Technical Memorandum Name: **Flow and Loads, March 2008**
Commenter: **Keith Wimer**
Comments Date: **March 14, 2008**
Responses Date: **July 7, 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	Dear LOWWP Project Team, Michael Brandman Associates, and TAC In general, the *Load and Flow TM* continues to confirm that a conventional gravity (bell and spigot) pipe collection system is not a viable alternative for Los Osos and that any gravity collection system must be completely sealed to be viable. Here are some of the reasons:	
2	The peak hourly wet weather flow (PHWWF) for the LOWWP in the TM is estimated to be 2.5 mgd or 180% the average daily wet weather flow (ADWWF). The ADWWF is the basis for system design capacity (collection system and most of the treatment facility). When a system exceeds capacity to this extent, overflows are likely to occur, especially when peaks are sudden (i.e., they surcharge the system). The EPA and SWRCB recognize I/I as a leading cause of SSOs (sanitary sewer overflows), and SSOs as a leading cause of beach closures and contamination of surface waters. Please note the list of storm-related events that occurred in the Central Valley over one New Year's holiday weekend in 2005/2006 (www.waterboards.ca.gov/rwqcb5/board-info/exec_officer_reports/0601eo.pdf. Note that all of these 32 events were due to overwhelmed conventional gravity systems. Note also that this is a partial list; the executive officer says "the list is growing," and realize that virtually all global warming scenarios predict that storm events will become more extreme.	Increases in flow in the collection system during wet weather are expected with any wastewater system. Provisions for additional storage and preventative maintenance of the collection system are important to minimize risks of overflow.
3	Carollo Engineers cites three studies to support the water tightness of conventional gravity pipes over time on Page 6. However, a search of the internet reveals that two of them were done by representatives of pipe companies. Alferink works in Marketing and Technology for Wavin Plastics, "Europe's Leading Supplier of Plastic Pipe Systems," according to its website., while Whittle works for Iplex Pipelines of New Zealand. (I couldn't locate the third resource by Bauer).	Review of the methodology and assumptions in the references studies can give an indication of their accuracy. Regardless of the conclusion of these studies, this tech memo takes a more conservative approach and assigns a level of I/I to the collection systems that is consistent with a variety of sources.
4	Regarding the TM's STEP/STEG analysis, the TM assumes that a STEP/STEG system should have a peak flow factor of 1.4 with a	The average daily wet weather flow for a STEP collection

	peak I/I factor of 1.6, giving it a PHWWF of 1.7 mgd. This appears to be a flawed analysis. Note that Dr. Tchobanoglous and Harold Leverence estimated the peak flow for STEP/STEG to be 1.3 mgd in their review of the *Rough Screening Report* (see LOWWP documents). The excess capacity in the STEP/STEG tank should accommodate variations in flow, allowing it to be distributed evenly throughout the day. An investigation into whether all peaking in a STEP/STEG system can be eliminated with centralized electronic monitoring and control of tank levels and pump operation should be done. Asano et. al. in *Water Reuse* (Metcalf & Eddy textbook, 2006) indicate that "remote monitoring using telemetry systems is becoming a more feasible option for onsite applications" (p. 824). The authors state that web-based monitoring systems can "make it possible to economically and reliably operate and maintain a large number of decentralized systems. Further, online monitoring systems allow management organizations to diagnose and repair problems before the system user is aware of any problem" (p. 824). Remote monitoring would likely be cost effective for these reasons and others (e.g., use of non-peak hours for pumping to save energy costs).	system is estimated to be 1.2 mgd, which is consistent with previous comments received and the ability for STEP tanks and system controls to attenuate some of the peak flows.
5	The TM further neglects to mention that the shallower, smaller, and more flexible STEP/STEG pipes permit easier detection of leaks, and more rapid, less costly repairs, than the deeper, larger, and technically more demanding gravity pipes, especially since STEP/STEG systems will not have as much pipe buried beneath paved streets or utility infrastructure.	The Fine Screening Report estimates operations and maintenance costs for both gravity and STEP collection systems. The estimates include consideration of maintenance of pipes, lift stations, and STEP tanks and pumps.
6	The TM also fails to mention that the variations in the flows for a conventional gravity system make treatment (i.e., pollutant removal) significantly more difficult, and that problems with I/I are reduced directly in proportion to the number of individual on-site systems incorporated into a decentralized plan for the LOWWP.	Flow equalization is an important consideration for any treatment plant. The Fine Screening Report estimates the differences in impacts to the treatment process resulting from gravity or STEP collection system. It is estimated that the secondary treatment process for a STEP collection system will be smaller and require less energy.
7	If possible, the TM's discussion on "exfiltration" is even more incomplete and misleading than the discussion on I/I. The TM briefly mentions the EPA Study on exfiltration done in 2000, saying that exfiltration occurs when pipe is laid above the ground water, and concludes that "exfiltration is expected to be limited." While it concludes that exfiltration is worse from gravity systems, it also implies that exfiltration is not important because the water board is mainly concerned about nitrates entering the ground water. The following is a noteworthy quote from the 2000 EPA study the TM cites. Some of this quote also provides further insight into SSOs: "Exfiltration is different from sanitary sewer overflows (SSOs). SSOs are overflows from sanitary sewer systems usually caused by infiltration and inflow (I/I) leading to surcharged pipe conditions. SSOs can be in the form of direct overflows to receiving water, street flooding, and basement flooding; whereas exfiltration is not	There is little data or comparison of the potential for exfiltration in sewer collection systems. If a pipeline placed in high groundwater developed leaks, it would be expected to experience infiltration, unless it was under pressure. Regulations expected from the Regional Water Board are expected to include provisions for maintenance and monitoring that will identify and address the potential development of leaks. While

	necessarily caused by excess I/I and is merely caused by a leaking sewer from its inside to its surrounding outside. Untreated sewage from exfiltration often contains high levels of suspended solids, pathogenic microorganisms, toxic pollutants, floatables, nutrients, oxygen-demanding organic compounds, oil and grease, and other pollutants. Exfiltration can result in discharges of pathogens into residential areas; cause exceedances of water quality standards (WQS) and/or pose risks to the health of the people living adjacent to the impacted streams, lakes, ground water, sanitary sewers, and storm sewers; threaten aquatic life and its habitat; and impair the use and enjoyment of the Nation's waterways" (Page 1) The EPA study also says that exfiltration stems basically from the same causes as I/I (leaks in pipes), that significant exfiltration occurs nationally, and that an analysis of depth to ground water is important to determining the potential for exfiltration. It concludes, "Areas with significant portions of the system above, but in close proximity to, the groundwater table are probably at greatest risk." (Pages, 2 & 25). Clearly the potential for exfiltration in Los Osos from a gravity system (which will lie above, but in close proximity to, the water table in many parts of the community) deserves a thorough analysis, including a careful depth-to-ground water study (i.e., if the County and Brandman Associates decides to carry conventional gravity systems—or hybrid gravity systems—through the "co-equal" EIR analysis). Note that the TM effectively makes the case that exfiltration will get significantly worse over time in a gravity system by making the case (consistent with research) that I/I will get significantly worse over time. Ironically, the TM suggests exfiltration might be worse in Los Osos than in other locations by repeating the statement that sandy soil will reduce I/I (see footnote of Table 5). While this is an unsupported claim made by MWH in the 2001 project report, it tends to support that exfiltration (i.e., raw sewage) will move more rapidly down into the ground water and laterally into the bay.	the potential impacts of exfiltration will be considered in the EIR, it is important to note that any potential exfiltration will have the same pathogen and nutrient constituents that are present in the current septic tank discharges.
8	The Carollo Engineers reports for the LOWWP continue to acknowledge (consistent with research) that I/I will occur in a conventional gravity system, that it is significantly more serious than in a STEP/STEG system, and that it gets worse over time. By implication (and also consistent with research) the same is true for exfiltration. Easy-to-locate, irrefutable, and overwhelming research and data continue to link I/I and exfiltration to groundwater and/or surface water contamination. The LOWWP will be adjacent to a State Marine Reserve and National Estuary, and it's being constructed under a zero-discharge order from the Regional Water Board to reduce impacts to an impaired water resource. All this begs the question: Why hasn't the LOWWP process screened out gravity systems that are not completely sealed?	The potential impacts associated with the risks of exfiltration will be evaluated in the EIR. It is important to note that any potential exfiltration will have the same pathogen and nutrient constituents that are present in the current septic tank discharges, but at a much lower volume. The assertion that the Regional Water Board would not allow a gravity collection system is unfounded, as the Regional Water Board has previously approved a gravity collection system for Los Osos.