Technical Memorandum Name: **Decentralized Treatment, January 2008**
Commenter: **K. Wimer**
Comments Date: **February 14, 2008**
Responses Date: **September 25, 2008**

The following comments were submitted in response to the above listed Technical Memorandum (TM). The TM was developed as part of the EIR process for the project, in order to help facilitate and broaden the discussion of project issues important to the community. The responses should be considered preliminary because the EIR process is not complete, and the information necessary to fully respond has not yet been developed. The project team is grateful to those citizens who took the time to review the TM and provide comments at this early stage in the process. The project team will endeavor to fully address the comments and concerns through the on-going project development process.

	Comment	Response
1	Page 2-3-2.1 Treatment—The TM indicates that plant trimmings, etc., will have to be removed from the each home site (if some nitrogen removal from reuse water is accomplished through plant uptake). It also states that subsurface irrigation may be needed, and suggests that the Nitrex systems may not be appropriate for Los Osos because they have not been used in systems as large as Los Osos'. Questions:	The draft Decentralized TM presented the overall concepts and issues associated with decentralized wastewater collection and treatment in Los Osos and addressed the conceptual descriptions submitted by Pio Lombardo in a letter dated June 8, 2007. Due to the uncertainty of the conceptual description, and public comments submitted in response to the draft TM, Pio Lombardo of Lombardo Associates, Inc (LAI) was retained to further develop a conceptual decentralized plan for the development of a Final TM. The LAI conceptual plan for decentralized treatment includes 7 separate collection zones and treatment plant sites. Detailed cost estimates for this decentralized plan are presented in the Final Decentralized Treatment Tech Memo and appendices.
2	1) Since Los Osos has Green Waste service, shouldn't the TM assume plant materials leave the site?	Individual landscape practices cannot be relied on to reduce nitrogen contamination. It is expected that any wastewater system developed for Los Osos which discharges within the Prohibition Zone will be required by the Regional Board to meet the 7 mg/L total nitrogen standard.
3	2) Because the nitrogen in the reuse water removes the need for nitrogen fertilizers, shouldn't reuse water be considered to contribute no net nitrogen increase? (Surely, the water board isn't going to regulate fertilizer use.)	See Above. Individual landscape practices cannot be relied on to reduce nitrogen contamination. It is expected that any discharges within the Prohibition Zone will be required by the Regional Board to meet the 7 mg/L total nitrogen standard.
4	3) Since the Nitrex system, with UV and Ozone treatment (as proposed later in the TM), raises water quality to Title	The LAI conceptual plan and cost estimates in the Final Decentralized

	22 standards (see LAI project in Malibu), why would subsurface irrigation be needed?	Treatment Tech Memo and appendices includes options for residential reuse/irrigation by sub-surface drip lines and options for sub-surface disposal. (Note: the LAI project in Malibu also uses sub-surface disposal)
5	4) Why is it necessary to find a Nitrex treatment system that serves a town the size of Los Osos when cluster systems (i.e., one cluster at a time) is being treated? Comment: The standards the water board plans to set for the water quality of on-site systems should be determined a.s.a.p . On-site systems are considered a viable alternative for wastewater treatment and can treat water to standards very near the standards of centralized treatment. Interestingly, the SWRCB website urges use of low-impact-development (LID) and on-site treatment solutions. Although the website applies (LID) mainly to storm water run off, the reasons for using LID (reduced energy, reduced infrastructure costs, and increased effectiveness of natural solutions and processes) also apply to on-site wastewater systems. Asano and Tchobanoglous, in Water Reuse (2006), point out on-site systems have become a viable alternative to centralized systems, in large part due the effectiveness of soil filtration systems over centralized treatment:" Centralized facilities would need to be equipped with advanced treatment processes to produce a quality effluent that is comparable to the high level of treatment that occurs naturally in the soil. The use of effluent from a DWM (Decentralized Wastewater Management) system for irrigation fulfills the goals of agricultural and landscape irrigation and high quality treatment in the soil for water that percolates out of the root zone" (Page 770). Therefore, to require highly treated water for reuse/disposal on-site appears to use energy and resources unnecessarily. The Project Team should ask the water board directly for the specific standards it will apply to on-site systems—and lobby the water board as necessary to enable this viable option to be considered.	On-site systems have some issues that are similar to decentralized and some issues that are unique to individual properties. On-site systems have been evaluated in a separate tech memo. The reuse of treated effluent for residential reuse will have specific water quality requirements for each situation. For on-site, centralized or **de-**centralized systems in Los Osos, residential reuse would likely require Title 22 compliance for unrestricted reuse and a 7 mg/L total nitrogen standard.
6	Page 4-2.1 Treatment (2.1.2 Septic Tanks)—The TM indicates that oxidation and a source of organic material is needed for STEP effluent to be treated. Questions:	
7	1) Why isn't the LAI pretreatment system (see LAI website), or a similar one, assumed to be part of the treatment process?	Section 2 is addressing the general issues associated with decentralized treatment. The tech memo goes on, in Section 4.2.2, to discuss the Nitrex treatment process proposed by LAI.
8	2) Why isn't a system such as the Ocean Arks "restorer" or "living machine," which nitrifies and denitrifies STEP/STEG effluent, considered?	There are a number of treatment processes which may be applicable to decentralized treatment. This tech memo, in Section 4, addressed the specific conceptual plan that had been submitted by Pio Lombardo in a letter dated June 8, 2007.
9	Page 4-2.2 Operational Issues—The TM indicates that backup power is needed for a Nitrex system serving	

	STEP/STEG clusters. Questions:	
10	1) If Nitrex systems are passive systems relying on gravity, why is back up power needed?	Based on the LAI conceptual plan for decentralized treatment which includes 7 separate collection zones and treatment plant sites, each site would treat approximately 150,000 gpd. A certain amount of pumping and process controls would require electrical power. Backup power would be necessary to ensure water quality and prevent spills during a power outage.
11	2) Why is back up power needed if a STEP/STEG collection system will stop sending effluent to a decentralized treatment facility when the power goes out? (Note that a sealed STEP/STEG system is not likely to allow enough I/I into the system to cause an overflow at the treatment facility—unlike a gravity system, which likely requires continued treatment plant operation during power outages due to continued flow and 1/1.)	A large portion of the LAI conceptual plan for decentralized treatment includes STEG collection, which would continue to deliver wastewater to the treatment facilities during a power outage.
12	Page 4&5-2.3 Community Issues/Environmental Issues—The TM occasionally mentions that the "hydraulics" of a STEP system might add to costs. Questions: Considering that the Fine Screening assumed a STEP/STEG system to be 100% STEG (i.e., every unit with a pump), why does the TM consider that the hydraulics of a STEP/STEG system might add to costs. (Note: With STEG units added to the system (up to 70% of the system), the hydraulic requirements should only go down)?	The Fine Screening Report assumed 100% STEP, (ie. with pumps), for a centralized system, but the hydraulics of the system may require a lift station or booster pumps to convey wastewater to an out-of-town location. The LAI conceptual plan for decentralized treatment includes a large amount of STEG collection and 5 or 6 pump stations. Detailed cost estimates for this decentralized plan are presented in the Final Decentralized Treatment Tech Memo and appendices.
13	Page 5-11-2.3 Community Issues/Environmental Issues 2.4 Costs, 3.1 Residential Reuse/Disposal, 3.3 Siting, Figure 2-A-2C, 3.4 Community Impacts, 3.5 Regulatory Concerns—In these sections, the TM suggests several potential problems with implementing a decentralized system (e.g., neighbor concerns, costs, delays, and regulations). Comment: All of these concerns can be minimized or eliminated by installing fewer treatment sites on larger parcels (within the URL), including sites which have been disturbed, e.g., Tri-W, the ETO property, and the large parcels near South Bay. Using Tri-W and other disturbed sites reduces ESHA concerns, while the Broderson site can be used (as planned previously) to offset any disturbance to the sites. An underground Nitrex treatment facility at Tri-W and other sites would encounter much less opposition than the MBR-type facility originally planned at Tri-W (in part, because of less solids hauling)—while an Ocean Arks "living machine" ("restorer') with a retention pond/wetlands would likely generate public support.	In the daft TM, approximately 30 sites were estimated to be required if they were to be located on individual vacant lots in the community. The LAI conceptual plan for decentralized treatment includes 7 separate collection zones and treatment plants on sites ranging from one to several acres. Further analysis of the community and siting issues will take place in the context of the project's Environmental Impact Report (EIR). Should decentralized systems prove to have the potential to meet the project objectives while complying with the requirements of the applicable environmental and land use statutes, then members of the EIR team, including licensed engineers well qualified to assess all aspects of wastewater treatment systems with

		respect to the various requirements of California law will undertake more detailed review of decentralized systems.
14	Page 7-3.2 Seawater Intrusion—The TM suggests that, even with 930 acre feet of water saved per year by a decentralized option, some sea-water intrusion would occur. Question:	
15	1) If the lower aquifer is being over drafted at a rate of 460-550 AFY, why would overdraft continue? Comment: I believe the TM may assume overdraft will continue because of purveyor pumping patterns, but stopping the overdraft of the lower aquifer is a top priority for the community, so purveyor patterns must change if companies/utilities are causing overdraft despite ample water supply to stop it.	The mitigation of sea water intrusion depends on the location and type of disposal or reuse, as well as, purveyor pumping patterns. Refer to the Effluent Reuse and Disposal Technical Memo for a detailed discussion of sea water mitigation factors.
16	Page 11-3.5 Regulatory Concerns—The TM suggests that the Broderson site may be more viable for recharge than on-site leach fields because it has been studied extensively. Comment: Considerable disagreement among experts exists about the effectiveness of Broderson and the dangers of the site, e.g., water surfacing, etc. Septic leach fields are proven to recharge the ground water in the area.	Extensive scientific study and prototype testing by experts in the fields of geology, hydrogeology, engineering, and environmental science from many different agencies and consulting firms over the last 20 years has consistently supported the conclusion that the Broderson site has the capacity for high rate infiltration. In contrast, the existing conditions, with septic tank leach fields, have been proven unsustainable, as shown by the existing sea water intrusion problem. Dispersed recharge to the upper aquifer is not an efficient way to provide recharge to the lower aquifer and much of the water is lost to outflow to Morro Bay.
17	Page 12-3.6 Costs—The TM states that the costs of the STEP system have already been estimated in the Fine Screening and it assumes a decentralized system will be equal in cost to STEP. Also it assumes the on-lot costs for the reuse/disposals systems will be $2-5/ sq. ft., and it reiterates the potential problems of neighbor opposition, property acquisition costs, and regulatory delays. Ouestions:	Detailed cost estimates for the LAI decentralized plan are presented in the Final Decentralized Treatment Tech Memo and appendices.
18	1) What is the source of the $2-5/sq.ft. cost for a subsurface drip system?	Costs are based on engineering estimates and similar case examples.
19	2) Why doesn't the estimate for the on-site reuse/disposal system show a low estimate of $0 since the system may not be needed (e.g., if Title 22 water is provided and/or existing leach fields are used)?	Residential reuse would require systems to be installed that are specifically design to irrigate plants. Existing leachfields would not provide any reuse benefit.
20	3) How is the water cost savings for the homeowner reflected (i.e., the homeowner will need to purchase only 1/2 of the typical amount (e.g., through reduced rates and charges)?	Cost savings would depend on the irrigation practices of each individual homeowner.
21	Comment for #8 above: Fair cost comparisons using STEP/STEG estimates from the Fine Screening are not	A large portion of the LAI conceptual plan for decentralized treatment

	possible without an estimated number of STEP vs. STEG units. In the Tri¬W project, STEG (gravity) units constituted about 70% of the collection system, and logically the number of STEP (pump) units should not greatly exceed the number of grinder pumps estimated for the former project (200) since those pumps were to be used at low-lying sites, which required pumps to move the waste uphill to collection pipes (i.e., the same purpose as STEP pumps). A STEP/STEG system with 70% fewer pumping stations would greatly reduce the construction and O&M costs for the system.	includes STEG collection. Detailed cost estimates for this decentralized plan are presented in the Final Decentralized Treatment Tech Memo and appendices.
22	Pages 13&15-4.1 General Issues— The TM asks for the specific project configuration, references, and evidence of regulatory compliance at "..a similar level of detail as that provided in the Fine Screening Report." Questions:	
23	When will the Project Team provide the same level of detail for the VPAs? Here are some of the questions that the Fine Screening did not answer about the VPA's in the report, but which need to be answered for a meaningful EIR and community survey:	
24	1) Will the water board approve a conventional gravity system for Los Osos, or require a special maintenance program, given that I/I, SSO's, and ocean pollution are becoming much greater concerns recently?	The Regional Board issues Waste Discharge Requirements. They may have provisions related to the collection system, but there is no basis for assuming that the Regional Board would not approve a gravity collection system.
25	2) How much will a completely sealed gravity system cost? (Note: The Fine Screening indicated that only a 100% sealed gravity system provided the same environmental protection as a STEP/STEG system.)	Gravity collection system estimates are provided in the Fine Screening Report. The previously designed system included standards for elastomeric seals at each pipe joint and water-stops and grouting at each manhole connection. There are currently no additional measures required. The potential impacts of leaks and spills for gravity and STEP/STEG collection systems are being evaluated for the draft EIR. If required, the EIR will identify additional mitigation measures to address these impacts.
26	3) How much of the combined gravity-low-pressure collection system (mentioned as the likely option in the Fine Screening) would be a low pressure system (i.e., how many grinder pumps would there be)?	The previously designed system required approximately 200 grinder pumps on individual lots to pump to the gravity collector pipe, but does not have low pressure zones.
27	4) How many STEG units (vs. STEP units) will be required in a STEP/STEG system and how much will that lower the costs, including energy costs?	The Fine Screening Report assumed 100% STEP to transport the sewage to an out-of-town treatment site, based on the Ripley Pacific conceptual plan. Design-build proposals for the collection system may include STEG units, if feasible.
28	5) What is the cost of STEP/STEG cluster systems, which have 2-10 homes per tank? 6) What is the cost of placing	STEP/STEG cluster tanks that serve multiple homes are not likely feasible

	STEP/STEG tanks in easements (e.g., to facilitate STEP/STEG clusters)? These questions must be answered, in order for the public and decision-makers to make informed decisions.	do to siting and waste management issues. Placing tanks in the road right-of-way would add the cost of an upgrade to a load bearing tank.
29	Pages 15&16-4.2-Specific Issues—The TM asks questions about the nitrifying process of the LAI Nitrex system and expresses concerns about the production of green house gasses from the system. Question:	
30	How will methane gases be handled with a gravity or gravity, low-pressure system? Comment: The pretreatment system which adds organic compounds to the effluent is explained on the LAI website. Note that consideration of methane emissions from a gravity system via the treatment process and openings in the system (e.g., manhole covers) was not discussed in the Fine Screening, although methane production is highest in the sources of wastewater highest in organic compounds. Therefore, how gravity wastewater is handled, especially at the treatment facility, is an important consideration.	Methane gases are produced by anaerobic process, such as a septic tank. Significant methane gas production is not expected for any of the treatment processes considered or with a gravity collection system. More details and analysis is provided in the Greenhouse Gas Emission Inventory Tech Memo.