MEMORANDUM

AVILA BY THE SEA

PRELIMINARY WATER AND WASTEWATER SYSTEM CAPACITY EVALUATION

Date: April 9, 2019

To: Rick Koon
San Miguelito Mutual Water Company

From: Tom Zehnder, PE 72702
Wallace Group

Subject: **Avila Beach Resorts Expansion of Facilities - Water and Wastewater Capacity Evaluation**

Executive Summary

Recently, as a part of the Conditional Will Serve request, for the Avila By the Sea project Avila Beach Resorts (ABR) engaged Wallace Group to provide an analysis of the additional water and wastewater impacts of the proposed facilities, including water management and the use of recycled water.

The proposed facilities are served by the San Miguelito Mutual Water Company, (SMMWC). SMMWC provides its customers (Shareholders) with domestic water and wastewater treatment within its approximate 2,000-acre service area. ABR is within this service area and is also a current shareholder with 141 shares.

Previously in April 2018, a Memorandum entitled: ABR Expansion of Facilities - Water Supply and Demand Evaluation (Appendix A-7), was prepared by Wallace Group and provided to the San Luis Obispo County Planning Department. The Memorandum concluded that the ABR project is within the Company's service area with ABR owning the number of shares necessary to provide domestic water and wastewater for both for its existing uses and proposed new facilities. During the design of the project, the type and number of units proposed for development have evolved.

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The purpose of this report is to respond to questions raised by SMMWC in a June 26, 2018 email from SMMWC to ABR in order to assist in SMMWC's review of the Resort's proposed facilities and issuance of a "Conditional Will Serve" based upon the current project configuration.

This report utilizes information in the 2018 Memorandum as well as the revised project components as referenced to response to SMMWC's questions to evaluate potential impacts to SMMWC's infrastructure and, SMMWC's ability to provide services to the expansion along with its existing customers, all as part of the buildout of the master plan for San Luis Bay Estates.

This Report includes, in response to SMMWC's questions, a hydraulic analysis and model of the water distribution system, analysis of the potable water demands of the proposed development, and the capacity of the wastewater collection and pumping facilities

Findings:

As a result of further analysis of the current ABR project and in response to SMMWC's comments, this analysis indicates that the additional demand can be met with the existing water and wastewater infrastructure.

Background

It is our understanding that ABR has been a shareholder of SMMWC's since its creation and presently holds 141 shares. Currently, 6 of the 141 shares are active, and the other 135 shares dedicated to ABR's proposed additional facilities.

As indicated in Exbibits 1 and 2, the proposed additional facilities include 60 hotel suites, 35 bungalows, 36 cottages, and 4 other guest units. This plan also includes the renovation of the existing lodge by converting the existing pro-shop to a lobby and modifying the existing bar (no increase in capacity). Additional project components include a new spa facility, cafe, addition of conference rooms as well as 24 platform tent campsites using chemical restrooms.

The purpose of this memo is to respond to the following questions raised by SMMWC in a June 26, 2018 email from SMMWC to ABR in order to assist in SMMWC's review of the Resort's additional proposed facilities and issuance of a "conditional will serve."

1. Water Distribution - Analyze the hydraulic impacts of the Resort's new facilities on the existing water distribution system by modeling the existing and proposed system additions.
2. Potable Water Treatment – Prepare average annual and max day demand scenarios of potable treated water requirements generated by the Resort's new facilities.
3. Wastewater Collection– Prepare a capacity analysis of the gravity line in Harford Canyon and the pumping facilities from Lift Station 1 to the Treatment Plant based upon the additional flows from the Resort's new facilities.

Sources of Water Supply

SMMWC, formed in 1987, today is served by multiple sources for its domestic water supply, with the primary source consisting of three (3) riparian wells that draw from the underflow of San Luis Creek. Historically SMMWC has drawn up to 185 AF annually from these wells.

In the late 1980s, SMMWC sought to add a "backup water" supply. This was accomplished by drilling new wells in upper Harford Canyon, which were successful in providing a new water source. These wells have been in production and used as supplemental irrigation on the Resort golf course since 1992. Their production and sustainability were subjects of prior EIRs. They have been in continuous use by ABR since 1990 to further demonstrate their viability. The water quality of these wells is low and would require treatment should they be called upon for domestic use.

Additionally, in 1993 the Company acquired 275-acre feet of State water, equal to the full projected demand on SMMWC for "build out" of the SMMWC service area. This water source has been online and utilized by SMMWC since 1995 with annual deliveries subject to peaking constraints on the Lopez pipeline. This negates the need to treat and utilize the upper Harford Wells for domestic supply, but they remain as an additional source of domestic water if needed, for SMMWC

The State water project deliveries have been inconsistent. As a result, SMMWC negotiated a contract to obtain a 100%" drought buffer" of State water. As the result, it is our understanding that SMMWC has had the ability to manage its multiple sources to meet shareholder demands even through the recent drought. The State Water contracts were entered into between SMMWC and County Flood Control District for the purpose of the original allocation of 275 AF and an additional 275 AF for the required "drought buffer" supply for SMMWC's shareholders. Thus, guaranteeing full delivery of 275 AFY when State deliveries are cut to 50%. To fund these purchases, each development within the Bay Estates had a separate contract arrangement with SMMWC to supply its future developments.

ABR presently holds contracts with SMMWC for a total of 20.28 AF per year of State Water. (Appendix A-8 - ABR State Water effective 3/4/1993, with Exhibit E attached (13.5 AF) and Appendix A-9 - EMOE State Water (6.78 AF).

The State Water allocations for new developments are predicated upon use as described in Exhibit E of the State Water contract. In analyzing the proposed additional facilities and applying the water demands shown in column of Exhibit E that pertains to development, "without landscaping," the demand of ABR's new facilities were calculated. Where Exhibit E did not apply, Metcalf and Eddy demand factors were used. The proposed new facilities will require the dedication of these State water contracts.

In 1995, SMMWC adopted a Water and Wastewater Master Plan as part of the EIR for Tract 2149. The Plan included SMMWC's existing systems as well as projected demands for future development(s) including the ABR project proposed at that time. This included the utilization of Drought Buffer State Water. At that time ABR's future plans included one hundred (100) hotel/ cottage/ units, as well as a new clubhouse, additional restaurant, and expanded lodge and other various recreational uses. At that time, the Resort's domestic water provision was estimated to require up to an additional 35.89 acre-feet per year (AFY)[1].

[1] Provided under Projected Water Use for New Users on page 16 of the 1995 Water and Wastewater Master Plan. Appendix A-1.

Current day water conservation planning and the revised scope of these additional facilities has resulted in far less demand than the "planned" allocation, specifically, 20.26 AFY currently anticipated, compared to 35.89 AFY previously planned. A net decrease of 15.63 AFY.

In 2006, the 1995 Water and Wastewater Master Plan was updated to further assess the adequacy of SMMWC wastewater capacity and water supply(s) including its ability to meet shareholders' current and future demands. The update includes a brief summary of the Company's history, in which it identifies how the number of planned units and facilities have changed over time.

According to the 2006 Master Plan update; as of August 2005, 324 hotel/cottage/timeshare units were planned for at buildout. The two projects currently in progress fulfill the anticipated buildout of those units.

Water Supply Findings

The total domestic water demand for the ABR future commercial/ recreational development in the 2006 Update was estimated at 42.97 AFY[2]. The currently proposed "additional ABR facilities" are expected to require 20.26AFY with irrigation remaining separate. Additionally, it is our understanding that the Cottage site demand is less than 14 AF including landscaping.

Wastewater System Findings

Also, the 2006, SMMWC master plan recognized that SMMWC's lift stations needed to be upgraded. It is our understanding that the shareholders and developers paid their respective costs to provide projected system needs. The Sewer Capacity Improvement Reimbursement Agreement for the ABR property (executed between Avila Beach Resort and SMMWC) required ABR to fund its share of upgrades to SMMWC's wastewater collection system. These upgrades were completed 10 years ago to accommodate future SMMWC master plan capacity needs.

The Agreement limited ABR's future facilities to 80 gallons per minute during peak flow, and an average 22,650 gallons per day. With today's water conserving fixtures, the

[2] Provided under Exhibit 7 Annual Water Demand By Usage Category in the 2006 Water and Wastewater Master Plan Update, page 27. Appendix A-2.

wastewater flow from the Resort's proposed new facilities is anticipated to be on the order of 77.5 gallons per minute during peak flow, and on average 18,600 gallons per day. This flow is below the amount allowed by the Agreement.

Methodology

This memo provides an evaluation of the current proposal for additional domestic water and wastewater demands as a result of the new ABR facilities. This analysis indicates that the additional demand can be met with the existing water and wastewater infrastructure.

Potable Water Demand and Treatment Evaluation

Domestic water supply is currently and will continue to be provided to the new facilities by SMMWC. It should be noted that all ABR's existing and new landscaping/turf irrigation will continue to be met with ABR's separate, independent irrigation resources and facilities (specifically the ABR wells). Thus, all new potable water demand excludes exterior use (i.e., landscaping).

An analysis of the expected "new demands" was performed to determine the adequacy of the existing system's supply capacities. Average annual and max day demand scenarios for potable water treatment capacity were calculated for the current proposed new facilities layout based upon the water use factors provided in Exhibit E or Metcalf and Eddy. Given that the hotel suite/cottage/bungalow units are the primary drivers of water demand, a comparative analysis was performed using the annual water demand for the San Luis Bay Inn. Based upon 2018 meter readings, the annual demand for the Inn as a whole was approximately 4.842 million gallons and when divided by 144 units results in a gross unit demand of approximately 0.103 AFY. The gross amount includes a mixture of 144 studios, 1-bed and 2-bedroom units as well as pools, 12,000 sq. foot conference room, lobbies and restaurants. The net, unit only, demand would be under 0.10 AFY. This correlates with the 0.10 AFY/bedroom unit that is used for this project's projections.

The Project Areas shown below in Table 1 relate to the Areas indicated in Exhibits 1 and 2 and summarize the proposed project's potable water demand, resulting in an overall added average demand of 18,082 gpd and a maximum daily demand of 42,203 gpd on the existing water system.

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Table 1 – Proposed Additional Potable Water Demand Estimates			
New Facility Component	**Annual Demand (AFY)**	**Average Annual Daily Demand (gpd)**	**Maximum Daily Demand[3] (gpd)**
Area 1			
36 one-bedroom Cottages	3.60	3,214	8,034
60-Unit Hotel/Inn Suites	6.00	5,356	13,390
Spa Building[4]	2.93	2,611	3,528
Beach Club Addition[5]	0.18	161	402
Amphitheater (Crow's Nest)	Not Connected to Potable System		
Lodge/Headquarters Renovation with 1 Guest Unit[6]	0.10	89	223
Area 2			
Welcome Center	0.36	321	803
New Café[7]	0.39	348	870
Area 3			
Pavilion and Pool	0.30	268	670
13 one-bedroom Bungalows	1.30	1,160	2,901

[3] Based on historical experience, typical values for the maximum daily demand peaking factor range from 2.0 to 2.5 for residential and commercial developments. 2.5 was used for this analysis
[4] Spa Building consists of 6,900 sqft health club and 18,850 sqft of conference room
[5] Addition of second story 3,000 sqft conference room
[6] Lodge renovation consists of converting the existing Pro Shop to a Lobby, Bar modifications not increasing capacity and the addition of a Guest Unit.
[7] New Café consists of 1500 sqft full-service restaurant

New Facility Component	Annual Demand (AFY)	Average Annual Daily Demand (gpd)	Maximum Daily Demand[8] (gpd)
18 two-bedroom Lake Bungalows	3.60	3,214	8,034
Camping[9]	Not Connected to Potable System		
3 Units at The Nest Villas	0.30	268	669
Area 4			
4 three-bedroom bungalows	1.20	1,072	2,679
Total Anticipated Treated Potable Water Demand	**20.26**	**18,082**	**42,203**

Currently, SMMWC's potable water system experiences an average daily demand of approximately 160,000 gpd and a maximum daily demand of 400,000 gpd[10]. According to SMMWC, the maximum output of the water treatment plant is 690,000 gallons in 24 hours. The proposed new facilities are estimated to increase the average daily demand and maximum daily demand by a total of 18,082 and 42,203 gpd, respectively. All increases are well within the treatment system's 690,000 gpd capacity.

Note that the water usage associated with new pools at the hotel and spa are considered negligible for the purposes of this study.

Water Distribution System Evaluation

SMMWC's existing water system is comprised of five (5) water storage tanks, three (3) booster pump stations, and approximately 14.3 miles of PVC and AC water mains, ranging in size from 4-inch to 12-inch. A water model was prepared in WaterCAD V8i to better understand the water system's current and proposed hydraulic conditions. The

[8] Based on historical experience, typical values for the maximum daily demand peaking factor range from 2.0 to 2.5 for residential and commercial developments. 2.5 was used for this analysis
[9] Camping will utilize portable toilets
[10] Provided via email from SMMWC. Appendix A-4

water model was developed using GIS files provided by Water Systems Consulting, Utility Plan CAD Drawings provided by Above Grade Engineering, and contour data obtained from the National Oceanic and Atmospheric Association (NOAA). All new water mains were assumed to be PVC with a Hazen-Williams roughness coefficient ("C" factor) of 150. Existing water mains were assumed to have a C Factor of 140. Table 2 identifies the tank information important to the hydraulic model.

Table 2- SMMWC Existing Tank Summary

Tank	Storage Capacity (gal)	Bottom Elevation (ft)	Overflow Elevation (ft)
100	225,000	369.0	397.5
200	225,000	369.0	397.5
300	225,000	368.1	396.6
400	225,000	367.0	395.5
550	130,000	43.8	61.8

The flow requirements examined in the hydraulic model include average day demand (ADD), peak hour demand (PHD), and maximum day demand (MDD) plus fire flow (FF). Typically, especially for small water systems such as this one, maximum day demand plus fire flow is the driving condition that will determine if the existing water system can serve the existing and new facilities. The following parameters were employed to identify conditions for each model run:

- Per the State Water Resources Control Board's Division of Drinking Water Title 22, domestic pressures shall be above 40 psi for ADD, MDD, and PHD. Normal operating (static) pressure should be within the range of 40-80 psi. Pressures higher than 80 psi are acceptable within the distribution system but should be reduced through a pressure reducing valve (PRV) to 80 psi or lower at the service connection to prevent water hammer effects or leakage. It is also recommended to maintain water pressure within the distribution system at or below a maximum ceiling of 150 psi.

- Per Collings and Associates (fire protection engineer), the minimum flow from any hydrant shall be 1,500 gpm discharge at 20 psi residual pressure, based upon the proposed development being a Type V-b building, fully-sprinklered.

Note that the 20-psi minimum pressure requirement is throughout the entire service area, not just at the fire flow location in question.

Connections to SMMWC Existing Water System

Area 1

The water main serving facilities in Area 1 will tie-in to the existing water system at two (2) locations: one near the existing amphitheater at the north-west end of the area and the other at the 8-inch water main on Ana Bay Road. The line serving the Spa will tie-in to the existing 8-inch water main in Harford (Lupine Canyon Road). The renovation of the existing restaurant and Beach Club existing facilities into the lodge does not require any new water or main connections. It is our understanding that the existing Resort facilities utilize approximately 2 AF of domestic water, annually, through its 6 meters.

Area 2

The Beach Recreation/Adventure Center will tie-in to the existing 8-inch main on Blue Heron Drive. The current design shows a 4-inch private water line serving the new facility; however, it is recommended that the water main be an 8-inch to accommodate for fire flow.

Area 3

The new water main serving the Lake Pavilion and Bungalows will tie-in to the existing 8-inch water main at two (2) locations: one at the end of the existing 8-inch water main on Blue Heron Drive at the current Maintenance Facility and the other at the 8-inch main in Coffeeberry Place. Extending the water main to Coffeeberry Place creates a "looped water system," beneficial to the overall SMMWC system and also allows for reliability and redundancy. It is recommended that the water main crossing San Luis Obispo Creek to serve the project be sized as an 8-inch PVC line.

Area 4

The Four 3-bedroom bungalows in Area 4 will be served off the existing 8-inch water main on Lupine Canyon Road.

System Pressure Results

As discussed, normal operating pressures should be within 40-80 psi under average day, maximum day, and peak hour demand. Based on the water model created, the existing pressures at the existing and proposed facilities ranged between 135-166 psi. These high pressures are due to the large elevation head between the supply tanks and the proposed development. Since these pressures are above the 80-psi threshold, it is recommended that all new facilities have individual PRVs to prevent water hammer effect or leakage. Recommended PRV locations are shown in Exhibit 1 for Areas 2, 3, and 4. Area 1 will require individual PRVs on each unit due to the looping in the water system. Table 3 summarizes the highest system pressure experienced at average day demand for each new facility.

Table 3- System Pressure Results Under Average Day Demand

New Facility Component	**Pressure (psi)**
Area 1	
One-bedroom Cottages	158
Hotel/Inn Suites	154
Spa Building	160
Lodge/Headquarters Remodel	161
Beach Club Addition	161
Area 2	
Welcome Center	166
New Cafe	166
Area 3	
Pavilion and Pool	163
One-bedroom Bungalows	165
Two-bedroom Lake Bungalows	165
Camping	165
The Nest Villas	144
Area 4	
Three-bedroom bungalows	135

The resulting pressures identified in the model are within a range of +/- 5 psi. Included in this pressure analysis is the installation of large diameter primary water meters (meters sized to serve the overall new facility components) as well as smaller meters

sized to serve individual units. The water model does not include any double detector check valves (DDCV). If DDCVs are installed, these typically have a 7 to 10 psi drop across the DDCV.

Fire Flow Results

As discussed, small water systems, such as this one, are primarily evaluated to determine if the existing and proposed water system can meet the required fire flow during maximum day demand. Fire hydrant locations have not yet been identified for the proposed site plan. Fire flow results were noted at the service node to each new facility in the model. Table 4 provides the worst-case fire flow result at each new facility. All fire flow service laterals were modeled through a 6-inch PVC line. Areas 2, 3, and 4 were modeled with PRVs shown on Exhibit 1.

Table 4- Fire Flow Results

	Required Fire Flow (gpm)	Required Residual Fire Flow Pressure (psi)[11]	Total Combined Flow (gpm)[12]	Total Available Flow (gpm)	Available Residual Fire Flow Pressure (psi)
Area 1					
One-bedroom Cottages	1,500	20	1,506	4,000	84
Hotel/Inn Suites	1,500	20	1,509	4,000	104
Spa Building	1,500	20	1,503	4,000	89
Lodge/Headquarters Remodel	1,500	20	1,501	4,000	104
Beach Club Addition	1,500	20	1,501	4,000	104
Area 2					
Welcome Center	1,500	20	1,501	4,000	32
New Cafe	1,500	20	1,501	4,000	28
Area 3					
Pavilion and Pool	1,500	20	1,501	2,939	20

[11]Per Department of Drinking Water Standards, minimum residual pressure under fire flow conditions is 20 psi. Refer to Exhibit 1 for node locations

[12]Total Combined Flow includes Max Day Demand (MDD) plus Required Fire Flow.

	Required Fire Flow (gpm)	Required Residual Fire Flow Pressure (psi)[13]	Total Combined Flow (gpm)[14]	Total Available Flow (gpm)	Available Residual Fire Flow Pressure (psi)
One-bedroom Bungalows	1,500	20	1,502	2,744	20
Two-bedroom Lake Bungalows	1,500	20	1,506	3,202	20
Camping	1,500	20	1,503	3,202	20
The Nest Villas	1,500	20	1,501	2,554	20
Area 4					
Three-bedroom bungalow	1,500	20	1,503	4,000	26

Based upon the results in Table 4, the new facilities meet the 1,500 gpm at 20 psi residual pressure minimum fire flow requirement during max day demand. In the hydraulic model, the limit for total available fire flow was set to a maximum of 4,000 gpm. Fire flows in Table 4 show the total available fire flow limit before any node in the existing and proposed system drops below 20 psi for residual pressure. During fire flows in Area 3, the residual pressures at Pelican Point and Indian Hill range between 21-48 psi at service nodes higher than 200-feet in elevation.

It should be noted that assumptions regarding pipe size and material were made utilizing the layout of the existing SMMWC water system in the hydraulic model. To verify the validity of the hydraulic model results, fire hydrant testing to calibrate the water model will be scheduled with SMMWC.

Waste Water Collection System Evaluation

The SMMWC wastewater collection system is comprised of gravity sewer mains and a series of three sewer lift stations with “force mains,” Lift Stations #1 (Avila Village), #2 (BR), and #3 (lower Wild Cherry), to transport wastewater to the community wastewater

[13]Per Department of Drinking Water Standards, minimum residual pressure under fire flow conditions is 20 psi. Refer to Exhibit 1 for node locations
[14]Total Combined Flow includes Max Day Demand (MDD) plus Required Fire Flow.

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treatment plant in upper Wild Cherry Canyon. The system employs a SCADA system to monitor and control the various system components. The proposed new facilities would add wastewater flow to the existing Lift Stations #2 and #3 discharge force mains, as well as to the gravity sewer flowing into existing Lift Station #2. A capacity analysis was performed on this existing waste water collection system to verify impacts and capacity for the new facilities on the existing system. See Exhibit 3 for a line diagram representation of the existing system and proposed additions and Exhibit 2 for system layout.

The average day wastewater flow scenarios were calculated assuming 90% of all potable water usage being recovered as wastewater. Peak hour flow estimates were calculated using a peak-hour factor of 6.0[15]. Table 5 summarizes the proposed project's wastewater flow, which totals 18,598 gpd average daily flow and a peak hour flow of roughly 77.5 gpm.

Table 5 – Proposed Wastewater Flow Estimates

New Facility Component	Proposed Average Day Flow (gpd)	Proposed Average Day Flow[16] (gpm)	Proposed Peak Hour Flow (gpm)
Area 1 West – Hotel and Cottages	7,713	5.4	32.1
Area 1 East – Spa, Bungalows	2,350	1.6	9.8
Area 1 South – Beach Club and Lodge (renovated)[17]	225	0.2	0.9
Area 2 – Welcome Center	1,567	1.1	6.5
Area 3 – Lake Pavilion, Bungalows	6,743	4.7	28.1
Total	**18,598**		**77.5**

Note that pool draining operations would be done during off-peak periods and were not included in the anticipated peak hour flows. It is also important to note that the analysis

[15] Typical published values in small residential and light commercial developments range up to 4.0. A peaking factor of 6.0 was specified in this case to ensure a conservative analysis of this resort-style development.
[16] Proposed average day flows not reported for areas served by lift stations; flows from these areas are dictated by the lift station pump discharge rate (listed in the Peak Hour Flow column).
[17] Lodge renovation consists of converting the existing Pro Shop to a Lobby, Bar modifications not increasing capacity and the addition of a Guest Unit.

presented above reflects a scenario where all peak flows occur concurrently, which tends to overestimate actual flows. For instance, the Lake Pavilion would most likely experience its peak flow during a different time than the welcome center and housing. As mentioned previously the Sewer Capacity Improvement agreement[18] between the Resort owner and SMMWC limits the maximum flow rate into the system of 80 gpm. Therefore, the peak of 77.5 gpm is less than the contractual limit of 80 gpm.

Evaluation of Existing Lift Station #1

Lift Station #1 collects wastewater from a number of surrounding developments and discharges it into a 6-inch PVC force main that runs approximately 5,800 ft before discharging into a manhole and then flowing by gravity to Lift Station #2. Lift Station #1 is 6 ft in diameter and approximately 22 ft deep, with two 6.5 hp submersible pumps. In simplex operation, the pumps produce an estimated 185 gpm. In duplex operation, the pumps produce an estimated 230 gpm[19].

A portion of the proposed new facilities will add flow from two private lift stations into the existing 6-inch" force main between Lift Stations #1 and #2. The proposed private lift stations include:

1. Area 2 – Welcome Center
2. Area 3 - Lake Pavilion

These private lift stations will be provided with standby generators in the event of a loss of utility power.

The main impact to Lift Station #1 is the increase in friction head seen by the existing Lift Station #1 pumps, due to the added flow, midstream into the force main. As can be seen in the Table 5, the estimated peak hour flows into these private lift stations are relatively small, to the point where the size of lift station may be determined by the smallest practical system that is available for purchase. For this analysis, a minimum flow rate of 15-20 gpm was assumed for each of the private lift stations. A revised system curve incorporating flows from all three private lift station was plotted on Lift Station #1's theoretical pump curve to estimate the resulting pump flow rate in the event

[18] Sewer Capacity Improvement Reimbursement Agreement, see Appendix A-3
[19] Existing Lift Station #1 dimensions and pump information provided via email by SMMWC. Appendix A-4

where all three private lift stations are running simultaneously along with Lift Station #1. Table 6 shows the anticipated reduction of flows at Lift Station #1.

Table 6 – Reduction in Lift Station #1 Capacity		
	Existing (gpm)	Proposed (gpm)
Simplex Operation	186	185
Duplex Operation	230	220

Estimated adjustments to the existing lift station pump curves can be seen in Exhibit 4. The 1995 Master Plan notes that at full buildout of planned developments contributing to Lift Station #1, expected maximum flow is approximately 94 gpm. Since no significant additional flows have been added to Lift Station #1's collection system, the existing pumps if operating per design are sufficient to handle peak hour flows with the added flow from the proposed private lift stations. Even though pump controls would be utilized to avoid simultaneous pumping, under a worst-case scenario where all lift stations are operating simultaneously, the following flows and velocities can be expected:

Table 7 –Force Main Flows and Velocities (all lift stations running)		
Segment	**Flow (gpm)**	**Velocity (fps)**
LS #1 → Area 3 LS tie in	220	2.50
Area 3 tie in → Area 2 Caretaker Unit tie in	250	2.84
Area 2 Welcome Center tie in → Gravity manhole	265	2.84

Evaluation of Existing Lift Station #2

Lift Station #2 collects wastewater from existing Kingfisher Canyon, part of Heron Crest, and the existing Avila Beach Resort facilities, as well as from Lift Station #1's force main, and discharges it into a 6-inch PVC force that runs approximately 5,000 ft to Lift Station #3. An existing lift station serving the San Luis Bay Inn discharges directly into

this force main[20]. Lift Station #2's wet well is 8 ft in diameter and 13.3 ft deep, with two 30 hp submersible pumps. In simplex operation, the pumps produce an estimated 475 gpm. In duplex operation, the pumps produce an estimated 600 gpm[21]. The lift station is also equipped with (2) 8 ft diameter, 5 ft deep storage wells

The proposed flows to Lift Station #2 are included in Table 8.

Table 8 - Estimated Peak Hour Flows into Lift Station #2 (gpm)

	Existing	Proposed
Kingfisher Canyon	51	51
Heron Crest	13	13
FM #1 which includes LS #1 and the new private lift stations in areas 2 and 3	230	230-285[22]
Area 1 West – Hotel and Cottages	N/A	32
Area 1 East – Spa, Bungalows	N/A	15.2
Area 1 South – Lodge (renovated)	13	13.9
Total (gpm)	307	425

Based on this analysis, Lift Station #2 is capable of handling the added flows from the proposed new facilities during the peak hour condition. However, the required response time in a peak hour emergency will be reduced from approximately 26 minutes to 19 minutes due to this added flow, unless modifications are made to the lift station's wet well capacity. Pump cycling is also affected by changes to system flow and wet well capacity and should be considered in the design.

Evaluation of Existing Lift Station #3

Lift Station #3 collects wastewater from the Lift Station #2 force main (which also takes flow from the San Luis Bay Inn lift station) and discharges it into an 8-inch PVC force main that runs approximately 7,400 feet to the existing wastewater treatment plant. Lift Station #2 is approximately 19 ft by 9 ft rectangular, 5 ft deep, with two 100

[20] Existing Sewer maps and the 1995 SMMWC Master Plan indicates that flow from San Luis Bay Inn is collected in Lift Station #2, however an email from SMMWC clarifies that the flow is discharged directly into the force main. See Appendix A-5
[21] Existing Lift Station #2 dimensions and pump information provided via email by SMMWC. See Appendix A-4
[22] This range is based upon the three-private lift stations operating singularly or simultaneously

hp progressing cavity pumps. In simplex operation, the pumps produce an estimated 550 gpm. In duplex operation, the pumps produce an estimated 750 gpm[23].

While the proposed new facilities do not change the flow rate. Lift Station #3 will operate more frequently.

Regardless of Lift Station #2 discharge flow rates, the proposed additional flow to the system will result in more pump cycles per day, which may result in more frequent maintenance.

Evaluation of Existing Gravity Sewer

The existing 10" AC gravity sewer from the manhole near the turnoff at Lupine Canyon to Lift Station #2 collects wastewater from existing developments in Harford Canyon and the Avila Beach Resort facilities, as well as from Lift Station #1's force main. The gravity sewer is split into two segments by a manhole. Refer to Table 8 above for flows contributing to this gravity sewer

Except for Area 1 West, flow from all the areas listed above will enter the first segment of the gravity sewer at the manhole near the turnoff at Harford Canyon and Ana Bay. Wastewater from Area 1 West will enter the second segment of the gravity sewer at the next manhole. The table below summarizes the existing and proposed flows in both segments of the existing gravity sewer during peak hour flow conditions.

Table 9 – Capacity Analysis of Existing Gravity Sewer

		Average day conditions				**Peak hour conditions**			
		Existing		**Proposed**		**Existing**		**Proposed**	
	Slope[24]	Flow (gpm)	d/D	Flow (gpm)	d/D	Flow (gpm)	d/D	Flow (gpm)	d/D
First segment	.0030	204	0.37	255	0.43	307	0.46	345	0.49
Second segment	.0031	204	0.37	262	0.43	307	0.46	387	0.53

[23] Existing Lift Station #3 dimensions and pump information provided via email by SMMWC. See appendix A-4
[24] Gravity sewer size and slope information taken from GIS model provided by SMMWC.

Industry standard for a 10-inch gravity sewer is to maintain below a 0.50 d/D. Based on this analysis, while existing gravity sewer does not meet the design standard d/D of 0.50 under peak hour conditions, the sewer main given a d/D of 0.53 is not close to surcharging or spilling under the peak hour conditions. Therefore, this analysis does not include any recommendations for upgrading the existing gravity sewer.

Wastewater Beneficial Reuse

As a potential source of additional water, the possibility exists that the beneficial reuse of SMMWC's treated wastewater could provide a number of shareholder benefits including meeting the Regional Water Quality Control Board's desire for such reuse subject to Waste Discharge Requirements. ABR's irrigation demand is currently met by its own irrigation facilities and the Cottage parcel anticipates utilizing SMMWC domestic water. Each can easily be provided treated effluent through a purple pipe system, much of which is existing.

SMMWC's wastewater is presently treated by the wastewater plant located in Wild Cherry Canyon. It is our understanding that the plant has the capacity for wet weather storage and has a secondary line which was a former force main through the Wild Cherry canyon the possibility exists that this unused former force main could be repurposed to convey properly treated effluent for irrigation use. This would necessitate upgrading the plant to produce effluent that could be used for irrigation. It is our understanding that ABR would be supportive of SMMWC efforts to build such a system and has signed an agreement with SMMWC to pursue beneficial reuse if SMWWC elects to upgrade its plant. ABR would be prepared to take treated waste water and blend it with well water to replace part of its current irrigation demand

ABR Independent System

In the unlikely event SMMWC is not able to pursue the upgrades necessary to its Wild Cherry Plant, ABR is willing to construct a 20,000 GPD onsite faculty that would allow ABR to achieve its own reuse and recharge onsite thereby reducing the irrigation demand from wells. The new facilities are designed to accommodate either option.

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Discussion of Flood Control Measures

The proposed water and sewer systems cross San Luis Creek in two locations. To reduce the potential risk of potable water loss and sewage spills caused by a flood event washing out the pipe crossings, a creek water level indicator will be incorporated in the SCADA system to serve two purposes:

1. Send alarms to the system operator as levels in the creek rise, giving the operator ample time to close water distribution system valves at the creek crossing locations.
2. Shut off the private lift stations, preventing pumping across the creek when water levels are high.

Enclosures:
Exhibit 1 – Avila Beach Resort Overview of New Units
Exhibit 2 – Avila Beach Resort Water System
Exhibit 3 - Avila Beach Resort Sewer System
Exhibit 4 – Proposed Sanitary Sewer Line Diagram
Exhibit 5 - Modified System Curve and Pump Duty Points
Appendix A-1 –1995 SMMWC Water and Wastewater Master Plan
Appendix A-2 – Water and Wastewater Master Plan Update May 2006
Appendix A-3 – Sewer Capacity Improvement Reimbursement Agreement (Resort Property)
Appendix A-4 – Email reference regarding existing water treatment, lift stations, and force mains
Appendix A-5 – Email reference regarding San Luis Bay Inn Force Main
Appendix A-6 – Agreement Regarding Additional Obligations Under Sewer Capacity Improvement Reimbursement Agreement (Resort Property)
Appendix A-7 - ABR Expansion of Facilities - Water Supply and Demand Evaluation – Wallace Group
Appendix A-8 - ABR State Water effective 3/4/1993, with Exhibit E attached (13.5 AF)
Appendix A-9 - EMOE State Water (6.78 AF)