



October 16, 2015

Mark Otto, Sr. Project Manager
Strandberg Custom Home & Design
P.O. Box 318
Anacortes, WA 98221

Subject: Rosario Resort Master Plan PUD Application #1 Validation Study – Water and Waste Water

Dear Mr. Otto:

Thank you for asking Washington Water Service Company (WWSC) to provide you and Rosario Resort with an assessment of the validity of the Rosario Resort Master Plan as it pertains to the existing water and waste water systems owned and operated by WWSC. This letter summarizes our understanding of conditions; a summary of findings; and conclusions based on those findings.

Background

Rosario Resort intends to move forward with implementation of the approved 2005 Rosario Resort Master Plan (RMP) approved under San Juan County Ordinance 11-2007. The RMP outlines the development to progress in two major phases, Phase I and Phase II. For the purpose of this evaluation, only Phase I will be evaluated.

Approach and findings

WWSC was contacted by John Hart, P.E. and he provided us with some background information and updated building areas (sq ft), occupancy unit counts and which portions of the expansion would be in Stage 1 or Stage 2 of Phase I, based on a chart, "Rosario Redevelopment Summary - Concept Plan", developed by GCH.

For the purposes of evaluating the water and wastewater systems, we used historical data as well as industry standards for estimating water uses for non-residential buildings and users, and then converted their estimated demands into something that was directly comparable to a typical residence's demands; these "units" are referred to as Equivalent Residential Units, or ERUs.

Although related, we evaluated the water and waste water systems separately and will discuss them separately in the evaluation that follows.

The following table is the basis of our evaluation of the proposed expansion and use:



Rosario Redevelopment Summary

CONCEPT PLAN

	Units	Approx. Building Area	Approx. Footprint (sf)	Community Open Space	Impervious Surfaces (ac)	Parking Stalls
TOTALS	159	297,795	117,410			319
Resort Units						
Vacation Rentals / Seasonal Units	99					
Employee Housing Units	60					
RESORT CORE AREA TOTALS	99	156,305	85,110	6.9	7.0	171
Resort Core_New Construction	97	112,790	70,595			
Redevelopment Stage - 1						
Moran Mansion & Cottages	59	85,155	41,715			62
Hotel Lodging Total	57	45,655	24,715			43
Rental Units	57	45,655	24,715			43
Mansion Cottages	19	14,250	10,260			14
Mansion Cottages_4 Flex	28	17,000	9,590			21
Mansion Cottages_8 Flex	8	6,000	3,000			6
Honeymoon Suite	1	715	930			1
Round House	1	915	915			1
*Moran Mansion Facilities Total	0	34,500	12,000			19
Hotel Dining		3,500				11
Bar		1,250				4
Kitchen		1,200				0
Meeting Space		1,000				3
Spa		2,500				3
Remaining Mansion Facilities		25,050				0
Whole Ownership	2	5,000	5,000			
Cliffhouse Court	2	5,000	5,000			
Marina Village West	21	27,950	19,395			42
Marina Village West Attached Vacation Units	9	13,500	7,225			18
Marina Village West Cottage Units	6	4,800	7,200			12
Marina Village West Cottage Units (2 story)	6	9,000	4,320			12
Lighthouse		650	650			
Redevelopment Stage 2						
Marina Village East	19	43,200	24,000			67
Marina Village East Lodging	19	33,900	17,900			38
Marina Village East Attached Vacation Units	16	26,400	13,200			32
Bowman's Bluff Ownership Units	3	7,500	4,700			6
Marina Village Cabana Facilities		9,300	6,100			29
Bar & Grill		1,500				5
Kitchen (Event & Bar)		1,000				0
Marina (Bathroom / Showers/Laundry)		800				0
Swimming Pool & Facilities		800				3
Wedding Event Space (200 seating)		3,200				16
Retail / Grocery		1,000				3
Storage		200				0
Marina Office		800				3
HILLTOP TOTALS	60	51,400	32,300	27.4 minimum	3.1	148
Hilltop_New Construction		44,100	25,000			
Resort Units						
Vacation Rentals / Seasonal Units	0					
Employee Housing Units	60	32,300	19,800			45
Existing Housing Units	20	7,300	7,300			
Proposed Housing Units	35	13,000	6,500			
Manager Cottages	5	12,000	6,000			
Recreation / Dining		7,200	3,600			
Maintenance / Laundry / Storage (Future Employee Building)		5,900	5,900			
Overflow parking		6,000	3,000			103

*Preliminary Program - TBC

Evaluation: Water System

The Rosario water system (and surface water treatment plant) is currently approved and certified to serve 643 ERUs. Currently the system has 115 ERUs available to sell to new customers, or to accommodate resort expansion(s). Because the resort plans on removing some building/dwelling units/etc, we set about comparing existing ERUs to the final number of proposed ERUs to determine a "net ERU gain" for each phase.

- In Stage 1, it was determined that the net ERU gain was approximately 24 ERUs, easily accommodated by the existing water system.
- In Stage 2, it was determined that the net ERU gain was approximately 67 ERUs.

Because so many of the proposed uses are atypical of a residential based water system, and so many assumptions had to be made to approximate potential water demands, a factor of safety was applied of 9 additional ERUs.

This brings the total net gain in ERUs for both Stages to 100 ERUs, which can be accommodated inside the existing system's approval.

New on-site water mains and service lines must be ran on the resort site to accommodate the expansion(s) and service the new proposed buildings. The RMP PUD Application #1 preliminary utility plans appear to address the infrastructure requirements for the Stage 1 and Stage 2 development. In addition, a distribution main extension, and booster station would need to be constructed to serve the proposed Hilltop Employee Housing expansion. The existing capacity of the source of supply facilities and existing water right quantities should be sufficient enough to accommodate the Resort's planned expansion.

Evaluation: Sewer System and Waste Water Treatment Plant (WWTP)

Using the net ERU gain analysis as described above, we also evaluated the waste water system. First, construction activities at the Resort will likely result in the relocation and/or upgrade of all three lift stations currently located on the Resort property along with associated sewer mains and building laterals. These could be accommodated with each stage of construction. Secondly, the existing WWTP treats the waste water from the existing resort along with a handful of single family residences, the waste water from Moran St Park, as well as the backwash (BW) and filter to waste (FTW) generated by the drinking water treatment plant, both of which go to the WWTP. It currently has a permitted capacity of 71,000 gallons per day based on a max month/average day. Estimated demand from all sources at the completion of Stage 1 and Stage 2 of the resort and service to approximately 30 single family residential (SFRs) is estimated at 118,586 gallons per day. These numbers are a blend of our numbers generated by our analysis and from Grey and Osbourne's (G&O) 2005 General Sewer Plan (they estimated a full build out of 137,000 gpd back in 2005).

Based on calculations of existing ERU's attributed to the resort, the peak season loading from Moran St Park, the projected loading from 30 SFRs and the projected BW and FTW volumes generated by the WTP, the existing WWTP cannot accommodate any expansion of the resort as max month loading would exceed the 71,000 gpd plant capacity.

However, a significant contributor to that loading is the FTW being sent from the WTP to the WWTP each time the WTP is called to run. At full build out of the WTP, on a peak day, it could be as much as 18,000 gpd. Washington Water is in the process of designing a way to recycle the FTW volume rather than send it downstream to the WWTP. After discussions with the WA State Department of Health Drinking Water Office, it appears that we can achieve a complete recycle of the FTW volume, eliminating it's loading on

the WWTP. The design for the FTW recycle is in progress and scheduled to be completed in the budget year 2015, with the construction scheduled for 2016.

Once this is achieved, and the FTW loading is removed from the WWTP, Rosario's Stage 1 improvements can be accommodated within the existing WWTP, with only a minor upgrade to the WWTP's chlorine contact chamber. This chamber will need to be enlarged to achieve the necessary contact time at the full plant capacity of 71,000 gpd (it's currently only sized to treat 60,350 gpd)

As outlined above, the planned expansion of Stage 1 could be accommodated by the existing WWTP (with the FTW recycle and contact chamber upgrades), but Stage 2 would require upgrades to the WWTP and issuance of a new NPDES permit (although related, two separate processes). G&O outlined a plan to upgrade the existing WWTP to bring its capacity to 137,000 gpd. Using mostly the existing lagoons and equipment, with only what could be considered as fairly minor alterations and equipment additions, all within the existing footprint of the WWTP. Further detail of the proposed WWTP expansion can be found in Chapter 7 of G&O's 2005 General Sewer Plan (GSP).

I recommend that if the resort wishes to pursue Stage 2 of the expansion that G&O be contracted to formally design and permit this proposed expansion. They estimated the cost to design and construct the recommended improvements (back in 2005) at approximately \$610,900 (all inclusive). The breakdown of this estimate can be found on page 7-25 of the 2005 GSP. It's possible that other alternatives may now exist to the upgrades outlined in the GSP, but they have not yet been explored at the time of this evaluation; the outlined upgrades are still viable.

Summary of Findings and Conclusions

The planned development of the Rosario Master Plan results in the net gain of approximately 100 ERUs to the water and waste water systems. The existing drinking water treatment plant and water rights are capable of accommodating both of the proposed Stages as outlined above. Certain sections of the distribution system, particularly on the resort site would require upgrades and/or reconfiguration to serve the proposed buildings. The required infrastructure improvements and upgrades appear to be accommodated in the PUD Application 1 preliminary utility plans. The net gain of 24 ERUs in Stage 1 can be accommodated by the existing WWTP, when the WTP filter to waste recycle project is completed along with upgrading the chlorine contact chamber as described. The ultimate net gain of 100 ERUs for both Stages cannot be accommodated by the existing WWTP, and it would require upgrades to accommodate the proposed expansion, as outlined above.

I trust that this comparative review provides you and Rosario Resort management with a clear understanding of the water and waste water elements associated with the proposed Master Plan, and the required upgrades associated with the WWTP to accommodate Phase II. If you or County staff have any question regarding the findings and conclusions developed in this review, I encourage you to contact me at your convenience at 360-491-3760.

Kind Regards,



Matthew D Brown, P.E.
Engineering Manager, WWSC

Cc: John Hart, Hart Pacific Engineering
Mike Ireland, Washington Water Service Company, President
Roy Stanton, WWSC Local Manager, Orcas Island Field Office