Technical Memorandum Name: **Effluent Reuse and Disposal, April 2008**
Commenter: **Gail McPherson**
Comments Date: **May 12, 2008**
Responses Date: **July 1, 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	Response comments from: Citizens for Clean water' intent is to put into the record for the county project consultants, as well as EIR consultant (MBA) that the technical memorandums, including this TM, require detailed third party review and validation to avoid compromising the legitimacy of the process and the project. The issues raised are limited, however I reserve the opportunity to add to comments in the future.	The current County process for project development includes the input or review of the following parties: Carollo Engineering, Cleath and Associates, County Public Works Department, Technical Advisory Committee, Michael Brandman Associates, Kennedy-Jenks Consultants, Hopkins Groundwater, NWRI Peer Review Panel.
2	**Seawater Intrusion Mitigation**: The background in section 2.0 states that the existing discharges from residential septic tanks currently provide mitigation for sea water intrusion on the order of 90 AFY. Collection of the wastewater flows will increase the sea water intrusion problem from 460 to 550 AFY, unless mitigated. The threat of seawater intrusion and sustainability of the community's water supply is the impetus for the reuse and disposal alternatives, and the comparison of alternatives based on potential for mitigation of seawater is a principle benefit of the wastewater project. This report is absent of the benefits put forth in the Ripley Pacific plan with a agriculture reuse/disposal option that provided for storage and handled 100% of the flows. The true representation of an in Lieu or true Ag exchange program provides the benefits of full effluent handling with cost savings on treatment (Reference Ripley pacific project update ex summary pg 9)	This tech memo does analyze agricultural reuse in Section 3.3 and presents potential project options that utilize agricultural reuse in Section 5.2. Agricultural reuse and exchange do not have the capacity required to handle 100% of the treated effluent. Capacities are summarized in Table 2. Agricultural exchange is the exchange of potable groundwater used for irrigation for treated wastewater effluent. The agricultural exchange option would require implementation by the community water purveyors (LOCSD and/or Golden State Water), with the agreement of farmers. Ultimately, the development of a basin management plan by the community water purveyors, in cooperation with the County, will drive decisions on the most cost effective methods for reuse of treated wastewater effluent and development of future water supply enhancements.
3	Other important factors to consider is that the disposal option for Broderson is likely over stated with the cost of $6 million to handle just a portion	Extensive scientific study and prototype testing by experts in the fields of geology, hydrogeology,

	(40,000 gpd) of capacity. However, the charts in Figures 9 and 10 misrepresent the flows to Broderson at 700,000 gal per day during wet weather. Residential leach field testing was used.(criteria is discussed further in comments.)	engineering, and environmental science from many different agencies and consulting firms over the last 20 years has consistently supported the conclusion that the site has the capacity for high rate infiltration at approximately 800,000 gpd.
4	The Tri-W project included leachfields at the Broderson site, and they seem to be forced back into the options and their possible benefits exaggerated. In the original plan used additional sites on the east side of town as the only reuse/disposal alternative. The sum of the capacity for disposal by the sites in the Tri-W project did not meet the required capacity for buildout flow. The shortfall in capacity was deferred to a future project to solve.	The Broderson percolation site is one of the most effective means of mitigating sea water intrusion. However each reuse and disposal option has physical limits to the level of water resources benefits provided. It is important to have multiple reuse and disposal options for the wastewater project. Project configurations which provide the capacity required to handle 100% of the treated effluent are presented in Section 5.2.
5	Because of this project element flaw, the fine screening repeated the coastal commission findings that Broderson represented deferred project elements, both for treatment and for capacity, since harvest wells/blending stations was not included or treatment capacity for the nitrates retained in the harvest water. Note the statements in the NWRI review of the Ripley Pacific project report (pg 63.5.3): (and referenced in p2-2 of fine screen) 3.5.3 "If the Broderson site is used for effluent disposal, it is important to evaluate compliance with the new DHS Groundwater Recharge Reuse criteria (because there is no vadose zone and there would be intentional recharge to the upper aquifer, which has historically been used for potable supply).	Previous project reports established that Broderson has the capacity for 800,000 gpd of percolation. However, over time, there was the potential for up to 400,000 gpd of shallow groundwater to be harvested near Sweet Springs and Morro Bay. The options presented in Section 5.2 of this tech memo utilize a daily average of 400,000 gpd to avoid the potential need for harvest wells. Recent discussions with the State confirm that disposal at Broderson complies with groundwater recharge criteria.
6	The TM provides an incomplete analysis of true Ag. Exchange program.. The TM report(pg 2 2.1) states that mitigation from the wastewater project alone provides a mitigation level 2, which is equal to 190 to 240 AFY. Broderson receives a mitigation factor of 0.22. The Cleath report indicates that 448 AFY is current level of "septic returns on west side" and Broderson is also 448 AFY, then MF for Broderson is actually 0.0---- since it all goes down gradient to the bay front. To avoid the need for harvest wells, a rate of 448 AFY is recommended, which does not exceed the current level of septic returns on the west side, and therefore would not adversely impact existing shallow water conditions along the bay front.	The assertions in this analysis are incorrect. Compared to septic tank discharges, percolation at the Broderson site results in a higher hydraulic head above the lower aquifer due to more than 150 feet of separation to groundwater. This condition forces more water into the lower aquifer, resulting in the 0.22 factor. Percolation at Broderson recharges the lower aquifer more effectively than septic tank discharges.
7	**Why use Broderson?:** The history of the project and the efforts to date support claims that the design criteria developed for the Broderson site was erroneously applied in order to "reverse engineer" an already purchased	Extensive scientific study and prototype testing by experts in the fields of geology, hydrogeology, engineering, and environmental science from many different agencies

	via partial water board grant, a capacity limited disposal field. Why use Broderson at all. Winter storage is a concern, but the cost (over $6 mil) compared to other options is unreasonable.	and consulting firms over the last 20 years has consistently supported the conclusion that the site has the capacity for rapid infiltration.
8	Regulatory issues are triggered at Broderson, and must be accounted for. Because the TM ignores this, the consequence of another "deferred project" to meet requirements after selection could result. This a risky piece of the 'disposal' plan.	Regulatory issues were addressed and the use of the Broderson site for effluent percolation was fully permitted for the previous project by the appropriate resource agencies
9	The April Staff report to the Board of Supervisors by the County staff indicated that the water reuse/disposal piece of the project is just 20% of the total cost. The rest of the projects 80% will be subject to Design-Build proposals. However in this case the 20% value could drive up the cost of the largest piece of the cost by failing to explore, validate and justify the 'Best Value' option to meet future sustain ability issues.	It is important to maintain design control of the effluent reuse and disposal options to allow for cooperative management of water resources between the County and community water purveyors and ensure the most cost effective program to meet the long term water supply needs of the community.
10	The contentious history of the Broderson site was the point of challenge for the many claims and arguments for a disposal site that could support and justify the Tri W treatment site based on proximity cost savings. This is no longer relevant.	Regardless of proximity to the treatment plant, percolation at the Broderson site is one of the most cost effective options for providing year round capacity for effluent disposal and mitigating sea water intrusion.
11	**Reuse/Disposal TM:** Note two paragraphs on page 7 (below): The leachfield prototype testing, analysis, and design capacity conclusions are presented in a 2004 geotechnical report (Fugro West, 2004). A maximum application rate of 30 gallons per day per square foot (gpd/ft2) of effective infiltration area in the leachfield trenches was recommended, based on an observed ultimate infiltration rate of 180 gpd/ft 2 during testing. Using this application rate, a minimum 10-feet spacing between trenches, the requirement for leachfield wet-dry cycles, a 100 percent capacity redundancy, and the dimensional constraints of the Broderson site, the previous project (2001) developed the Broderson leachfield design with an average application rate of closer to 7 gpd/ft2 at full capacity. The hydraulic loading capacity of the site is presented in a 2000 hydrogeologic study (Cleath & Associates, 2000). The estimated annual hydraulic loading capacity of the Broderson site is 896 AFY, but at that rate would require harvest wells to prevent rising water near the bay front (Cleath & Associates, 2000). To avoid the need for harvest wells, a rate of 448 AFY is recommended, which does not exceed the current level of septic returns on the west side, and therefore would not adversely impact existing shallow water conditions along the bay front.	Noted.

12	Claims that the original reports MWH/Fugro referenced the wrong EPA manual to arrive at the 30 gpd/sf should be investigated and explained. The strong evidence that capacity was "reverse engineered" at Broderson to justify the Tri W site based on proximity for discharge. (Coastal Commission de Novo hearing report).	The EPA's Process Design Manual, Land Treatment of Municipal Wastewater, October, 1981, is the correct reference for a rapid infiltration system for treated municipal wastewater. The EPA's Design Manual, On-Site Wastewater Treatment and Disposal Systems, October, 1980, provides standards for septic tank leach field disposal for onsite systems. It is **not** the correct manual to apply to disposal of treated municipal wastewater. Also see #10, above.
13	Please review the summary of testing protocol from March 9 2004 MWH Furgo report pg 3-7. The statement that 30 gpd/sf application rate is only 17% of measured infiltration rate is relevant to designing the soak cycle of rapid infiltration ponds, but not leachfields or infiltrator chambers. Additionally, please review MWH/Fugro which appears to have referenced the wrong EPA manual to arrive at the 30 gpd/sf. The conflicts in the criteria used for subsurface disposal, based on the water quality requirements (the quality of effluent, rate and volume applied, and the fate of the disposal of sewage effluent) must be reviewed, evaluated, and corrected for this site. Subsurface disposal is not in compliance with the Basin Plan, AB 885, and the criteria relied upon was questioned by the los Osos Community Services district in 2006 regarding the technical criteria. The letter questioned errors in four questions:	See above. The EPA's Process Design Manual, Land Treatment of Municipal Wastewater, October, 1981, is the correct reference for a rapid infiltration system for treated municipal wastewater. The use of the Broderson site for percolation of treated effluent has been approved by the State and Regional Water Boards and meets the Basin Plan. Infiltration rates established in draft guidelines under AB 885 are for onsite septic systems and the disposal of untreated septic tank effluent. They do not apply to the permitted disposal treated municipal wastewaster at the Broderson site.
14	First question: Referencing the December 16, 2002 report - *Project Design Criteria Technical Memo, pg 30 indicates that Broderson effluent disposal field has* a *design capacity of 810,000 gal per day (gpd) and dispersal area of 250' x 1,200' or approximately* 6.9 *acres. What is the assumed application rate for establishing 810,OOO gpd dispersal capacity?*	Based on the infiltration rate of 180 gpd/ft^2 observed during prototype testing, an application rate of 30 gpd/ft^2 in the percolation trenches was recommended. This provided a safety factor of 6. (Fugro Report, March 9 2004, pg 6-42). The project design spaced the percolation trenches over a total area of 6.9 acres. Therefore the application rate for 810,000 gpd over a 6.9 acre site is approximately 2.7 gpd/ft^2.
15	Second question References the Fugro report March 9 2004 (Attached pg 6-42) and questions the 30 gpd/sf recommendation for the Broderson site. The cited references are given as EPA 1981 (EPA 625/1-81-013, pages 5-15 to 5-19 located in Chapter 5 entitled "Rapid Infiltration Process Design."(This criteria requires systems using a wet and dry cycles)The question raised by the district is why the critiea for rapid dispersal is used when the site	The Fugro report references the EPA's Process Design Manual, Land Treatment of Municipal Wastewater, October, 1981, which applies to the design of a rapid infiltration system for treated municipal wastewater. The other EPA standards in question are for disposal of untreated septic tank effluent from onsite septic systems.

	was not designed to be operated as a rapids infiltration disposal site, which has other criteria for soak and dry cycles. The use of criteria for dispersal application rate determination-contained in EPA 1980 (EPA 625/180-012) and /or EPA 2002 (EPA 625/R-00/008) This was not corrected in the MWH project, and does not appear to be explored, explained or corrected in the current TM. The rates in determining capacity will result in much lower than 30 gpd.	They do not apply to disposal of treated effluent that meets water quality standards established by permit in the waste discharge requirements.
16	Third question LOCSD MWH sheet ED-C-330 dated February 16, 2004. with a revision notation of July 2005, by sjh of MWH and indicated a total infiltrative surface rate of 57,000 square feet (119,200 lineal feet by 3 feet wide) assuming half the field is at rest (according to the criteria used)	The effective infiltration area of the percolation trenches is approximately 59,000 square feet, with 100% redundancy for a total of 119,000 square feet. The percolation trenches are spaced at 10-foot intervals and are only a portion of the 6.9 acre site.
17	Fourth question September 27, 2000 the Governor signed legislation (AB 885) and asks to look at the application of subsurface disposal from this criteria. From the recent Regional water Board hearing, and the revised Basin Plan, Concerns 1} What is Fugro's 30 gpd/sf for Broderson: protocol for residential septage disposal systems is based on? 2} The Broderson perc. rates (2003): all but one was faster than one minute per inch at Broderson site. 3) The March 2007 AB 885 draft: Note Table 2 and Figure 1. Application rate is either "prohibited" or "zero" if percolation rate is faster than one minute per inch.(Maximum application rate is 1.2 gpd/sf.} 4} The Basin Plan update adopted on May 9, 2008 by the Regional water Board maximum percolation rate is one minute per inch, consistent with EPA manuals, and AB 885.	The draft guidelines for AB 885 and the pending Basin Plan update establish a limit of 1.2 gpd/ft^2 for the disposal of untreated septic tank effluent. This limit does not apply to the disposal of fully treated wastewater from a wastewater treatment plant that complies with water quality standards established in Waste Discharge Requirements. The recommendation of an application rate of 30 gpd/ft^2 for the Broderson percolation trenches are not related to disposal of residential septage.
18	Conclusion: The greatest concern is that the TM repackages data and recommendations derived from reports which have been challenged and are not considered reliable. The design criteria has not been scrutinized or corrected, or alternately, justified. The issues of assumed capacity, ignoring cycling rates, regulations for subsurface disposal, DHS issues, and other factors, the application of the 30 gpd/sf is not a legitimate application rate, and is not technically defended. The criteria used in the TM must be defensible, however the process has not subjected the TM's,(including the TM reuse and disposal) to independent evaluation, as requested several	The conclusion in this tech memo regarding the Broderson site are consistent with more than 20 years of analysis and study by independent agencies and professionals from many different jurisdictions and backgrounds. Application rates are derived from actual infiltration rates observed during prototype testing, with an appropriate factor of safety applied. Application rate standards for the disposal of untreated septic tank effluent found in AB 885 and the Basin Plan do not

	interested parties and by the TAC members. It is unacceptable to apply such reverse engineering for capacity, to avoid implications of DHS regulations through the term "disposal". It is not applying professional diligence to avoid application of AB 885 and Basin Plan criteria for subsurface disposal. Further confusion is inserted by inaccurately using the terms: "percolation rate", "application rate", and "infiltration rate" interchangeably. The EPA manuals these terms have very distinct and different meanings, but Fugro/MWH/Carollo/Wallace et al are using the three terms interchangeably. Broderson was the subject of challenge in the Coastal Commission hearings, the lawsuit by water purveyors, and other funding challenges. The original design was based on a project site decision that is not longer relevant Please send the TM back to the County engineering consultants to correct and to arrange for independent review, correction or validation and support of findings.	apply to treated municipal wastewater which has been permitted by the Regional Water Board.