



# PROJECT DESCRIPTION – MALIBU VILLAGE PLAZA, MALIBU,

## *Producing Water Meeting CA Title 22 Unrestricted Water Reuse Standards Achieving Total Nitrogen <3 mg/l and Turbidity <2 NTU*

**Project:** Malibu Village Plaza  
Shopping Plaza

**Design Flow:** 16,000 gpd High Strength  
Equivalent to ~40,000 gpd  
Residential Strength Wastewater  
System – approximately 200  
homes

**Client:** Malibu Creek Preservation Co.  
c/o Soboroff Partners

**Wastewater  
Engineer:** Lombardo Associates, Inc.  
Malibu, CA & Boston, MA  
[www.LombardoAssociates.com](http://www.LombardoAssociates.com)



### **Project Description.**

The Malibu Village Plaza is a shopping plaza consisting of both retail and commercial businesses. It is located in an environmentally sensitive area adjacent to the famous Surfrider Beach in Malibu, California. In 1999 the California Regional Water Quality Control Board (CRWQCB) and the City of Malibu conducted groundwater and surface water sampling at Malibu Village Plaza and the nearby area and determined that wastewater discharge from the Plaza and other properties using conventional septic systems were causing groundwater pollution, which adversely impacted Malibu Creek and Malibu Lagoon.

Lombardo Associates, Inc. (LAI) was retained to engineer a compliant wastewater management system to protect Malibu Lagoon and Surfrider Beach. The previous system was a conventional system consisting of grease traps, septic tanks and gravel drainfields, which provided insufficient nitrogen and bacteria removal.

LAI designed a cost-effective wastewater management system that employs a septic tank effluent pump (STEP) collection system and treatment system consisting of the Nitrex™ Nitrogen Removal Technology, recirculating media pretreatment of septic tank effluent, and an ozone – UV disinfection system for bacteria removal. Treated effluent is discharged to new high capacity drainfields. The treatment system was designed to treat 16,000 gpd of the high strength wastewater (equivalent to ~40,000 gpd of residential strength wastewater) as 85% of the flow was from the Plaza's popular restaurants.



The Malibu Village Plaza Wastewater Treatment System has been operational as of July 2007. The Plaza's wastewater treatment effluent quality is compliant with permit requirements as well as California Title 22 unrestricted water reuse requirements as shown on the following table.

Energy use, 67% of which is for disinfection, of the high strength 16,000 gpd facility (equivalent to 200 - 250 homes) is approximately \$7,400 per year (135 kwhr/day @\$0.15). Operation & Maintenance requirements are monthly visits.

### Water Quality Data – Nitrex™ Wastewater System – Malibu Village Plaza, Malibu, CA

	Constituent	Average Flow	pH	TSS	BOD <sub>5</sub>	Turbidity	Total Coliform	Fecal Coliform	Enterococcus	Oil & Grease	TDS	Chloride	Boron	Sulfate	TN
	Units	gpd		mg/l	mg/l	NTU	MPN/100 ml	MPN/100 ml	MPN/100 ml	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
Malibu Creek Plaza	Avg			30	30	10.0		-	24	-	-	-	-	-	10.00
Effluent Standards	Max			45	45	15.0		200	104	15	2,000	500		500.0	10.00
Title 22	Avg					2.0	2.2								10.0
Unrestricted Reuse	Max					10.0	23								10.0
Sept. 2007		11,778	6.6	3.2	4.9	1.76	<2	<2	<1	<5	596	241		66	5.79
Oct. 2007		11,950	6.3	<5	6.9	1.08	<2	1	<1	<5	432	165		90	4.71
Nov. 2007		11,692	6.9							<5	540	212	0.31	59	3.23
Dec. 2007		11,692	6.2	9.0	12.0	1.80	8	2	<1	<5	688	270	0.24	62	3.57
Jan. 2008		9,680	6.4	<5	6.0	1.10	50	<2	<1	<5	604	162	0.21	50	4.73
Feb. 2009		9,893	6.2	<5	<5	5.40	<2	<2	<1	<5	684	226	0.23	68	5.61
Mar. 2008		9,808	6.5	<5	<5	1.90	<2	<2	<1	<5	720	213	0.27	98	6.72
Apr. 2008		10,238	6.4	7.0	<5	2.60	23	23	1	<5	660	205	0.34	87	9.17
May 2008		9,475	6.6	<5	<5	1.80	1600 *	350 *	46	<5	748	235	0.26	81	7.88
June 2008		9,996	6.7	8.0	<5	1.40	22	11	11	<5	776	296	0.32	132	15.91
July 2008		11,057	6.8	6.0	<5	1.40	<2	<2	<2	<5	652	167	0.44	82	9.46
Aug. 2008		10,255	6.9	<5	5.3	1.73	533	140	<1	<5	620	149	0.27	110	6.22
Sept. 2008		9,086	6.9	<5	5.0	4.50	<2	<2	1	<5	760	224	0.33	85	6.50
Oct. 2008		9,193	6.8	<5	<5	1.00	30	<2	<1	<5	776	297	0.00	151	3.17
Nov. 2008		9,734	6.9	<5	<5	3.70	<2	<2	<1	<5	772	296	0.34	81	3.74
Dec. 2008		9,153	6.8	<5	<5	0.20	<2	<2	1	<5	736	308	0.44	81	3.54
Jan. 2009		8,094	6.6	6.0	<5	0.20	23	<2	<1	7.00	752	330	0.43	97	2.68
Feb. 2009		6,216	6.9	<5	<5	1.45	<2	<2	<1	<5	884	360	0.47	93	2.84
Mar. 2009		6,429	7.0	<5	<5	0.46	4	3	<1	<5	896	290	0.43	115	2.11
Apr. 2009 **		5,649	6.7	12.5	14.4	11.28	813	806	1	<5	1,012	365	0.52	146	10.12
May. 2009		5,258	7.0	6.3	<5	1.78	63	<2	2	<5	1,030	1,240	0.58	384	3.22
June 2009		7,139	7.0	<5	<5	0.78	<2	<2	<1	4.63	916	325	0.53	101	1.95
July 2009		6,372	7.6	<5	<5	0.38	<2	<2	1	<5	744	275	0.54	126	1.33
August 2009		6,986	6.9	3.7	<5	0.30	<2	<2	<1	<5	778	230	0.55	86	1.09
September 2009		6,938	6.9	<5	7.3	0.23	<2	<2	<1	<5	756	241	0.54	98	1.42
October 2009		6,178	6.9	3.0	7.1	0.60	<2	<2	1	<5	744	225	0.97	97	0.96
November 2009		5,247	6.8	<5	5.4	0.45	2.8	<2	1	<5	692	227	0.80	83	1.29
December 2009		5,289	6.7	6.9	<5	0.28	<2	<2	92	<5	776	244	0.90	72	0.82
January 2010		5,799	7.0	<5	<5	0.55	13.0	<2	<1	<5	736	385	0.89	82	1.33
February 2010		5,365	7.2	<5	<5	0.63	<2	<2	<1	<5	836	352	0.86	100	1.36
March 2010		6,080	7.4	<5	<5	0.35	<2	<2	<1	<5	1,028	427	1.19	192	2.21
April 2010		6,194	6.0	<5	<5	0.29	<2	<2	<1	<5	840	302	1.17	80	1.73
Average from 9/1/07		8,247	6.8	3.7	3.7	1.67	100	59	3.8	2.7	756	296	0.51	104	3.48
Average from 10/1/08 after Equipment Repairs		6,701	6.9	3.7	3.8	1.31	51	82	5.5	2.8	827	354	0.64	119	2.40
Average from 10/1/08 excluding Operator error data		6,701	6.9	3.4	3.1	0.74	7.8	1.2	5.5	2.8	827	354	0.64	119	1.89

Notes: (\*) Electrical equipment malfunction (\*\*) Operator Error

Environmental Engineers/Consultants

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An additional 125 chemicals are analyzed on a monthly basis. All are within permit requirements. All contaminants of concern are below Detection Limits, typically 5 ppb.