. Estimated Landscape Irrigation

Land Use	Area (acres)	% Irrigated	Irrigation Area (acres)	Irrigation Area (square feet)
Multi-Family Residential	48.00	25%	12.00	522,720
Parks	18.20	90%	16.38	713,513
Mixed Use	5.9	5%	0.309	13.068
Neighborhood Commercial	6.00	5%	0.30	13,068
Public Road Landscaped Areas*	9.71	90%	8.74	380,700
School	8.00	40%	3.20	139,392
Detention Basin	7.90	90%	7.11	309,712
Grand Total =			**48.00**	**2,092,172**

*Fairview Road, Hillcrest Road, Sunnyslope Road, Orchard Park Road and School Road only.

Santana Ranch will be required to conform to the San Benito County Water Conservation Plan. The plan's provisions include a maximum allowable water budget for new landscape areas. The formula and results for maximum allowable water budget can be found below.

MAWB = (ETo) (0.8) (LA) (0.62)

MAWB = maximum allowable water budget (gallons per year)
ETo = reference evapotraspiration: 45.1 inches per year for Hollister
0.8 = allowable percentage of water budgeted for landscape per year
LA = landscape area (square feet)
0.62 = conversion factor to gallons per year

MAWB = (45.1)x(0.8)x(2,092,172)x(0.62) = 801,000 gallons per year

The maximum allowable water budget for Santana Ranch is 46,801,000 gallon per year or approximately 143 acre-feet, well below the amount of recycled water produced by the private treatment plant (see Appendix B). Therefore there will be recycled water available for use in other areas.

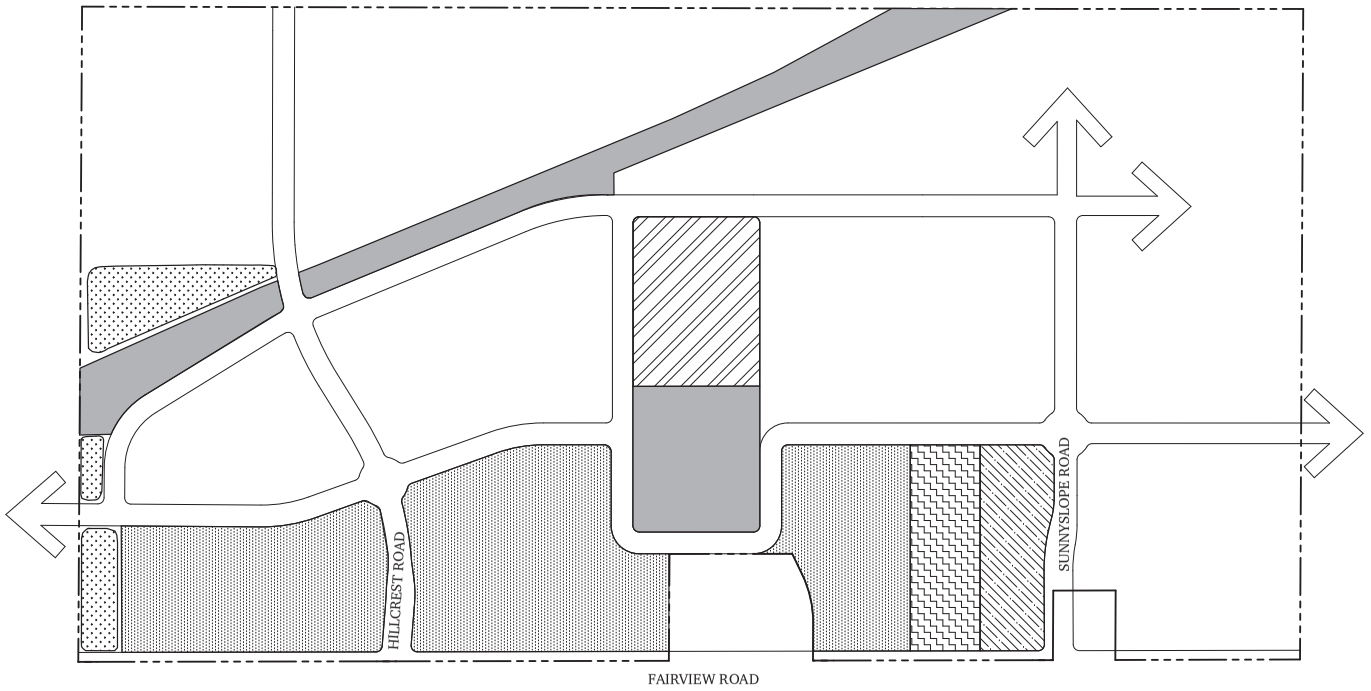
The San Benito County Water Conservation Plan encourages developers to design landscapes that use less water than the maximum allowable water budget. The estimated water use formula is used to do this. This formula takes into account average year climate, landscape area, mix of plants used and irrigation system efficiency. The estimated water use formula and result can be found below.

EWU = (ETo) (KI/IE) (LA) (0.62)

EWU estimated water use (gallons per year)
ETo = reference evapotraspiration: 45.1 inches/year for Hollister
KI = landscape coefficient: estimated water use of selected group of plants
IE = irrigation efficiency 0.65: design efficiency and management efficiency
LA = landscape area (square feet)
0.62 = conversion factor to gallons per year

EWU = 33,987,000 gallons per year

Santana Ranch will use between 33,987,000 and 46,510,000 gallons per year or an approximate range of 104 to 143 acre-feet of recycled water for landscape irrigation. This range is well below the amount of recycled water produced by the project's water reclaimed facility. The remaining reclaimed water will be recharged into the ground water system through a series of leach lines in the project parks and open space areas.



N.T.S.

LEGEND

- DETENTION BASIN
- PARK
- SCHOOL
- MULTI-RESIDENTIAL
- COMMERCIAL
- COMMERCIAL MIX USED
- PROJECT BOUNDARY

FIGURE G-1
RECYCLED WATER IRRIGATION
SANTANA RANCH
SAN BENITO COUNTY, CALIFORNIA
OCTOBER 2008
062038

RJA
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VII. Storm Drainage

Existing Conditions

As stated earlier in this report, the project site can be characterized as gently sloping to hilly with slopes ranging from 15% to less than 5%. The elevations across the property vary from 370 feet (at the northern perimeter) to 490 feet (near the southern boundary).

Under current conditions, drainage is generally flowing from south-east to north-west direction. Drainage from the southern portion of the plan area (approximately 10 percent of the site) flows toward Fairview Road where a portion of the runoff enters a metal corrugated pipe and is conveyed westward via a 36-inch storm drain to a city storm drain in Hillcrest Road and ultimately to Santa Ana Creek. Runoff from Fairview Road is collected in a roadside swale running along the western side of Fairview Road, flowing north and ultimately discharging into Santa Ana Creek. The roadside swale also ultimately collects existing plan area runoff (approximately 90 percent of the plan area) either from plan drainage patterns generally flowing in a south-east to north-west direction. All runoff entering the roadside swale north of the corrugated pipe culvert, is carried north to Santa Ana Creek. Current predevelopment peak runoff rates leaving the plan area are 67 cubic feet per second (cfs) for the 10-year storm and 94 cfs for the 100-year storm event.

Proposed Drainage

The Plan Area will contain three major drainage areas. See Figure G-1 for the proposed storm drain tributary areas. Storm water flows for the drainage areas will be collected by underground conduits or open surface channels, and be collected in at least two detention basins or through a combination of above and below ground detention basins. Above ground detention basins would be open ponds or open areas used in stormwater detention. Below ground detention systems would consist of large storm drain pipes or other structures. Detention basin volumes will collect and detain the difference between 10-yr predevelopment and 100-yr post development flow rates.

Drainage Area C contains approximately 41 acres and generally flows north to the northwest, towards Fairview Road, where storm drain runoff will be collected in a 36” pipe that will discharge into a detention basin at the north boundary line. This area is bound by Fairview Road on the west and the project boundary to the south. The required storm water detention for Drainage Area C is estimated at approximately 0.23 acre feet. Metered release of the Drainage Area C basin flows into an existing road swale along the east side of Fairview Road, where flows eventually discharge to Santa Ana Creek approximately 3,600 feet north of the Plan Area boundary.

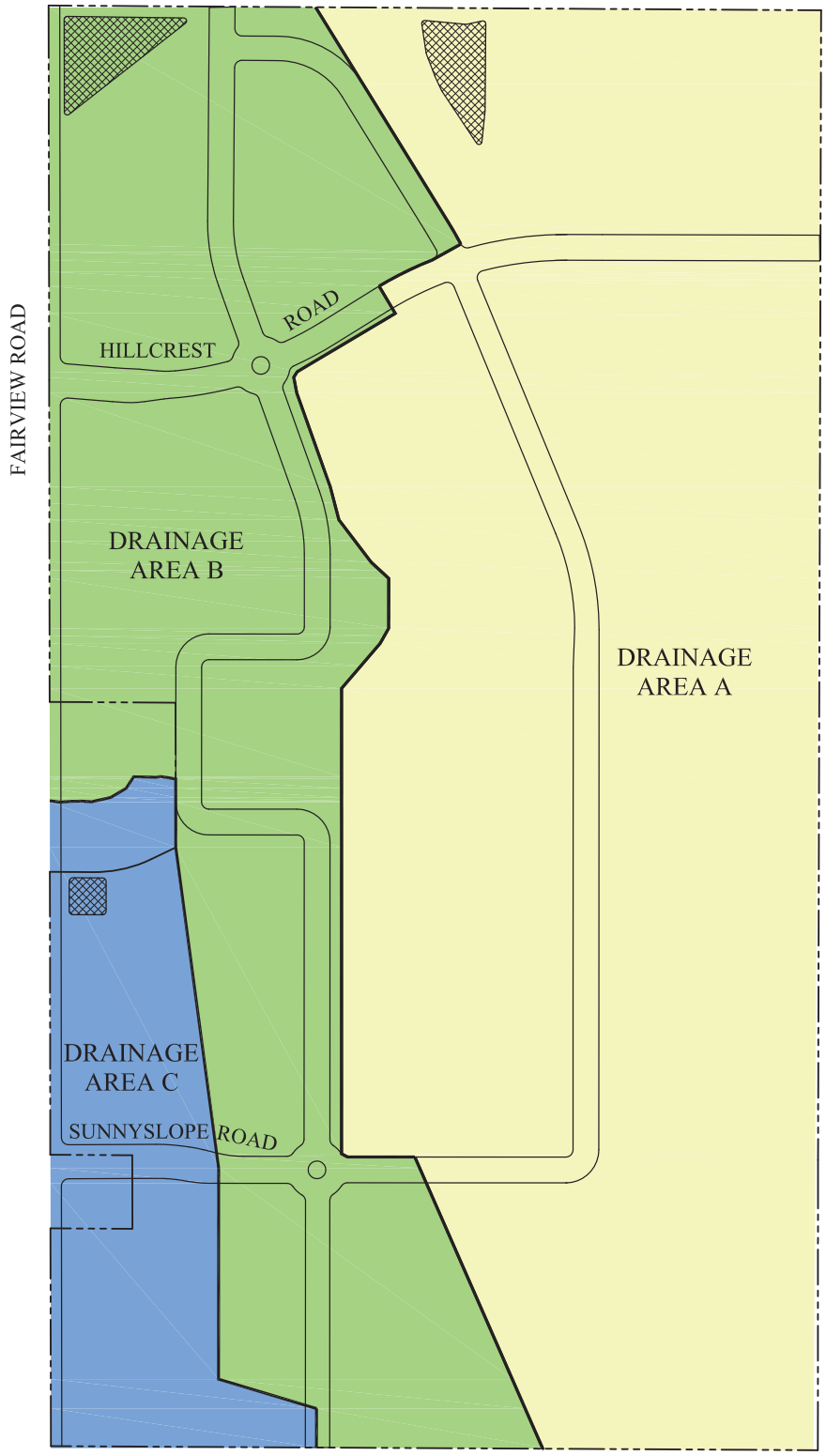
Drainage Area B contains approximately 85 acres and generally flows north to the northwest towards Fairview Road. A new storm drain line in Park Center Drive would collect and eventually take storm runoff to a basin on the north boundary of the Plan Area. The required storm water detention for drainage area B is estimated to be 11.5 acre feet. Metered release of the basin would occur at the existing road side swale on Fairview Road, and eventually reach

Santa Ana Creek north of the Plan Area.

Drainage area A contains approximately 170 acres and generally flows north the northern project boundary. A new storm drain in Orchard Park Road would collect and eventually take storm runoff to a basin on the north boundary of the Plan Area. The required storm water detention for Drainage Area A is estimated to be 11.5 acre feet. Metered release of the basin would occur and eventually reach Santa Ana Creek north the Plan Area.

Detention basins will be designed for release at the 10-year pre-development flow rate as required by the San Benito County Public Works Department. The conceptual basin locations on the exhibits are preliminary and will be reviewed and refined during final design.

See Figure G-2 for the proposed “backbone” storm drain system improvements.



LEGEND

- DRAINAGE AREA A
- DRAINAGE AREA B
- DRAINAGE AREA C
- DETENTION BASIN

N

NOT TO SCALE

FIGURE G-1
CONCEPTUAL
STORM WATER TRIBUTARY AREAS
SANTANA RANCH
SAN BENITO COUNTY, CALIFORNIA
SEPTEMBER 2009
062038

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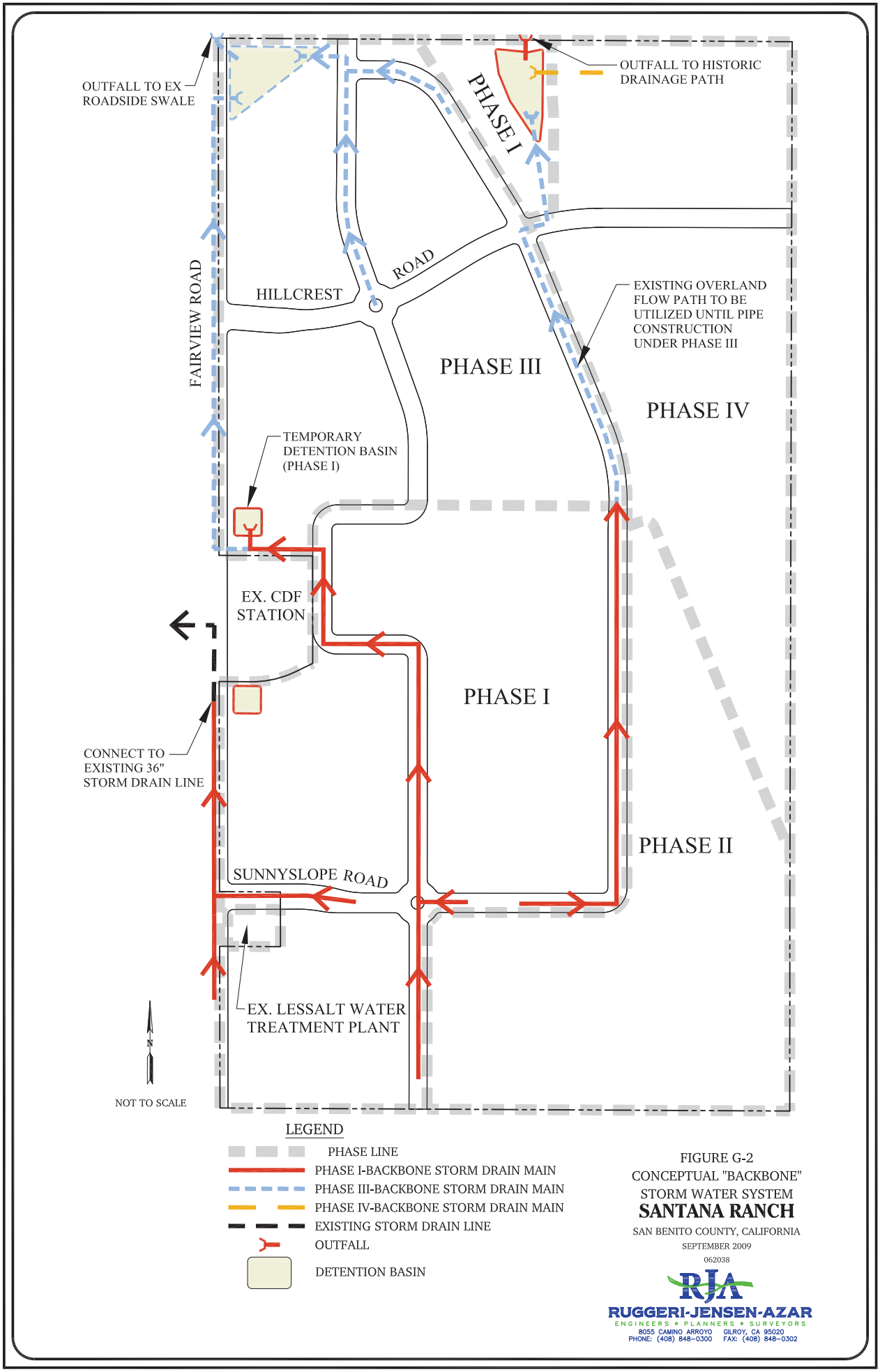

FIGURE G-2
CONCEPTUAL "BACKBONE"
STORM WATER SYSTEM
SANTANA RANCH
SAN BENITO COUNTY, CALIFORNIA
SEPTEMBER 2009
062038

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APPENDIX A

- Excerpt from February 2005 Marina Coast Water District Wastewater Collection System Master Plan with Wastewater Unit Flow Factors

- Excerpt from 2005 Marina Coast Water District Urban Water Management Plan with Water Use Factors.

Table 7.1– Design Criteria Table

Category	Parameter	Criteria
Gravity Pipe Hydraulics	Manning's n	0.013
	Peak Flow Max d/D	0.67 (12" pipe or smaller)
		0.90 (15" pipe or larger)
	Max Velocity	8.0 fps
	Min Velocity	2.0 fps
Force Main Hydraulics	Manning's n	0.013
	Max Velocity	6.0 fps
	Min Velocity	2.0 fps
Manhole Hydraulics	Velocity Headloss Coefficient (K)	0.5
Residential Densities	Single Family Residential	8.0 du/ac
	Multi Family Residential	13.5 du/ac
Wastewater Use Factor	Non-Residential	90% of water demand
Unit Flow Factors	Single Family Residential (Existing)	60 gpcd
	Multi Family Residential (Existing)	60 gpcd
	Single Family Residential (New)	90 gpcd
	Multi Family Residential (New)	90 gpcd
	Mixed Use	4215 gpd/ac
	Schools	25 gpd/student
	Retail Service	2939 gpd/ac
	Warehouse, Light Industrial	350 gpd/ac
	Public Facility	1400 gpd/ac
	Office	2520 gpd/ac
	Hotel/Motel	150 gpd/room
Peaking Factors	Definition	PDWF/ADWF
	Flow Monitoring Basin 1	1.99
	Flow Monitoring Basin 2	1.72
	Flow Monitoring Basin 3	2.38
	Flow Monitoring Basin 4	1.56
	Flow Monitoring Basin 5	2.51
	Flow Monitoring Basin 6	1.56
	Flow Monitoring Basin 7	1.86
	Armstrong Ranch	1.94
I/I Factor	Return Frequency	25-Year
	Duration	6 Hours
	I/I Factor (Existing and New Developments)	44% of ADWF
Design Flow	ADWF	ADWF
	PDWF	ADWF x PF
	PWWF	ADWF x (PF + I/I Factor)
Lift Station Design Capacity	Lift Station #2	860 gpm
	Lift Station #3	375 gpm
	Lift Station #5	210 gpm
	Lift Station #6	165 gpm

Table 3.3 Water Demand Factors Applied in the UWMP

Land Use	Use Factor in AF/Y
SF Residential - <5 units/acre	0.5
SF Residential - 5-8/du acre	0.33
Residential - 8-15 du/acre	0.25
Multi family >15/acre	0.25
Hotel/Motel and Timeshares/unit	0.17
Retail	0.00021/sf
Restaurant (@9 sqft./seat *.7gsf)	0.029/seat
Office/R&D	0.000135/sf
Other Commercial	0.0003/sf
Light Industrial	0.00015/sf
Governmental (corporation yard 0.25 af/acre)	0.0003/sf
Institutional	0.0003/sf
Schools k-12	0.0003/sf
Higher Education	0.0003/sf
Improved Landscaping	2.1/acre
Turf	2.5/acre

Note: residential factors aggregate indoor and outdoor use; non-residential factors are indoor use only.

Table 3.4 shows that sufficient available water exists within the Marina service area to meet expected demands through 2025 with a surplus of about 688 AF/Y. In the Ord Community the approved FORA Base Reuse Plan limits the amount of planned development by the land use jurisdictions. If that limitation were lifted, and the long-term development that is projected by the land use jurisdictions beyond the current limits now imposed by the Base Reuse Plan were permitted and constructed in the future, additional water supplies beyond the planned 2,400 AF/Y Regional Urban Water Augmentation Project would be required. On June 10, 2005, the MCWD and FORA board of directors endorsed the "hybrid alternative" from the September 2004 Regional Urban Water Augmentation Project EIR. This Project need is consistent with water required by the existing

APPENDIX B

- Conceptual Design Report for On-site Water Reclamation Facility by PERC Consultants

01/2038
Sanitary Sewer

N.E. FAIRVIEW

WATER RECLAMATION FACILITY

Conceptual Design Report

Prepared for:

N.E. FAIRVIEW PROPERTY OWNERS

Detail Solution

PERC

JUNE 2018

Pacific Environmental Resources Corp.
17520 Newhope Street · Suite 140 · Fountain Valley, California 92708 · tel: 714-481-7270 · fax: 714-481-7269 · [illegible]

July 13, 2006

N.E. Fairview Property Owners
1851 Airway Drive Suite E
Hollister, CA 95023
(831) 636-9999

Subject: **N.E. Fairview Water Reclamation Facility**
Conceptual Design Report Proposal

Dear N.E. Fairview Property Owners:

PERC is pleased to submit our Conceptual Design Report (CDR) for the N.E. Fairview Water Reclamation Facility (WRF) to be located in Hollister, California. This CDR has been prepared based on our recent discussions and earlier meetings regarding the N.E. Fairfield project. We look forward to presenting this CDR to you and answering any questions you have.

This CDR assumes a new standalone WRF designed to provide treatment capacity of 320,000 gallons per day (GPD) maximum month average dry weather flow as outlined in the Basis of Design (Section C of this CDR) which will accommodate the needs of the development for approximately 1,280 equivalent dwelling units. PERC will guarantee the effluent results as outlined in our Facility Warranty (Section B of this CDR). In addition, the design/build/operate costs outlined in this CDR are guaranteed fixed costs indexed to the Engineering News Record Construction Cost Index.

Following acceptance and approval of this CDR, we will incorporate the contents into a Design/Build/Operate Agreement and proceed with preparation of construction shop drawings (final design).

We appreciate the opportunity to work with N.E. Fairview Property Owners on this important step of development and look forward to a long term relationship that will result in a successful project.

If you have any questions, please contact me at 714-481-7270.

Sincerely,
PERC

Robert Nespeca
Vice President

Overview

As an integrated Design / Build / Operate firm, PERC provides a Total Solution™ to Owners whereby the responsibility for design, construction, startup, operations and performance lies with PERC. The advantage of the PERC Total Solution™ is the Developer and Owner will receive a performance guarantee of water quality, and a guaranteed Design/Build and Operating cost for the Facility at the Conceptual Design phase of the project.

PERC ASP®

Through extensive research and experience, PERC has formulated its own trademarked design, which allows us to provide efficient, environmentally sensitive solutions for wastewater treatment. The PERC ASP® (Activated Sludge Process) design technology is based upon highly dependable Sequential Batch Reactor technology which incorporates small footprint tanks and aesthetically pleasing buildings.

All treatment takes indoors, eliminating unpleasant odors, maximizing public appeasement and minimizing required land for the facility. The small footprint design allows the utilization of the land around the treatment facility resulting in land to be utilized for alternate uses.

PERC DBO Project Approach

The following outlines the approach and steps PERC applies to each project:

1. Conceptual Design Phase
   PERC considers this phase to be critical in the project life as this phase establishes the foundation of the project so that all parties' expectations are met. A critical step in the process of Design / Build / Operate is to clearly outline the expectations of the project, define the scope of work and provide a guaranteed fixed price associated with the defined scope of work.

   - Conceptual Design Report Proposal
     The first step in this phase is to submit a proposal to the Owner for a Conceptual Design Report which confirms the current design assumptions for the Facility, suggests appropriate phasing based on development growth and provides a design / build / operate cost range.

   - Conceptual Design Report
     Following acceptance and approval of the Conceptual Design Proposal, PERC shall prepare a Conceptual Design Report based on the parameters of the proposal, which shall include the following items:

- Process Description
- Conceptual Drawings
- Critical Path Schedule
- Outline Specifications / General Clarifications for Design / Build
- Operations and Maintenance Analysis
- PERC Technology Review
- Guaranteed Design/Build Cost for each phase authorized
- Guaranteed Operations and Maintenance ("O&M") Analysis

The Conceptual Design Report can be completed within 60 days from the authorization to proceed.

- Design / Build / Operate Agreement
  Consistent with our goal of managing expectations, the contents of the approved Conceptual Design Report will become a part of the contract documents, and integrated as Exhibits to the Design / Build / Operate Agreement.

2. Final Design / Construction Shop Drawings Phase
Construction Shop Drawings are prepared based on the approved Conceptual Design and consistent with the requirements of the contract documents. Construction Shop Drawings are not intended as bid documents and are documents to be utilized by the Design / Builder to construct the Facility in accordance with the contract documents and to comply with the performance specification outlined in the contract documents.

The Construction Shop Drawings shall include the following items:

- Permitting
- General Design Drawings
- Civil
- Mechanical and Process
- Structural
- Electrical
- Architectural
- Instrumentation

During this phase of the project, PERC will interact and educate the community about the new Facility and the benefits to the environment. It is critical to obtain acceptance of the new Facility and provide the assurance to the community that the new infrastructure is intended to improve the water quality for the community.

Following the completion of the Construction Shop Drawings, PERC will facilitate obtaining all necessary permits required for the construction and operation of the Facility.

3. General Construction Phase

This phase of the project will commence following approval of all Construction Shop Drawings, issuance of all required permits and a written notice to proceed issued by the Developer / Owner to proceed with the construction of the Facility. PERC shall enter into contracts with preferred local subcontractors who comply with the strict requirements of PERC to ensure quality workmanship and timely performance. The following activities are performed during this phase of the project:

- Site construction
- Construction of tank structures
- Operations buildings / office space
- Mechanical piping and equipment installation
- Electrical for process equipment and buildings
- Controls and instrumentation

During the construction phase of the project, engineering services shall be provided which shall include the following activities:

- Construction Observation and Administration
- System Startup
- Operations and Maintenance Manuals

4. Startup and Testing Phase

Upon completion of the General Construction Phase and issuance of the Letter of Substantial Completion by the Engineer of Record, PERC staff will commence start up and testing of the Facility. The following activities will be performed during this phase of the project:

- Field checkout of all process equipment
- Verification of control system operation
- Clean water testing
- Facility biomass seeding
- Process establishment and startup
- Performance testing
- Regulatory approval of facility
- Ongoing operation

5. Operations and Maintenance ("O&M") Phase

Upon completion of the startup phase and assuming sufficient wastewater flow and load, full flow operations of the Facility shall commence. The Facility will be operated in accordance with the O&M manuals prepared during the General

Construction phase. The O&M services provided by PERC shall include the following:

- Staffing by certified wastewater operators
- Equipment preventative and routine maintenance
- Solids handing and disposal
- Lab testing and analysis
- Monthly O&M reporting
- Emergency preparedness
- Regulatory reporting and recordkeeping

During the O&M phase, PERC shall provide the Owner with a performance guarantee of the Facility in accordance with the performance specification included in the Design/Build contract documents for as long as PERC is operating the Facility. In addition, as part of PERC's O&M service, extended warranties on equipment shall be provided.

Design/Build Warranty. PERC will warrant and guarantee to the Owner for a period of two (2) years after the Substantial Completion that the WRF will be constructed and installed in a good and workmanlike manner using all new materials and equipment and in compliance with the plans and specifications approved by the Owner. Substantial Completion is defined as the date when the WRF has successfully completed the required clean water test. If PERC has entered into a five (5)-year Operations and Maintenance (O&M) Service Agreement with the Owner for the WRF, the design/build warranty shall be extended for up to a period of three (3) years from the date of Substantial Completion.

Certain equipment warranties may be extended beyond two (2) years following Substantial Completion. PERC will assign all warranties and guarantees from contractors and suppliers to the Owner and its assigns on a non-exclusive basis.

Performance Warranty. PERC will provide the Owner with a performance warranty for so long as PERC performs the O&M for the WRF that if the design influent characteristics below are satisfied the WRF will produce effluent levels as shown in the table below and in accordance with California Title 22 Disinfected Secondary - 2.2 Recycle Water Standards.

Parameter	Design Influent Characteristics	PERC Warrantee Effluent Characteristics	Measure
Max Monthly Average Dry Weather Flow Capacity, gpd	320,000		Influent Flow Meter
Minimum Flow Capacity, gpd	5,000		Influent Flow Meter
Total Coliform (CFU/100 ml)	N/A	≤2.2 ≤23	Seven Day Median Single Sample Max
Biochemical Oxygen Demand, mg/L	350	10	Monthly Mean Average
Total Suspended Solids, mg/L	300	10	Monthly Mean Average
Total Nitrogen, mg/L	40	10	Monthly Mean Average
Turbidity, mg/L	N/A	≤2 NTU ≤5 NTU	24 Hour Average Single Sample

Influent Design Flows and Concentrations

Based on the information provided to PERC and our experience with similar developments in the area, the following treatment design assumes an influent wastewater with the following concentrations and loading conditions:

	Concentration	Average Daily Load	Maximum Month Load
BOD5	350 mg/l	788#/day	934#/day
TSS	350 mg/l	788#/day	934#/day
TKN	40 mg/l	90#/day	107#/day

The following indicates the proposed design flows for the facility:

Annual Average Day Flow	270,000 GPD (188 GPM)
Maximum Month Day Flow	320,000 GPD (222 GPM)
Maximum Day Flow	640,000 GPD (444 GPM)
Peak Hour Flow	960,000 GPD (667 GPM)

Definitions:

BOD5 – 5-day Biological Oxygen Demand is a measure of the level of contamination of the wastewater and is used to size certain processes and equipment. Biological treatment requires a minimum amount of BOD to function properly and typically has a maximum capacity, that when exceeded, will allow contamination to flow through the plant.

TSS – Total Suspended Solids is a measure of the particulate (non-dissolved) mass in the wastewater. It is typically used to determine the clarity of the water and may help determine the amount of waste sludge the facility will generate.

TKN – Total Kjeldahl Nitrogen is a measure of the nitrogen content of raw wastewater which is the product of adding the Organic + Ammonia + Ammonium. It does not include Nitrate or Nitrite which are typically not present in raw wastewater due to septic conditions.

TN – Total Nitrogen is a measure of the nitrogen content of final effluent which includes all chemical forms.

Average Annual Day Flow – Sewer flow volume expected in a 24-hour period based on the annual volume averaged over 365 days. This flow rate is typically used to define the facility capacity with respect to number of persons served and for effluent reuse planning.

Maximum Month Day Flow – The highest sewer flow volume expected in a month averaged over a 30-day period. This flow rate is typically used to define the biological treatment capacity of the reclamation facility.

Maximum Day Flow – Maximum sewer flow expected in any one 24-hour period within a year. This flow rate is typically used to define the hydraulic capacity of the unit processes following

flow/surge attenuation.

Peak Hour Flow – Maximum sewer flow expected in any two-hour period within a year. This flow rate is typically used to size the influent pumping station and headworks (screening and grit removal) of the treatment facility and to determine the amount of surge attenuation required for the secondary and tertiary treatment processes.

Influent Lift Station

It is assumed that raw wastewater from the development will flow from the sewer collection system by gravity to the treatment facility. Therefore, an influent lift station will be required to be constructed as part of the WRF. The lift station will consist of a duplex pump system contained in an 8' x 10' pre-cast concrete wet well with an average working volume of approximately 2,400 gallons. At this time, a sewer master plan has not been developed, therefore, the flow line of the influent sewer is assumed to be a maximum of 8' below existing grade. Two lift pumps will be installed to convey the wastewater to the headworks screening unit. Each pump will be sized to provide the peak-hour capacity of the facility. The pumps will be Flygt C-series units or Engineer Approved Equal.

Headworks

From the lift station, the wastewater will be pumped to an enclosed headworks room, where the wastewater will be screened. The screening equipment will be a rotary drum screen with a capacity rated at the peak hour flow. The screenings will be discharged to a dumpster for disposal using a conveyor unit. The screening unit will be manufactured by IPEC or Engineer Approved Equal.

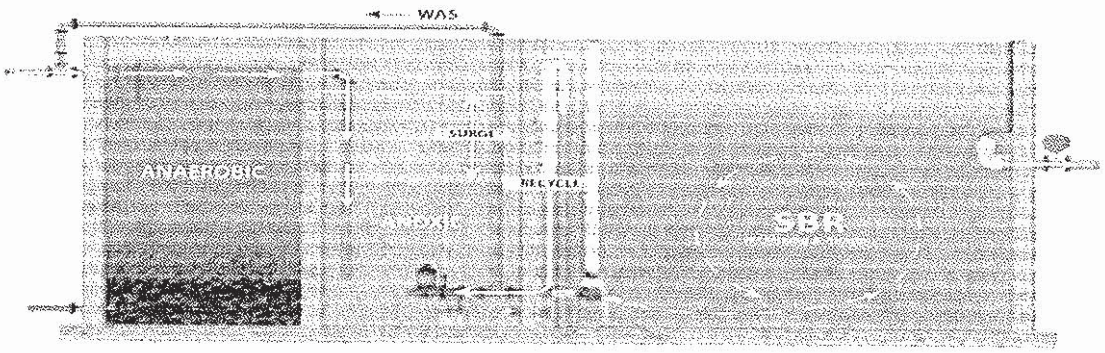
Secondary Biological Treatment

The secondary biological system shall be designed for the removal of BOD, TSS and Total Nitrogen (TN). There are many types of BNR processes; however, we believe that the Fluidyne ISAM (Integrated Surge Anoxic Mix) process would be well suited for this application. The ISAM process is comprised of an anaerobic pre-treatment / primary settling tank followed by an anoxic basin which is coupled to a Sequential Batch Reactor (SBR) basin to form a batch version of the well-known A^2O process. By coupling the SBR to the anoxic basin, the facility provides both front and back-end surge attenuation.

The ISAM process is capable of consistently producing effluent, prior to filtration, with the following concentrations:

BOD	< 10 mg/l
TSS	< 10 mg/l
Total Nitrogen	< 10 mg/l
Turbidity	< 5 NTU

Figure 1.0 - Typical ISAM Treatment Unit Process



When using a compact activated sludge process, the bio-solids production rate is much higher than typical lagoon systems, therefore processing and storage of the solids is required on a much more frequent basis. One of the major advantages of the ISAM process, beyond exceptional effluent quality, is that it "integrates" biological waste sludge management within the main process. Similar to the US Filter Cannibal process, the ISAM system biologically reduces waste sludge to basically inert solids volumes, reducing the total sludge production to less than 25% of a conventional activated sludge plant without the need for additional process equipment. This greatly reduces the frequency of sludge disposal and hauling costs.

Post SBR Decant Surge basin

From the SBR Tanks, effluent is decanted into a post-treatment surge basin. The surge basin provides back-end hydraulic attenuation of the high-rate decant flow reducing hydraulic load fluctuations on the filtration and disinfection process. Variable frequency driven filter feed pumps lift the water out of the surge basin and into the tertiary filter system. The surge basin will also be provided with a return line, allowing water in the basin to be delivered back to the front-end of the process for re-treatment of off-spec water.

Tertiary Filtration

To achieve California Title 22 unrestricted reuse water quality, the facility will incorporate filtration and disinfection. The filter system will consist of five identical 6-foot diameter vertical pressure sand filters. Each filter will provide 28.3 square-feet of filtration area for a total usable filter area of 113.1 square feet with one filter as a redundant unit. The filters will be constructed with a 60" sideshell to be used with multiple grades of filtration sand and anthracite with a minimum bed depth of 3.5 feet. The system will be pre-manufactured and skid-mounted with automatic backwash controls based on elapsed time and filter pressure differential. The design-loading rate for the filters will be 2.0 gallons per minute per square foot at the Maximum Month Day design flow rate and 3.9 gallons per minute per square foot at Maximum Day Flow conditions with one filter unit out of service. On-line turbidity monitoring will be provided up-

stream and down-stream of the filter system to monitor filtration performance and comply with California Title 22 requirements. In addition, automated polymer injection will be provided up-stream of the filter system to improve filtration performance under high solids loading conditions.

Disinfection After Filtration

From the filtration system, effluent will be disinfected using ultra-violet (UV) radiation from three low-pressure high-output UV disinfection modules installed in an open-channel configuration. The system will be designed to treat maximum day flow conditions (444 GPM) with one module out of service. Each UV module will consist of 40 – 300w UV lamps capable of providing a dose of 100 mJ/cm^2 at 65% transmittance at a flow rate up to 222 GPM (444 GPM for 2 modules).

Final Effluent

After residual UV disinfection, it is assumed that the final effluent will be discharged via gravity to the plant outfall. An effluent master plan has not been developed at this time, so effluent disposal options have not been solidified.

The effluent quality from the proposed WRF will meet California Title 22 requirements for unrestricted reuse. This high quality effluent may be used for irrigation of landscaping, open space irrigation, pond / water feature makeup water, and in the winter, water for snowmaking. By providing a "dual-plumbed" system for reuse, demand for potable water will be reduced, alleviating stresses on the local groundwater supply. Due to the small size of the facility, it is not practical to use effluent for wash or process water. Rather, potable water will be used for these purposes.

Sludge Storage

As previously discussed, the ISAM process integrates sludge management within the secondary process. This system biologically reduces the natural production and accumulation of bio-solids and provides internal thickening to a solids concentration of 4 to 5%. At the Design Maximum Month Day Flow, it is estimated that approximately 1,165 gallons of waste sludge will be required to be removed from the facility each day. Since it is a new development, solids requiring disposal will increase from approximately 50 gallons per day at 10% of the design flow to 1,165 gallons at maximum month daily flow (build out design).

Solids will be anaerobically digested in the anaerobic tank(s) until basin inventory necessitates removal. It is assumed that solids be removed, transported, and disposed of in a larger treatment facility as either stabilized bio-solids or as septage. Sludge removal will be performed by contracted pumper trucks. Removal interval is anticipated to be once every 87 days at low flow conditions and once every 3-4 days at full design flow. The initial facility will not include sludge dewatering equipment; however, space planning has allowed for the future installation of a centrifuge.

Plant Reliability Features

The facility as proposed meets the requirements of Title 22 Article 8 for redundancy and reliability. The facility will be provided with a Supervisory Control and Data Acquisition (SCADA) system for monitoring and alarming of all major plant equipment and performance. The SCADA system will be connected to a software auto-dial system to allow for 24-hour surveillance and alarm notification. In addition, the SCADA system will allow plant operators to dial-in and view real-time plant information and review historical data. The facility will be supplied with an automatic transfer switch and emergency power generator capable of full operation of the facility without load shedding.

Permits

Construction:

Based on our review of the permitting requirements for the construction of the facility, Final Plans, Specifications, Structural and Electrical calculations are required to be submitted to San Benito County Building and Planning Department. Upon receiving the building permits from the County, construction of the Facility can commence.

Reuse:

To allow for the application of treated effluent to land within the property, a Title 22 Engineering Report, Plans and Specifications will need to be submitted to the Central Coast Regional Water Quality Control Board (CCRWQCB), San Luis Obispo Office along with a Report of Waste Discharge. The report will require groundwater monitoring and effluent planning to be completed which will detail the location and proposed uses of the application area. From this report, the CCRWQCB will draft Waste Discharge Requirements (WDRs) which will be subject to a public comment period. If no significant comments are received by the board within the public comment period, a public hearing will not be required and the a permit will be issued. If a public hearing is required, the permit may be delayed substantially. In very few instances, the permit may not be granted.

Once WDRs have been issued, the Department of Heath Services will issue a Title 22 permit to Operate the facility.

The following are the minimum permit requirements for the Northeast Fairview WRF:

State of California

*Waste Discharge Requirements (WDRs) – RWQCB
*Title 22 Permit to Operate – Cal DHS
*National Pollutant Discharge Elimination System (NPDES) - RWQCB (only required if discharging to surface water)
*Storm Water Management Permit, Construction – RWQCB
*Storm Water Management Permit, Post-Construction – RWQCB

San Benito County
Building Permit – County Building and Planning Department
Grading Permit – County Building and Planning Department
Air Quality Permit – Air Quality Management District (AQMD)
Hazardous Materials – County Fire Marshall

In order to obtain effluent disposal permits listed herein, the following minimum documents are required to be prepared, depending on effluent disposal methods:

*Report of Waste Discharge – RWQCB
*Title 22 Engineering Report – RWQCB / Cal DHS
*Applications for WDR, Title 22 and NPDES

* Services for these permits and document preparation are not included, but may be requested under separate contract.

Utilities

Electrical Power Requirements:
Electrical power service in the form of 480 volt, 3-phase, 60 hertz, 800A will be required for the plant site. This includes all process equipment, lighting and ventilation systems for the treatment facility. An on-site generator with automatic transfer switch will be provided for emergency power in the event of a power failure.

Potable Water and Fire Flow
Potable water will be required for several connections in the WRF, including sinks and a lavatory, as well as for fire flow to one fire hydrant adjacent to the building. PERC has assumed that the facility will be required to comply with NFPA 820 – 2003 ed. as far as electrical classifications and fire protection requirements. This requires a minimum hydrant connection with a capacity of 1500 gpm for 2 hours. The local fire marshal's office may reduce or increase this requirement at their discretion. Hydrant protection shall be provided by the development for the treatment plant site.

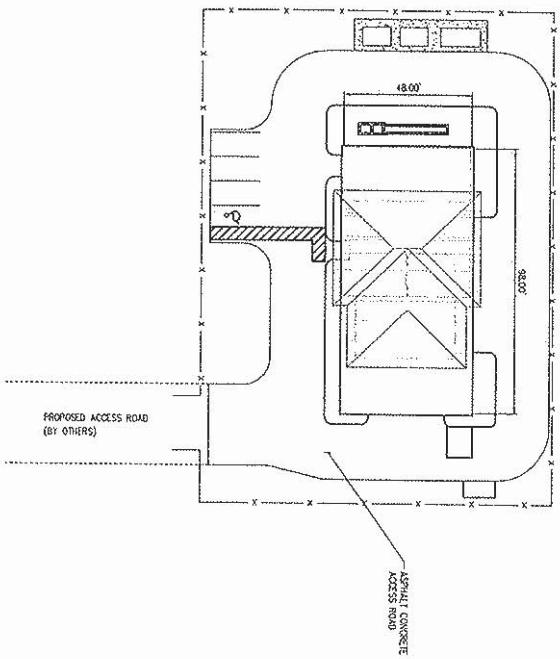
Communications Requirements:
The facility will require four lines of telephone communication. These will be used for voice, fax, data transfer and alarm auto-dialing. Optionally, PERC has found that a high-speed internet connection can provide exceptional value in operations. With high-speed internet, facilities can be monitored from any internet based web access point and data transfer and programming can be done remotely.

N.E. Fairview WRF Basis of Design and Unit Process Capacity Summary

	Northeast Fairview WRF
Design Flows	
Maximum Month Day Flow (GPD)	320,000
Maximum Day Flow (GPD)	640,000
Peak Hour Flow (GPD)	960,000
Influent Parameters	
BOD5 (mg/l)	350
TSS (mg/l)	350
TKN (mg/l)	40
Effluent Parameters	
BOD5 (mg/l)	<10
TSS (mg/l)	<10
TIN (mg/l)	<10
Turbidity (NTU)	< 2 Average / < 5 max
Coliform (total) (CFU/100ml)	<2.2 <23 single sample maximum
Influent Lift Station	
Length (feet)	9.9
Width (feet)	7.9
Area (ft2)	78.5
Maximum Liquid Depth (feet)	6
Minimum Liquid Depth (feet)	2
Average Working Volume (gallons)	2,350
Pumping Capacity w/largest Unit Out Of Service (GPM)	667
Pump #1 Capacity – 7.5 HP Flygt C-series	667 GPM (@ 35' TDH)
Pump #2 Capacity – 7.5 HP Flygt C-series	667 GPM (@ 35' TDH)
Secondary Biological Treatment	
Type of Treatment	ISAM / SBR
Number of Process Trains	2
Length (feet)	46.5
Width (feet)	22.5
Maximum Liquid Depth (feet)	20.0
Working Volume / Process Train (gallons)	156,500
Average Hydraulic Retention Time (Hours)	23.5
Decant Depth (feet)	4.4

	Northeast Fairview WRF
Decant Volume / cycle (gallons)	34,434
Decant Rate (GPM)	960
Design MLSS (mg/l)	3,000
Design SRT (days)	10.1
Sludge Waste Capacity (gpm)	100
Cycle Times (min) at Average Day Flow	
Fill	33
Interact	123
Settle	60
Decant	60
Idle	NA
Total Time Per Cycle	276
Number of Cycles / Day / Reactor	5.2
Aeration Systems	
Aeration Type	Jet
Number of Jet Nozzles per SBR Reactor	12
#O2 per hour per SBR Reactor (SOR)	98
Total Available Aeration Time per Day (hrs)	13.4
Design Aeration Time per Day (hrs)	10.0
Blower Capacity per basin (scfm)	500
Decant Surge Tank	
Length (feet)	46.5
Width (feet)	10.5
Max Liquid Depth (feet)	15.0
Minimum Liquid Depth (feet)	2.0
Working Surge Volume (gallons)	47,500
Number of Filter Feed Pumps	2
Capacity of Each Filter Feed Pump (GPM)	444 @ 90' TDH
Effluent Filtration System	
Filter Type	Pressure Vessel
Filter Media Type	Sand / Anthracite
Number of Units including redundant	5
Filtration Area per Filter Unit (SF)	28.3
Ave. Filtration Capacity @ 3 GPM / SF (all in service)	107
Peak Filtration Capacity @ 5 GPM / SF (one unit out of service)	142
Actual flow rate @ design flow 100,000 GPD (gpm / sf)	2.5
Backwash Flow Rate @ 15 gpm / sf (GPM)	424
UV Disinfection System	
Type	Low Pressure High Output

	Northeast Fairview WRF
Number of Modules	3
Number of Lamps per Module	40
Capacity per Module @ 100 mJ/cm2 & 65% Transmittance (gpm)	222
Rating of Lamp (kW)	0.165
Total Kilowatts Installed	19.8
Sludge Production and Disposal	
Sludge Storage Available Undigested (Days)	70
Estimated Sludge Reduction - %	50.0
Design Flow Digested Sludge Required for Disposal @ 4% (gallons)	885
Design Flow Inerts Accumulation @ 4% (gallons)	280
Low Flow Hauling Schedule @ 4,000 Gallons/Truck (days)	87
Design Flow Hauling Schedule @ 4,000 Gallons/Truck (days)	3-4



NORTHEAST FAIRVIEW
WATER RECLAMATION FACILITY

JOB NO. 13-0229 | SHEET 10

Pacific Environmental Resources Corp.

NORTHEAST FAIRVIEW
WATER RECLAMATION
FACILITY - 0.3 MGD

SITE LAYOUT

PACE
PACIFIC ADVANCED CIVIL ENGINEERING
17320 NEWHOPE STREET, SUITE 200
FOUNTAIN VALLEY, CA 92708
PH (714) 481-7300 FAX (714) 481-7299

PREPARED BY: JAMES MATTHEWS
PROJECT ENGINEER
R.C.E. NO. -------
EXP. XX/XX/XX
DRAWN: CLP
RECORD: ADD
CHECKED: JAM
SCALE: NONE
DATE: MAY 2008

NO	BY	REVISIONS	DATE	APP
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3				
4				
5				

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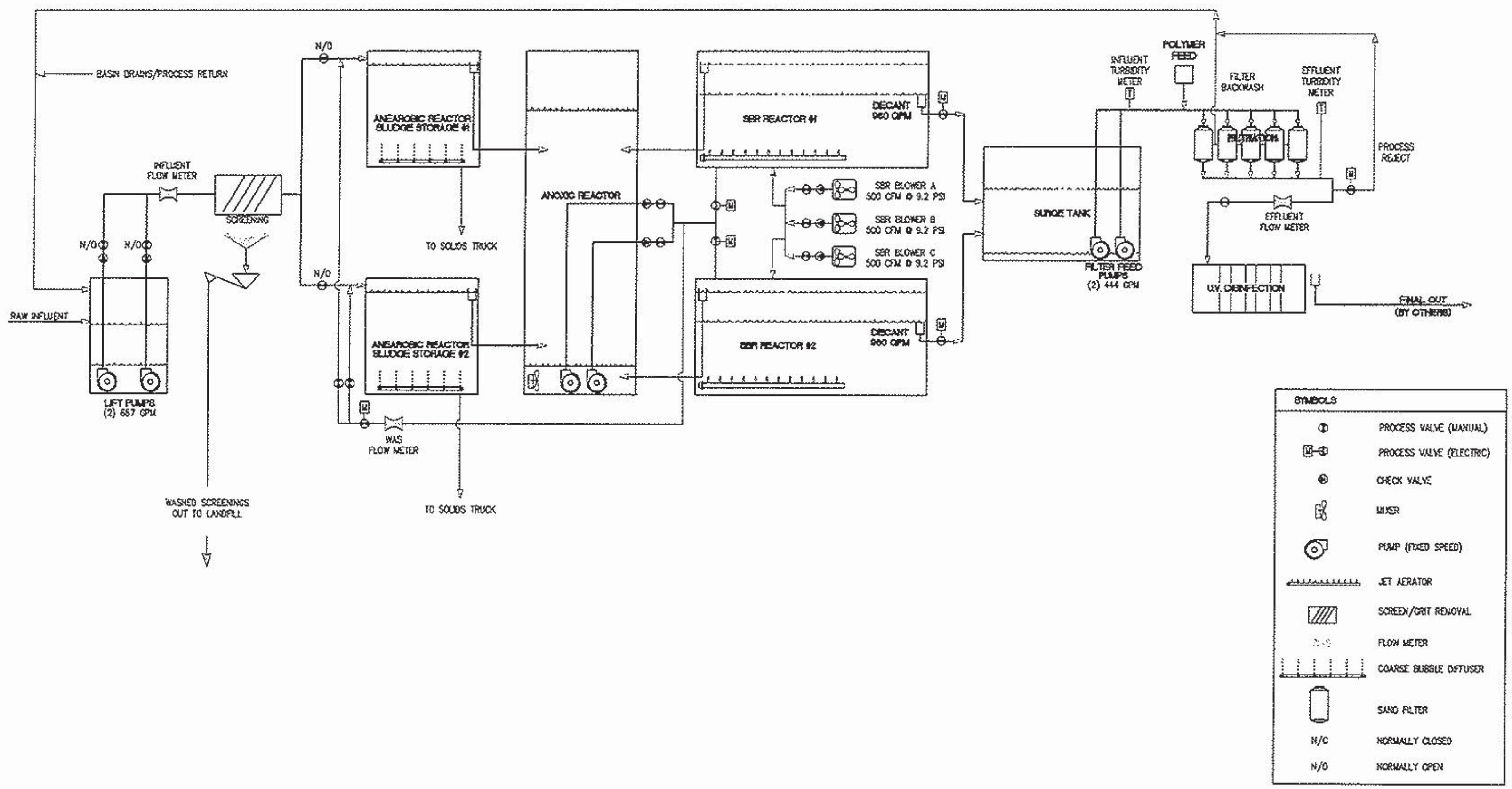

PREPARED BY JAMES MATTHEWS, PROJECT ENGINEER
EXP. XX/XX/XX
DRAWN CLP — SCALE NONE
DESIGNED MDO
CHECKED JKW — DATE MAY 2006

PACE
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17520 NEWHOPE STREET, SUITE 200
FOUNTAIN VALLEY, CA 92708
PH (714) 481-7300 FAX (714) 481-7299

NORTHEAST FAIRVIEW WATER RECLAMATION FACILITY - 0.3 MGD

PROCESS FLOW SCHEMATIC

PERC — Pacific Environmental Resources Corp.

SHEET 02

JOB NO. 8230-E

NO	BY	REVISIONS	DATE	APP

EQUIPMENT LIST

ITEM	PERC ID	NAME	MANUFACTURER	MODEL	DESCRIPTION	QTY
		HEADWORKS / SCREENING				
1	11-130	SCREEN	IPEC	IFU 3048	INTERNALLY - FED SCREEN, 0.08" OPENINGS 687 GPM, ½ HP, 480V/3/60	1
2	11-186	SCREEN CONVEYOR/COMPACTOR	IPEC	PSC 8100	8"CONVEYOR, 1 HP, 480V/3/60 SUPPLIED BY IPEC	1
		PUMPS & MIXERS				
11	11-210	INFLUENT PUMP	FLYGT	CP3127.090/439 MT	667 GPM @ 35' TDH, 7.5 HP 480V/3/60, 6"x6" 90' SWEPT DISCHARGE	2
12	11-250	SBR JET PUMP	FLYGT	NP3153.090/622 LT	2200 GPM @ 18' TDH, 15 HP 480V/3/60, 10" STRAIGHT DISCHARGE	2
13	11-265	FILTER FEED PUMP	GRUNDFOS	385S-150-2	444 GPM @ 90' TDH, 15 HP, 6" DIA. MOTOR VFD, 480V/3/60, 4" DISCHARGE	2
14	11-218	SBR FILL PUMP	FLYGT	NP3127.090/422 LT	1040 GPM @ 20' TDH, 7.5 HP, 480V/3/60, 6" STRAIGHT DISCHARGE	2
15	11-215	ANOXIC REACTOR MIXER	FLYGT	4630-8SJ	4650 GPM, 856 RPM, 2.5 HP, 14.3" DIA. PROPELLER WITH 8" PROPELLER ANGLE	1
16	11-260	LOW FLOW FLOATING DECANTER W/ PUMP	FLYGT	NS3085.092/462 MT	3' DIAMETER S.S. ASSEMBLY WITH PUMP 350 GPM @ 20' TDH, 3 HP, 460 V, 3Ф, 60 HZ	1
17	11-272	ANAEROBIC BASIN PUMP	FLYGT	DF3057.091/234 MT	80 GPM @ 25' TDH, 2.7 HP 480V/3/60, 2" x 2" 90' SWEPT DISCHARGE	2
		AERATION SYSTEM				
22		SBR AERATION MANIFOLD	FLUIDYNE	-	12 - 2" NOZZLE JET AERATION MANIFOLD 183 GPM/NOZ @ 17.5' TDH	2
23	11-350	DECANTER	FLUIDYNE	-	960 GPM GRAVITY FLOW 8" DIA. PIPE, 304 SS CONSTRUCTION	2
24	11-348	LOW FLOW AIR MANIFOLD	EDI USA BLUEBOOK	MAXAIR-24-0 STOCK #32201	316 STAINLESS STEEL COARSE BUBBLE DIFFUSER 5 TO 15 SCFM EACH	35
25	11-410	SBR BLOWERS	KAESER	DB235C	500 SCFM @ 9.2 PSI, 30 HP 480V/3/60, W/SOUND REDUCTION ENCLOSURE	3
26	11-418	LOW FLOW BLOWERS	SUTORBILT USA BLUEBOOK	3MP STOCK #48522	89 SCFM @ 9.0 PSI, 7.5 HP 480V/3/60, W/SOUND REDUCTION ENCLOSURE	2
		FILTRATION				
31		SAND FILTER	MIAMI FILTER	SKID MOUNTED	6' DIA. x 60" SIDEWALL STEEL TANK 5 GPM/SF W/CONTROL PANEL, 120V/1	5
32	11-680	POLYMER FEED UNIT	DYNABLEND	L4-300-2.50-13-1	300 GPH DILUTION WATER 0.01 - 2.5 GPH POLYMER FEED, 120V/1	1
		DISINFECTION				
33	11-710	UV DISINFECTION	IDI	AQUARAY 40-HO VLS	LOW PRESSURE, HIGH OUTPUT VERTICAL LAMP 40 LAMPS, 230VAC	3
		ODOR CONTROL				
41	11-515	ODOR CONTROL UNIT	CALGON	HF3000	3000 CFM WATER REGEN ACTIVATE CARBON 15 HP FAN	1
		MISCELLANEOUS				
53		PRESSURE-RELIEF/SUSTAINING VALVE	BERMAD	730	6", Y-PATTERN ANSI 125/150 LB FLAT DISC, MAINTAIN A MINIMUM OF 25 PSI UPSTREAM PRESSURE	1
54		PRE CAST LIFT STATION	UTILITY VAULT	-	7'-11" X 9'-11" INSIDE DIMENSION	1

EQUIPMENT LIST (CONT.)

ITEM	PERC ID	NAME	MANUFACTURER	MODEL	DESCRIPTION	QTY
		INSTRUMENTS/METERS				
71	17-630	INFLUENT FLOW METER	TOSHIBA	LF434-KACBCCAAB	6" MAG FLOW METER W/ COMBINED FLOW ANALYZER, 120VAC	1
72	17-630	EFFLUENT FLOW METER	TOSHIBA	LF434-KACBCCAAB	6" MAG FLOW METER W/ COMBINED FLOW ANALYZER, 120VAC	1
73	17-630	WAS FLOW METER	TOSHIBA	LF434-HACBCCAAB	3" MAG FLOW METER W/ COMBINED FLOW ANALYZER, 120VAC	1
74	17-650	TURBIDITY METER	HF SCIENTIFIC	MICRO TOL	NEPHELOMETRIC METHOD, 120VAC RANGES 0-10 AND 10-100 NTU	2
75	17-700	DISSOLVED OXYGEN SENSOR	INSITE IG	MODEL 10 SENSOR	FLUORESCENT DISSOLVED O_2 PROBE	3
76	17-700	DO ANALYZER	INSITE IG	MODEL 2000	DUAL CHANNEL ANALYZER, 120VAC	2
77	17-750	LIQUID LEVEL PRESSURE TRANSDUCER	E+H	WATER PILOT FMX 167	0-10 PSI 4-20 mA OUTPUT, 24VDC	9
78	17-900	COMBUSTIBLE GAS DETECTOR	ATI	C12-17	3-CONDUCTOR CABLE WIRED DIRECTLY TO PLC FOR POWER AND SIGNAL, 24VDC, NO DISPLAY	1
80		LIFT STATION CONTROL PANEL	MPE	SC2000	STAND ALONE PUMP STATION CONTROLLER W/ MODBUS INTERFACE TO SCADA SYSTEM CONTRACTOR TO PROVIDE UL 508 CONTROL PANEL IN A NEMA 4X S.S. ENCLOSURE	1

DESIGN PARAMETERS

PARAMETERS	VALUE
DESIGN FLOW	0.32 MGD
DESIGN BOD	350 mg/L
DESIGN TKN	40 mg/L

NOTE: WALL THICKNESS IS 18 INCHES (5000 PSI)
FOUNDATION THICKNESS IS 20 INCHES

NO	BY	REVISIONS	DATE	APP

PREPARED BY
JAMES MATTHEWS
PROJECT ENGINEER
R.C.E. NO. --------
EXP. XX/XX/XX
DRAWN CLP
SCALE NONE
DESIGNED MDO
CHECKED JAH
DATE MAY 2006

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PH (714) 481-7300 FAX (714) 481-7299

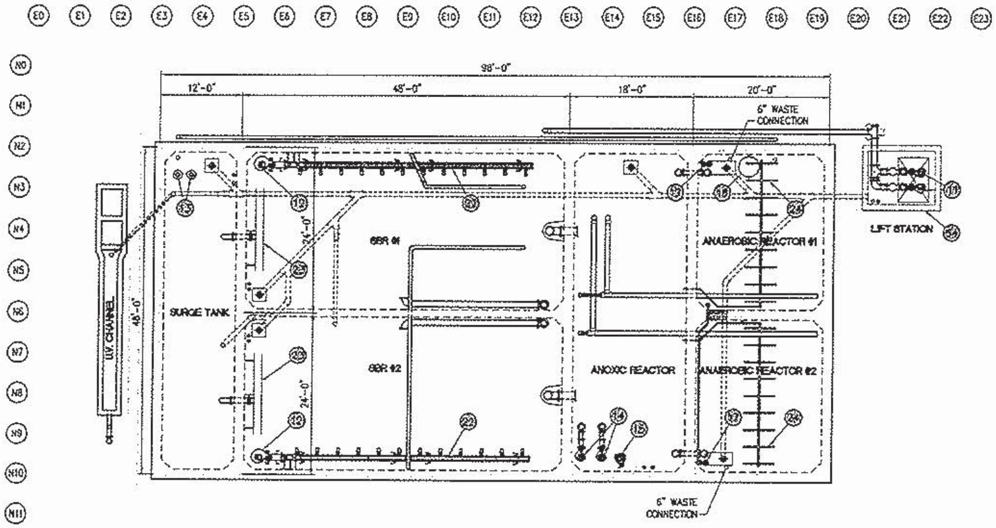
NORTHEAST FAIRVIEW
WATER RECLAMATION
FACILITY - 0.3 MGD

EQUIPMENT LIST

PERC
Pacific Environmental Resources Corp.

SHEET 03

JOB NO. 8230-E



MECHANICAL BELOW
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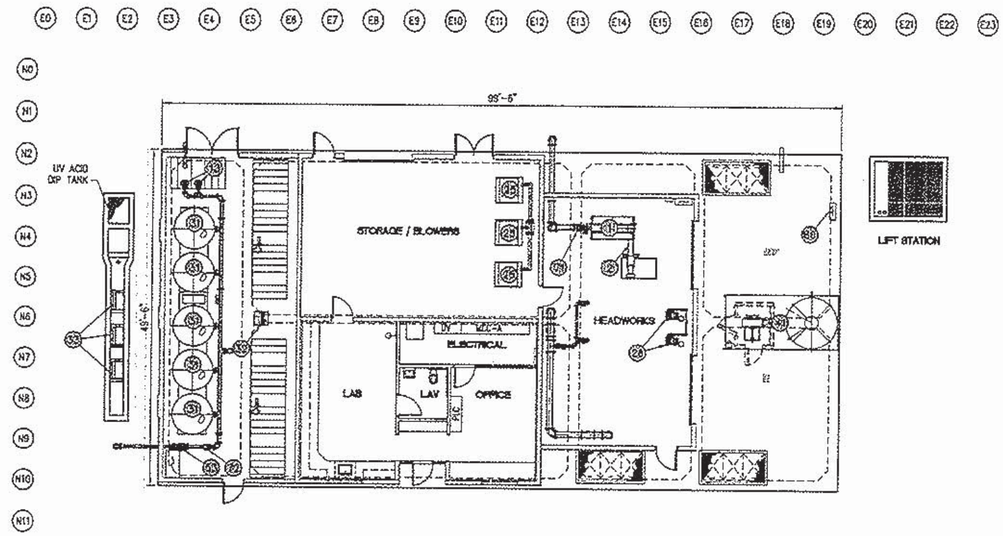

MECHANICAL ABOVE
SCALE 1/8" = 1'-0"

JOB NO.	8230-E
SHEET	04

Pacific Environmental Resources Corp.

NORTHEAST FAIRVIEW WATER RECLAMATION FACILITY - 0.3 MGD

MECHANICAL PLAN ABOVE & BELOW

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PREPARED BY JAMES MATTHEWS, PROJECT ENGINEER
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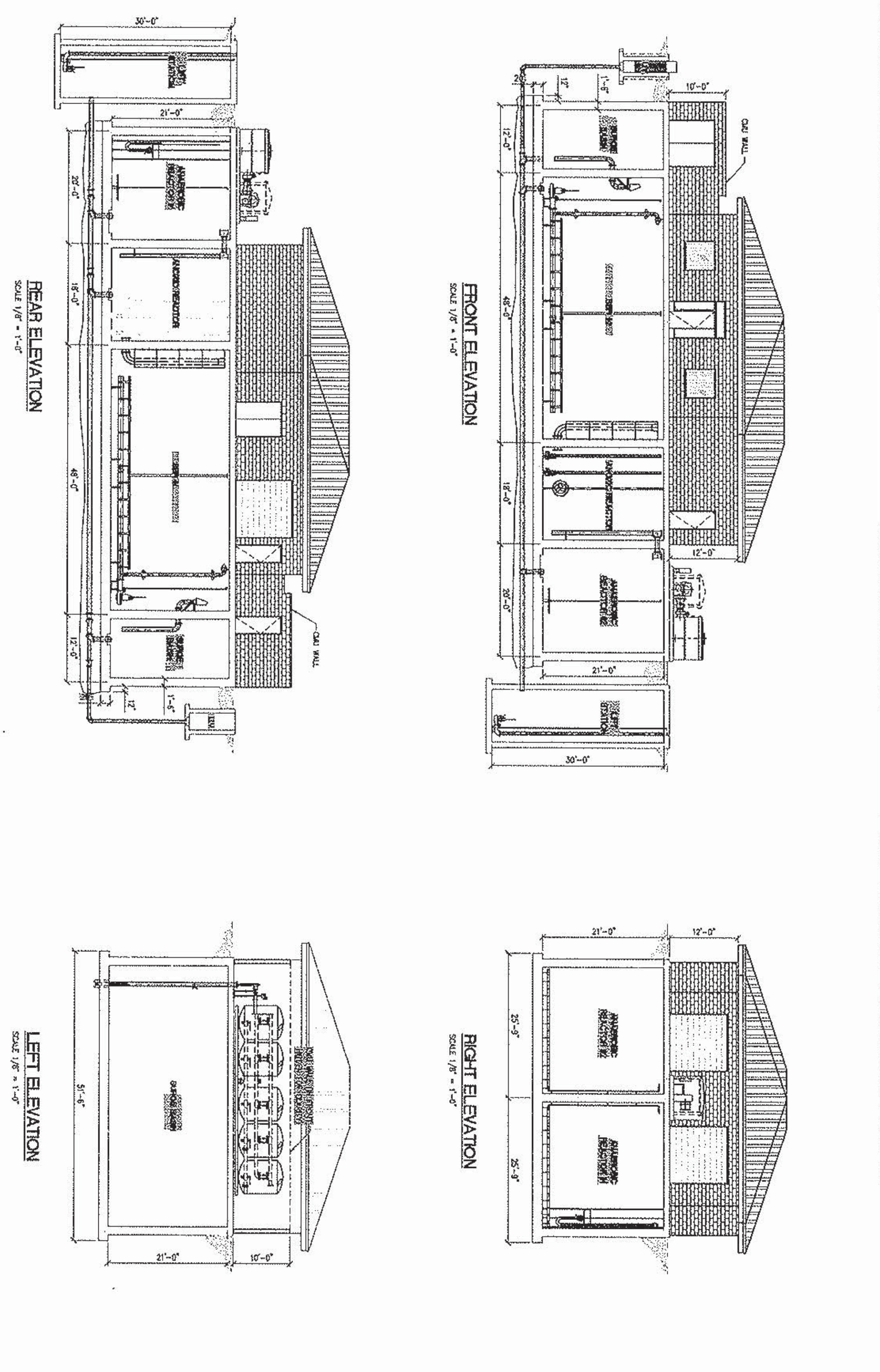
NO	BY	REVISIONS	DATE	APP



SHEET 05	Pacific Environmental Resource Corp.	NORTHEAST FAIRVIEW WATER RECLAMATION FACILITY - 0.3 MGD	PACE PACIFIC ADVANCED CIVIL ENGINEERING 17520 NEWHOPE STREET, SUITE 200 FOUNTAIN VALLEY, CA 92708 PH (714) 481-7300 FAX (714) 481-7299	PREPARED BY JAMES MATTHEWS PROJECT ENGINEER
JOB NO. 8230-E		BUILDING ELEVATIONS / SECTIONS		R.C.E. NO. ------- EXP. XX/XX/XX
				DRAWN CLP SCALE NONE
				DESIGNED MDO
				CHECKED JAM DATE MAY 2006

NO	BY	REVISIONS	DATE	APP

N.E. Fairview WRF

The schedule for the design/build project is comprised of engineering, permitting, construction and facility startup. Assuming a commencement date for Final Design of February 4, 2007, and assuming all milestone periods are met, PERC anticipates achieving Substantial Completion (as defined herein) on August 1, 2008.

Design and Engineering

Final Design and Engineering (Construction Shop Drawings) shall be submitted to the Developer within 180 calendar days from the date PERC receives a written Notice to Proceed from the Developer for PERC to commences the Final Design and Engineering.

PERC anticipates a 60 calendar day review period by the Developer and County of the Final Design and Engineering submittal.

PERC anticipates a 90 calendar day review period by regulatory agencies to issue permits for the commencement of construction.

Construction

Construction shall commence upon a written Notice to Proceed issued by the Developer, all applicable permits have been issued necessary for the construction of the WRF, and approval of all Final Design Plans have been issued by the Developer ("Commencement of Construction") anticipated to be May 6, 2007.

PERC shall achieve Substantial Completion of the WRF within 450 calendar days from the Commencement of Construction. Substantial Completion shall be the date when the WRF has been completed in accordance with the contract documents and has completed the 24-hour clean water test as required prior to the startup of the WRF and a letter of Substantial Completion has been issued by the Engineer of Record which shall include a detailed punch list of outstanding items. At Substantial Completion, PERC anticipates the WRF will be ready to accept wastewater for the purpose of Vault and Haul operations.

Startup

Commencement of Startup will require the WRF has sufficient wastewater flow and BOD load and available seed sludge to commence startup of the Facility.