Appendix H

Drainage and Wastewater Analysis

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Drainage and Wastewater Analysis - Santa Margarita Ranch Agricultural Cluster Subdivision and Future Development Program EIR

The following summarizes our analysis of potential impacts to drainage and water quality:

1. Environmental Setting

The environmental setting for the Agricultural Residential Cluster Subdivision site is summarized below:

Topography: Elevations within the Agricultural Residential Cluster Subdivision site vary from approximately 1,000 feet mean sea level (ft MSL) to approximately 1,300 ft MSL. Slopes are approximately 2.5:1 in 15 to 20% of the area proposed for house lots.

Soils: According to the Preliminary Soils Investigation for Tract 2586 (Buena Geotechnical Services, October 23, 2003), site soils underneath the proposed residential development are generally clay over silts and sands. Groundwater was not detected to a depth of 15 feet below existing grade. Percolation test results were performed by Buena Geotechnical Services at depths of 5 to 7 feet and varied from 15 to 60 minutes per inch (min/in), with an average percolation rate of 33 min./in. A total of 26 borings were performed around the property to determine whether septic tank and leachfield disposal systems were appropriate for this development. The study was a general characterization of site suitability for leachfields, and borings were not collected in sufficient quantities to indicate whether each lot had an appropriate area for a septic tank and leachfield. The study indicated that on-site soils generally provide sufficient percolation for leachfields. However, San Luis Obispo County typically requires a minimum of 3 percolation tests per leachfield, an exploratory boring to 10 feet below the drainfield bottom, and a site plan prior to approving a leachfield for construction. A minimum of 336 borings (for 112 residences) would be required to confirm whether each lot has an acceptable leachfield site.

Drainage: The Agricultural Residential Cluster Subdivision site drains to four (4) Waters of the US: Trout Creek (northeast of Agricultural Residential Cluster Subdivision site); unnamed tributary to Trout Creek (passes through the Agricultural Residential Cluster

Subdivision site); Yerba Buena Creek (southwest of the Agricultural Residential Cluster Subdivision site); and Rinconada Creek (southeast of the Agricultural Residential Cluster Subdivision site). Each of these watercourses eventually flows to the Salinas River.

Various reports have documented drainage issues in the Santa Margarita area. These reports, and drainage concerns which may be affected by the proposed Agricultural Residential Cluster Subdivision, are summarized in Table 1.

Regulatory Floodplain: 100-year flood zones have been identified by FEMA along creeks within the Agricultural Residential Cluster Subdivision site as shown on the attached Drainage Constraints Map. Floodplain delineation is based on the National Flood Insurance Program Flood Boundary and Floodway Map for Community 060304 (July 5, 1982, FEMA). The 100-year flood zone is defined as the "regulatory floodplain" by FEMA. County Ordinance Section 22.104.020.D. states the following about the relevance of the floodplain to development within the Salinas River Area:

> "Within the Salinas River floodplain as defined by the flood hazard combining designation shown on the official maps in both rural and urban areas, discretionary permits and land divisions shall protect the habitats and resource integrity of the floodplain. Development shall be designed and located to protect the river as a water resource and to maintain the natural features and habitats within the floodplain."

2. Discussions with Regulatory Agencies

Boyle staff coordinated with Regional Water Quality Control Board and County Environmental Health Staff regarding the Agricultural Residential Cluster Subdivision and the Future Development Program. These agencies enforce state, federal, and local water quality requirements and administer permitting programs. These discussions are summarized in Table 2.

Table 1 - Summary of Drainage Reports/Studies

Report Name	Year	Firm or Agency	Study Area	Boundaries of Area Studied	Objectives	Findings
Santa Margarita Ranch Environmental Constraints Analysis	Mar1994	Envicom Corporation	Santa Margarita Ranch	Four watershed tributaries to the Salinas River (1) Santa Margarita Creek (2) Yerba Buena Creek (3) Trout Creek (4) Rinconada Creek	Identifies constraints to future development on the Santa Margarita Ranch	❑ Future development is not expected to expand the boundaries of the 100-year floodplain, however, it would increase the frequency of local flooding.
Preliminary Drainage Report for Santa Margarita Ranch	Revised Mar 29, 2004	EDA	20 Residential development approximately 7,500 sf. each	~~South of Highway 58 and east of Encina Ave~~ **The portion of the development located within the Yerba Buena Creek watershed (not all watersheds within the project's boundary)**	Design report for drainage improvements within Agricultural Residential Cluster Subdivision	❑ Santa Margarita Ranch would cause no increase in peak storm flow to Yerba Buena Creek watershed & very minor change in town of Santa Margarita. To mitigate any increase in flow due to the increased impervious area from new construction, a detention basin will be developed as part of the project.
Flood Control and Drainage Investigation of the Santa Margarita Ranch and Surrounding Area	Jul 1, 1987	Schaaf & Wheeler	Santa Margarita Ranch & surrounding area	Rinconada Creek, Santa Margarita Creek, Trout Creek and Yerba Buena Creek and surrounding flood prone areas	Calculates peak discharge for the 2-, 10-, 50- and 100-year floods for Rinconada, Santa Margarita, Trout & Yerba Buena Creeks for the Santa Margarita Ranch Company (on & off site conditions). The report also evaluates existing capacity of the channels and road crossings and delineates the flood prone areas.	❑ Yerba Buena Creek is the most constraining to future development of the Ranch. Flooding & capacity is less than 10 year flood in town. Upstream of Encina Ave the capacity is between 25- to 50-year flood. ❑ Rinconada Creek – If development occurs within this watershed, the existing drainage facilities would be undersized and would not meet the County's criteria for secondary waterways. ❑ Santa Margarita Creek – In the area downstream of Hwy 101 but upstream of the confluence with Yerba Buena Creek, the channel capacity is equivalent to a ten year storm. The reach from the Yerba Buena Creek confluence to the confluence with the Salinas River has a capacity slightly less than the 50-year flood. Channel and bank erosion could be potential problems in the lower reach of this creek. ❑ Trout Creek – The channel and culvert system at the quarry road have capacities less than the 2-year flood. The channel and bridge at Highway 58 has a capacity close to the 100-year flood.
Santa Margarita Drainage & Flood Control Study	Feb 2004	San Luis Obispo County Public Works Department, the Community of Santa Margarita, Raines, Melton & Carella, Inc, Questa Engineering Corporation and Essex Environmental	Santa Margarita Ranch	Santa Margarita Ranch	Summarizes existing drainage problems in the community. Recommends solutions to the drainage problems Identifies environmental permitting requirements Provides planning level cost estimates Outlines a plan for funding and implementation of the proposed solutions	❑ Areas experiencing recurring flooding problems include: 1. West end of H St, approximately 200 feet south of the box culvert crossing at the railroad. Two homes repeatedly have reported property damage. 2. Corner of Wilhelmina Ave and I St. Four homes reported property damage. 3. Houses at corner of K St and Maria Ave. repeatedly have reported property damage. Areas experiencing recurring flooding problems include: ❑ Proposed Capital Improvement Projects - Yerba Buena Creek Improvements (Total costs for the five proposed projects was $6.2 million) 1. Two off-channel detention basins in parallel 2. Vegetation management 3. Levee along south side of town 4. Storm drain diversion to north of town 5. Improvements to existing drainage system

Table 2. Drainage and Wastewater Consultation	
Contact and Title	Comments
Tom Kukol Water Resources Engineer Regional Water Quality Control Board Phone Conversation May 23, 2006	1. RWQCB is concerned about future development potential within Santa Margarita area and potential impact on groundwater quality. 2. RWQCB may recommend that the community and/or developers look into a Wastewater Management District to manage septic tank maintenance activities. 3. Septage production and disposal will be a concern. The City of Santa Maria Wastewater Treatment Facility is reaching its capacity to receive septage and County septage generators are running out of options for disposal.
Barry Tolle County Environmental Health Specialist Phone Conversation June 6, 2006	1. Groundwater has been encountered within 5 feet of ground surface in areas of Santa Margarita. The (existing/new) systems are experiencing poor percolation rates. The systems must fit on the lot and have a 5' minimum separation between groundwater levels & leachfields. 2. County Environmental Health is working on developing special design requirements for septic systems in the Santa Margarita area. In particular, the County is working with RWQCB to develop engineering requirements for mound systems (as an alternate to conventional leachfield systems) and to develop an approach for reviewing mound system plans.

2. Environmental Impacts

A. Impact Analysis: Improvements related to the Agricultural Residential Cluster Subdivision, such as vegetation removal, grading, excavation or fill, will result in soil erosion, topographic changes, loss of topsoil or unstable soil conditions.

In order to estimate the impact on sediment load of converting portions of the site from agricultural use to residential use, the Universal Soil Loss Equation was applied. The calculations are attached. According to these estimates, the proposed Agricultural Residential Cluster Subdivision would reduce erosion from the site from approximately

1.04 tons/ac-yr to 1.02 tons/ac-yr. As discussed below, the increased runoff from the site is not considered significant and is therefore not expected to result in a significant increase in off-site sediment transport.

However, as shown on the Agricultural Residential Cluster Subdivision site map, the Agricultural Residential Cluster Subdivision will require placement of culverts and will require rerouting existing "sheet-type" or "shallow concentrated" flows to ditches and pipes. Redirecting sheet or shallow concentrated flows to ditches and culverts will result in erosion and sediment transport to downstream areas if erosion control or outlet protection measures are not provided.

This impact is considered less than significant with mitigation.

B. Impact Analysis: Implementation of the Agricultural Residential Cluster Subdivision will change rates of soils ~~adsorption~~ **absorption**, and the amount and direction of surface runoff.

Construction of the Agricultural Residential Cluster Subdivision will result in an increase in impervious area within the property. According to the Preliminary Drainage Report by Engineering Development Associates (March, 2004), each lot will have an impervious area of approximately 7,500 sf for homes and 1,200 sf for driveways. Impervious area for roadways and driveways is approximately 10 acres (ac), estimated by review of the Agricultural Residential Cluster Subdivision site map. Therefore, the total impervious area for 112 homes and subdivision roads/driveways is expected to increase from present conditions by 29 acres.

An increase in impervious area will reduce the soil absorption of rainfall, resulting in an increase in runoff and a minor net decrease in groundwater recharge **at a particular location** if the runoff is permanently rerouted or detained. The report by EDA proposes a detention structure which would reduce the 50-year post-development storm event to a 2-year pre-development condition for the portion of the site draining to Yerba Buena Creek. In the EDA analysis, storm duration was varied from 10 to 600 minutes (10 hours) and the maximum volume calculated for this range of durations was selected. The following issues are potentially significant impacts, but can be mitigated:

- Runoff to Yerba Buena Creek may overflow the proposed detention structure during a 100-year storm event, since the basin is designed to handle a 50-year storm event. Therefore, the post-development runoff during a 100-year storm event would exceed the pre-development event and would increase downstream flooding.
- Runoff volume to Trout Creek and Rinconada Creek may significantly increase during all storm events since no detention storage is proposed for portions of the Agricultural Residential Cluster Subdivision site within these watersheds. This would increase downstream flooding.

In addition to the review of the EDA report, Boyle performed a hydrologic analysis of affected watersheds to assess the impact of the proposed Agricultural Residential

Cluster Subdivision on downstream conditions at a more "regional" level. Rinconada Creek was not included in this analysis since it has not been the subject of prior drainage concerns. Impacts on the Rinconada watershed are expected to be negligible, since the proposed impervious areas are outside its watershed. This analysis was performed to provide a relative comparison of peak flows under existing and post-development conditions at the following locations:

- Yerba Buena Creek at railroad culvert crossing;
- Unnamed tributary to Trout Creek at 1-Mile Bridge (Highway 58); and
- Trout Creek at 1-Mile Bridge (Highway 58).

These locations were selected for analysis because they are immediately upstream of substantial problem areas within the Santa Margarita Community. The most substantial historic flood damage has occurred along the south boundary of the existing community where these creeks enter the community. Boyle developed hydrologic models of these watersheds using the Santa Barbara Unit Hydrograph with the Natural Resource Conservation Service Type I Rainfall Distribution. National Oceanic and Atmospheric Administration rainfall frequency maps for 24-hour storms were used for rainfall data. The 2-, 10-, 25-, 50-, and 100-year storm events were evaluated. The following table summarizes the results for the pre-development and post-development conditions (assuming no detention storage is provided).

Table 3. Hydrologic Model Results for Pre-development and Post-development Conditions without Detention

Watershed	Return Period (yrs)	Predev. Q (cfs)	Postdev. Q (cfs)
WS1 - Yerba Buena Creek (4.5 sq. mi.)	2	334	334
	10	778	778
	25	1040	1040
	50	1082	1082
	100	1402	1402
WS2 - Unnamed Trib. To Trout Creek (1.1 sq. mi.)	2	45	47
	10	103	107
	25	138	142
	50	144	148
	100	188	192
WS3 - Trout Creek (8.8 sq. mi.)	2	1322	1322
	10	3491	3491
	25	4781	4781
	50	4986	4986
	100	6564	6564

The Preliminary Drainage Report by EDA (March, 2004) includes detention storage for lots draining to Yerba Buena Creek but not the Trout Creek Watershed. In the EDA

report, the storage requirement was calculated based on the Modified Rational Method, assuming reduction of a 50-year post-development storm event to a 2-year pre-developed condition over a range of times of concentration (10 to 600 minutes). This is consistent with the County's detention requirements for private developments. The EDA report yielded a storage requirement of 0.90 AF for the developed area draining to Yerba Buena Creek. As proposed, Agricultural Residential Cluster Subdivision impacts to the Yerba Buena Creek and Trout Creek Watersheds are negligible according to this analysis, with the proposed installation of detention facilities in accordance with the County's detention storage standards.

However, impacts to the unnamed tributary to Trout Creek Watershed are expected to be significant and were not addressed in the Preliminary Drainage Report by EDA. **Trout Creek affects areas downstream of the community of Santa Margarita.** Unless detention storage is provided in the unnamed tributary to Trout Creek Watershed, the proposed Agricultural Residential Cluster Subdivision would increase flooding along Trout Creek ~~at the southern limits of the existing Santa Margarita Community~~ **downstream of the community of Santa Margarita** during a 100-year storm event. Since a substantial portion of the Santa Margarita community is within the 100-year floodplain, the proposed Agricultural Residential Cluster Subdivision would result in a significant impact related to off-site flooding.

C. Impact Analysis: Implementation of the Agricultural Residential Cluster Subdivision will change the drainage patterns (such as relocation of drainageways during construction), resulting in substantial on- or off-site sedimentation/erosion or flooding.

Drainage patterns to Trout Creek, Rinconada Creek, and Yerba Buena Creek are not expected to change significantly as a result of the Agricultural Residential Cluster Subdivision. However, as a result of the increased impervious area (as discussed above), peak flow rates may increase to the creeks and to areas which have historically had drainage problems in Santa Margarita (as discussed in the previous section).

D. Impact Analysis: Involve activities within the 100-year flood zone

The Agricultural Residential Cluster Subdivision, as proposed, does not involve activities within the 100-year flood zone as shown on the Constraints Map. However, impacts on the downstream drainage system are expected as discussed in the prior section.

E. Impact Analysis: Violate waste discharge requirements, Central Coast Basin Plan criteria for wastewater systems, or water quality standards

As proposed, the Agricultural Residential Cluster Subdivision does not violate waste discharge requirements or Central Coast Basin Plan criteria for wastewater systems. However, the generalized percolation test, borings, and leachfield siting study performed by the applicant thus far are not sufficient for assessing the capacity of each individual leachfield. In addition, plans have not been submitted which show an acceptable location (appropriate setbacks, slope, and siting) for each leachfield. County criteria for

borings and percolation tests must be applied to each proposed leachfield site for each lot. This would be considered a significant but mitigable impact.

F. Impact Analysis: Change the quality of surface or ground water (e.g. nitrogen-loading, daylighting);

Background Water Quality: According to the Ground Water Supply Impacts Study (Cleath, 2000), the available water supply for the Agricultural Residential Cluster Subdivision consists of ground water stored within the Santa Margarita formation. Two test wells were drilled (440 and 500 feet depth, respectively) and produce 15 and 35 gpm. For the purpose of the wastewater analysis, it is assumed this water quality is representative of the water quality which will be delivered to all water customers with the Cluster. All water quality constituents for the two wells were within California Department of Health and Safety (CDHS) drinking water standards (See Table 4). Hardness was measured at 150 and 290 mg/L for Wells 1 and 2, respectively. Selenium was measured as 6 ug/L in Well 1 but was not detected in Well 2.

Wastewater Quality Objectives: No specific basin plan objectives have been established for this particular groundwater basin. The following table summarizes the anticipated quality of percolated wastewater and provides a comparison to background water quality, and CDHS Maximum Contaminant Levels.

Table 4: Anticipated Quality of Percolated Wastewater

Constituent (mg/L)	Santa Margarita Ranch Water Quality from Test Wells (Cleath, 2000)		Anticipated Quality of Percolated Wastewater	Maximum Water Quality Goals for Agricultural/Landscaping Usage[1]	CDHS MCL (mg/L)
	Well #1	Well #2			
TDS	310	410	610-710	450-2000	1000
Cl	38	46	108-116	100	500
SO^4	29	26	71-74	--	500
Na	64	36	116-144	70	Not Regulated
Total Nitrogen[2] (Nitrate + Nitrite)	0.2	0.2	69-76 (RAW) 48-53[3]	5-30	45

[1] See Appendix for references. Water Quality Goals for landscaping/irrigation represent the acceptable ranges of concentrations for growing and maintaining landscape and typical area agricultural products. California Department of Health Services standards are regulatory limits for potable water.

[2] Water Quality (Wells 1 and 2) – Nitrogen = Nitrate + Nitrite; Percolated Wastewater

[3] Assuming 10% removal in septic tank, 20% removal in leachfield

As shown, the proposed Agricultural Residential Cluster Subdivision would result in a net increase of salts and nitrogen in percolated effluent from the leachfields. The nitrogen concentration of percolated effluent is expected to exceed the MCLs for drinking water, whereas the other parameters listed above will not.

Water Softeners: The use of self-regenerating water softeners can contribute an additional 200-300 mg/L of TDS to wastewater through brine discharge. If offsite-regenerated water softeners are used, the additional TDS load can be significantly reduced to less than 100 mg/L.

Soils: Potential for "daylighting" (or emergence of effluent to the ground surface) cannot be assessed until site plans and multiple percolation tests are provided for each leachfield, as discussed above. Daylighting of percolated wastewater is not expected as long as the County's and Regional Water Quality Control Board's leachfield and septic tank design criteria are followed.

G. Impact Analysis: Runoff from the Agricultural Residential Cluster Subdivision will discharge into surface waters and otherwise alter surface water quality (e.g., turbidity, temperature, dissolved oxygen, etc.).

Nutrients, salinity, and TDS – Approximately 1,100 acres of the planned 3,778-acre Agricultural Residential Cluster Subdivision are currently used for cattle grazing. Converting the land from agricultural use to residential use will increase the amount of fertilizers (including salinity and TDS) applied to the property for residential landscaping. However, removing cattle from these areas will result in a decrease of pathogens (such as coliform bacteria) contributed to surface waters from these areas. In addition, cattle manure contributes nutrients to runoff. Impacts would be considered significant but mitigable, as long as the Best Management Practices (BMPs) presented in the County's Storm Water Management Plan (which are required for new developments) are employed to reduce nutrients (and indirectly reduce salinity and TDS) below threshold levels.

Metals and hydrocarbons – The presence of vehicles and pavement will likely result in an increase in hydrocarbon and metal transport from the site. The impact is considered significant but is mitigable, as long as the County's Best Management Practices for new development are applied (as discussed above).

H. Impact Analysis: Implementation of the Agricultural Residential Cluster Subdivision will result in septage load that cannot be managed by local facilities.

According to the Survey of Septage, Treatment, Handling, and Disposal Practices in California (California Wastewater Training and Research Center at CSU-Chico, 2002), the amount of gallons received by septage receiving facilities in California was 167 million gallons per year (MGY) in 2002. Capacity of Calfornia septage receiving facilities was 217 MGY. Assuming each 1200-gallon septic tank is pumped once every 5 years, we estimate a volume of 27,000 gallons/year will be hauled from the proposed Agricultural Residential Cluster Subdivision.

However, according to this report, the Santa Maria Wastewater Treatment Facility, which is the closest septage receiving station to the proposed Agricultural Residential Cluster Subdivision, is at capacity. An expansion of the treatment facility is currently in process. In the meantime, septage loads would need to be hauled to other facilities. The hauling and disposal of septage is controlled by numerous State and federal regulations. Compliance with these regulations would ensure less than significant impacts.

5. Mitigation Measures

Mitigation Measure ARCS1: Install Best Management Practices (BMP) to prevent metals and/or hydrocarbons from entering each of the creeks from the proposed development

Mitigation Implementation / Monitoring

1) Performance Standard: Design and install Best Management Practices (BMPs) such as storm drain filters to reduce hydrocarbon and/or sediment-bound metals.
2) Implementation Responsibility: County Public Works Department for final development plan and construction.
3) Implementation Schedule: Final plan development and prior to and during construction.
4) Monitoring Method: BMPs shall be field verified by the County for compliance.

Impact Significance After Implementation of Mitigation Measure: Implementation of storm water BMPs will reduce potential impacts to a less than significant level.

Mitigation Measure ARCS2: Provide for an on-site private drainage system to convey storm flows to off-site drainage facilities. The drainage system shall be designed to comply with the County criteria (reduction of the 50-year postdevelopment flow to 2-year predevelopment conditions). Detention facilities within the unnamed tributary to Trout Creek Watershed shall also have capacity to reduce the 24-hour 100-year post-development runoff to 100-year pre-development conditions, at a minimum.

Mitigation Implementation / Monitoring

1) Implementation Responsibility: The applicant shall provide a drainage plan and report showing the location and design of the storm drain and detention systems. The Plan shall be submitted to Planning Department for review and approval. Installation shall be ensured through a bond or performance security provided by the applicant.
2) Implementation Schedule: The on-site drainage system shall be installed prior to clearance for occupancy. An entity, comprised of homeowners, shall be formed to maintain storm drain systems for the life of the Agricultural Residential Cluster Subdivision. This entity shall also determine and specify long-term maintenance requirements.

3) Monitoring Method: Public Works shall inspect site for installation of drainage system. Public Works review is required on final grading/drainage plans, and Planning Department review is required for release of the performance security.

Impact Significance After Implementation of Mitigation Measure: Implementation of the on-site drainage system will prevent erosion, reduce off-site drainage concerns, and reduce potential water quality impacts to a less than significant level.

Mitigation Measure ARCS3: The project applicant shall develop and maintain a monitoring program for receiving groundwater and shall provide a Septic Tank Maintenance Plan.

Mitigation Implementation / Monitoring

1) Implementation Responsibility: The applicant shall prepare a Septic Tank Maintenance Plan including minimum tank cleaning frequency of once every two years as well as proposed groundwater monitoring locations (upgradient and downgradient of the proposed Agricultural Residential Cluster Subdivision) and recommended frequency of collection/analysis. Applicant shall install groundwater monitoring wells, which will be located and developed by a qualified hydrogeologist. At a minimum, three groundwater monitoring wells will be located upgradient of the ARCS and three will be located downgradient. Plan shall be submitted to Planning and Public Works Departments for review and approval. Groundwater monitoring results shall be submitted to Public Works Department for review. At a minimum, groundwater samples shall be taken on an annual basis and will include an analysis of TDS, chlorides, nitrate, nitrite, total nitrogen, ammonia, sodium, and sulfate by a certified laboratory. Sampling and analysis costs will be paid by the applicant. Installation of monitoring wells shall be ensured through a bond or performance security provided by the applicant. If a statistically significant increase is observed in any of the above parameters, the applicant will be responsible for developing a Wastewater Collection, Treatment, and Disposal Master Plan as outlined below (see Mitigation Measures for the FDP). The constituents of concern and threshold limits shall be determined by the county.
2) Implementation Schedule: Monitoring wells shall be installed prior to clearance for occupancy. Following the Septic Tank Maintenance Plan shall be the responsibility of an entity comprised of ARCS homeowners for the life of the Agricultural Residential Cluster Subdivision. This entity shall specify long-term septic tank maintenance and groundwater monitoring requirements.
3) Monitoring Method: Public Works shall inspect site for installation of monitoring wells. Public Works review is required on monitoring well installation, and Planning Department review is required for release of the performance security. Public Works staff shall review regular groundwater monitoring reports (as specified in the Plan) and determine whether a Wastewater Collection, Treatment and Disposal Master Plan is required.

Impact Significance After Implementation of Mitigation Measure: Implementation will reduce water quality impacts to a less than significant level.

Mitigation Measure ARCS4: On-site regeneration of water softeners shall be prohibited.

Mitigation Implementation / Monitoring

1) Implementation Responsibility: Agricultural Residential Cluster Subdivision residents shall be prohibited from installing water softeners which require on-site regeneration or are self-regenerating. Off-site regenerated water softeners will be allowed if they are regenerated outside the Agricultural Residential Cluster Subdivision site.
2) Monitoring Method: County inspector shall inspect site for installation of self-regenerating water softeners prior to occupancy of the structures.

Impact Significance After Implementation of Mitigation Measure: Implementation will reduce water quality impact to a less than significant level.

Mitigation Measure ARCS5: Develop and submit septic tank and leachfield site plans for each proposed lot, as well as percolation tests and borings in accordance with County leachfield design/construction requirements. The project applicant shall demonstrate sufficient leachfield percolation for each proposed residential unit and lot, in accordance with County standards.

Mitigation Implementation / Monitoring

1) Implementation Responsibility: The applicant shall submit (at a minimum) septic tank and leachfield site plans, 3 percolation tests, and exploratory boring or excavation (in accordance with County building permit requirements) for each proposed residential lot in order to indicate each lot has a suitable location for the proposed systems.
2) Implementation Schedule: Submittal will be provided to County Planning Department with Development Permit Application.
3) Monitoring Method: County Environmental Health and Building Department staff will review plans prior to issuing Development Permit.

6. Future Development Program

At this time, insufficient project-level information is available to precisely assess quantitative impacts of the Future Development Program (FDP) on drainage or water quality. However, the following impacts would apply at a program level.

Impact FDP1 – Off-site Flooding and Drainage Concerns: Impacts downstream and within the Future Development Program area could be significant but are mitigable. Impacts will depend on location of future projects relative to the floodplain and existing drainage problems, as well as the impervious area and changes in drainage patterns associated with the projects.

The FDP includes construction of a Community Drainage Facility which is intended to mitigate potential impacts. The location of the facility will be determined with the submittal of

a Specific Plan for the first subdivision within the FDP. Objectives of this facility will include mitigation of potential impacts on downstream problem areas, as identified in the previous studies cited above and based on additional input from County staff. This facility would help address some downstream flooding problems, but may not address all potential flooding impacts from FDP components. Since the size, location, and design of the contemplated community drainage basin have not been defined, the future facility may be inadequate to address drainage and flooding hazards associated with FDP implementation.

Impact FDP2 – Water Quality:

Wastewater - Impacts to groundwater and surface water quality (concentration of salts, nitrogen, solids, and organics) from future development on the property (commercial, residential, recreational, and winery processing facilities) may be significant for the Future Development Program. The Future Development Program includes wineries, golf courses, and typical domestic wastewater generators such as homes, restaurants, and businesses.

Wineries: The impact of wineries on ground water quality is considered significant without mitigation. Source mineral quality will dictate wastewater quality, since most wastewater will result from washdown activities. Winery wastewater will consist of fermentation waste products (including tannins, lignins, volatile acids, and yeasts), cleaning chemicals (caustic sodas and disinfectants), and raw source water constituents. Wastewater is usually devoid of nutrients (nitrogen and phosphorus) other than those present in the source water or those incidentally added through cleaning chemicals. Organic strength of different waste components can vary from 0 mg/L (BOD5, or 5-day biological oxygen demand) for some washdown activities to approximately 220,000 mg/L for lees (waste products from fermentation). 5000 mg/L BOD5 is a typical design parameter for daily or monthly averaged concentrations for winery wastewater treatment processes.

Domestic Wastewater: If not mitigated, the impact of future wastewater disposal from domestic users on groundwater quality would be significant. The wastewater quality (contaminant concentrations) of domestic discharges would be similar to that presented in Table 4, assuming septic systems or another form of land application are used for disposal. However, mass loading to groundwater would increase in proportion to the number of domestic users. The State Water Resources Control Board prohibits the use of septic systems and leachfields in “urbanizing areas” (see Appendix) since high densities of leachfield systems can exceed the assimilative capacity of receiving groundwaters.

Drainage – After construction of any proposed FDS elements or projects, vehicles and pavement will likely result in an increase in hydrocarbons and metals in runoff from the site. The impact is considered significant but mitigable.

In particular, runoff from the golf course could result in significant impacts to water quality if not mitigated. Golf course runoff can include elevated levels of nitrates, phosphorus, and total dissolved solids (TDS) as a result of fertilizer, pesticide, and herbicide application.

6.2 Mitigation Measures

The following mitigation measures, which would be directed by the County and paid for by the developer, are recommended. Work plans for these studies should be presented to County Public Works for approval prior to commencement.

Mitigation Measure FDP1: Develop a Community Drainage Master Plan prior to any future development projects within the FDP area following implementation of the Agricultural Residential Cluster Subdivision. The Master Plan will address potential improvements (including size and location of local and regional stormwater facilities) to address water quality, flooding potential, and erosion control throughout the community. The Plan will present a phased implementation strategy to address project-by-project impacts as the FDP is implemented. Mitigation will include implementation of the drainage basins, channels, or other improvements recommended in the Plan, in accordance with County standards.

Mitigation Measure FDP2: Perform a characterization of existing groundwater and estimate of assimilative capacity of groundwater underneath the Future Development Program development areas. Characterization would be required prior to any future development projects within the FDS area following implementation of the Agricultural Residential Cluster Subdivision.

Mitigation Measure FDP3: Develop a Community Wastewater Collection, Treatment, and Disposal Facility Master Plan for the area, after the groundwater characterization study is completed. The Plan will address alternative sites for treatment facilities, process alternatives, and disposal/reuse options for buildout of the property as well as provisions to serve the existing Santa Margarita Community. The Plan will present a phased implementation strategy to address project-by-project impacts as the FDP is implemented. Objectives will be developed by the County and Regional Water Quality Control Board prior to acceptance or approval of the Work Plan. Mitigation will include implementation of a regional or decentralized wastewater treatment system.

Boyle Engineering Corporation

Michael K. Nunley, P.E.
Branch Manager

Attachments: References
Soil Loss Calculations

Boyle Engineering Corporation

BY: EL DATE: 4-12-06 SUBJECT Santa Margarita Ranch JOB NO: R17-100-01
CHKD. BY: DATE: ARC Development Site

Soil Loss Calculations

To calculate the soil loss/sedimentation caused by the Santa Margarita Ranch ARC development, the Universal Soil Loss Equation is used. Water Quality Prevention, Identification, and Management of Diffuse Pollution
Authors: Vladimir Novotny / Harvey Olem
Publisher: Van Norstrand Reinhold, NY 1994

A = R x K x LS x C x P (pg. 254, eq. 5.2)
where,

A = calculated average annual soil loss in tonnes/ha

R = rainfall intensity factor	R = 112	figure 5.11 (50 multiplied by 2.24 for metric)
K = soil erodibility factor	K = 0.24	SCS map info. at back of Paso Robles Area book
LS = slope length factor	LS = 7	equation 5.6

C = cropping management (vegetative cover) factor
0.01 undeveloped 0.008 developed
P = erosion control practice factor
0.25 undeveloped pg. 263 alternate meadows on 2-7% slope

0.5 developed pg. 264 normal rate of usage of erosion control measures

The watershed was gridded to have 53 intersecting points, each point was given a corresponding C-value, as referenced from Table 5.4

Undeveloped: annual average soil loss
A = 112 x 0.26 x 56 x 0.01 x 0.25
= 0.47 tonnes/ha
= 1.04 ton/ac-yr

Developed: annual average soil loss
A = 112 x 0.26 x 56 x 0.01 x 0.5
= 0.46 tonnes/ha
= 1.02 ton/ac-yr

Assumes areas for pavement, building pad, landscaping, average construction pollution prevention
Assumes 70% natural state & 30% developed

A 2% decrease in soil loss from ARC area following development

References

1. "Draft Technical Memorandum for Santa Margarita, SLO County, CA," Questa Engineering Corp., May 19, 2003.

2. "Flood Control and Drainage Investigation of the Santa Margarita Ranch and Surrounding Area," Schaaf & Wheeler, July 1, 1987.

3. "Preliminary Drainage Report for Santa Margarita Ranch," EDA, Revised March 29, 2004.

4. "Santa Margarita Drainage & Flood Control Study," a collaborative effort between the San Luis Obispo County Public Works Department, the Community of Santa Margarita, Raines, Melton & Carella, Inc, Questa Engineering Corporation and Essex Environmental, 2003.

5. "Santa Margarita Ranch Environmental Constraints Analysis," Envicom Corporation, date unknown.

6. "Winery Utilities Planning, Design and Operation," David R. Storm, 1997.

7. Ayers, Robert S., Quality of Water for Irrigation, Journal of the Irrigation and Drainage Division, ASCE, June 1977. (Table 1, page 136)

8. Irrigation with Reclaimed Municipal Wastewater – A Guidance Manual, California State Water Resources Control Board, Report Number 84-1 wr, July 1984. (Table 3-4, page 3-1)