Appendix I:

VTTM 5928 – River Rock (1226 Ojai Road)
Post-Development Sewer Capacity Analysis,
Southland Civil Engineering & Survey, LLP, June 12, 12014

SOUTHLAND CIVIL ENGINEERING & SURVEY, LLP

ENGINEERING DONE RIGHT ... FROM THE START

June 12, 2014

Mr. Stratis Perros
Deputy Planning Director
City of Santa Paula
970 Ventura Street
Santa Paula, CA 93061

(Submitted via e-mail)

Re.: VTTM 5928 – River Rock (1226 Ojai Road)
Post-development Sewer Capacity Analysis
Parallel Pipes in Ojai Road north of Richmond Road

The River Rock project, located at the site referenced above is a 55 lot single family subdivision with the existing Victorian style "Hardison House" to remain. The City of Santa Paula has requested that we verify the capacity of the sewer to reflect the increased flow from the net total of 54 new residential lots being added to the wastewater system. The wastewater flow from TTM 5928 is proposed to discharge to the existing 8-inch sewer main along Ojai Road. The sewer flows southerly to Harvard Boulevard and then westerly to the treatment plant. The existing 8-inch main in Ojai Road splits into 6-inch and 8-inch parallel lines just south of Say Road. The second of the two parallel lines was constructed for capacity relief of the first. At the direction of Randy Toedter, City's Consulting Engineer, flow depth analyses were performed for these sections of parallel pipes from Say Road to Richmond Road.

Exhibit 'A' shows the existing sewer main and design flow information along the study section.

Exhibit 'B' shows the Design Criteria used and the tabulation of the flow depth analyses.

The existing sewer manhole reference numbers and pipe slopes are based on the City Sewer Master Plan, while the wastewater flow design criteria are based on the 2012 Wastewater System Master Plan (Amendment to the Wastewater Master Plan, 2005).

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Both the existing and proposed flow rates of the Peak Dry Weather Flow (PDWF) and Peak Wet Weather Flow (PWWF) are presented on the table for comparison. For PDWF design, the maximum allowable flow depth is 50% full and for PWWF design, the maximum allowable flow depth is 75% full. The allowable flow rates at the 50% full and 75% full are also tabulated for comparison.

In conclusion, all the design flows in the section of pipes within this study are below the allowable flow depth and therefore, enough capacity is available for the proposed flow from the proposed development of Vesting Tentative Tract 5928, the River Rock project.

Please do not hesitate to contact me with any questions you may have. Thank you.

Sincerely,

Larry L. Mar, P.E./P.L.S.
Partner

Attach: Exhibit 'A' - Existing Sewer Main along Ojai Road
Exhibit 'B' – Flow Depth Analyses

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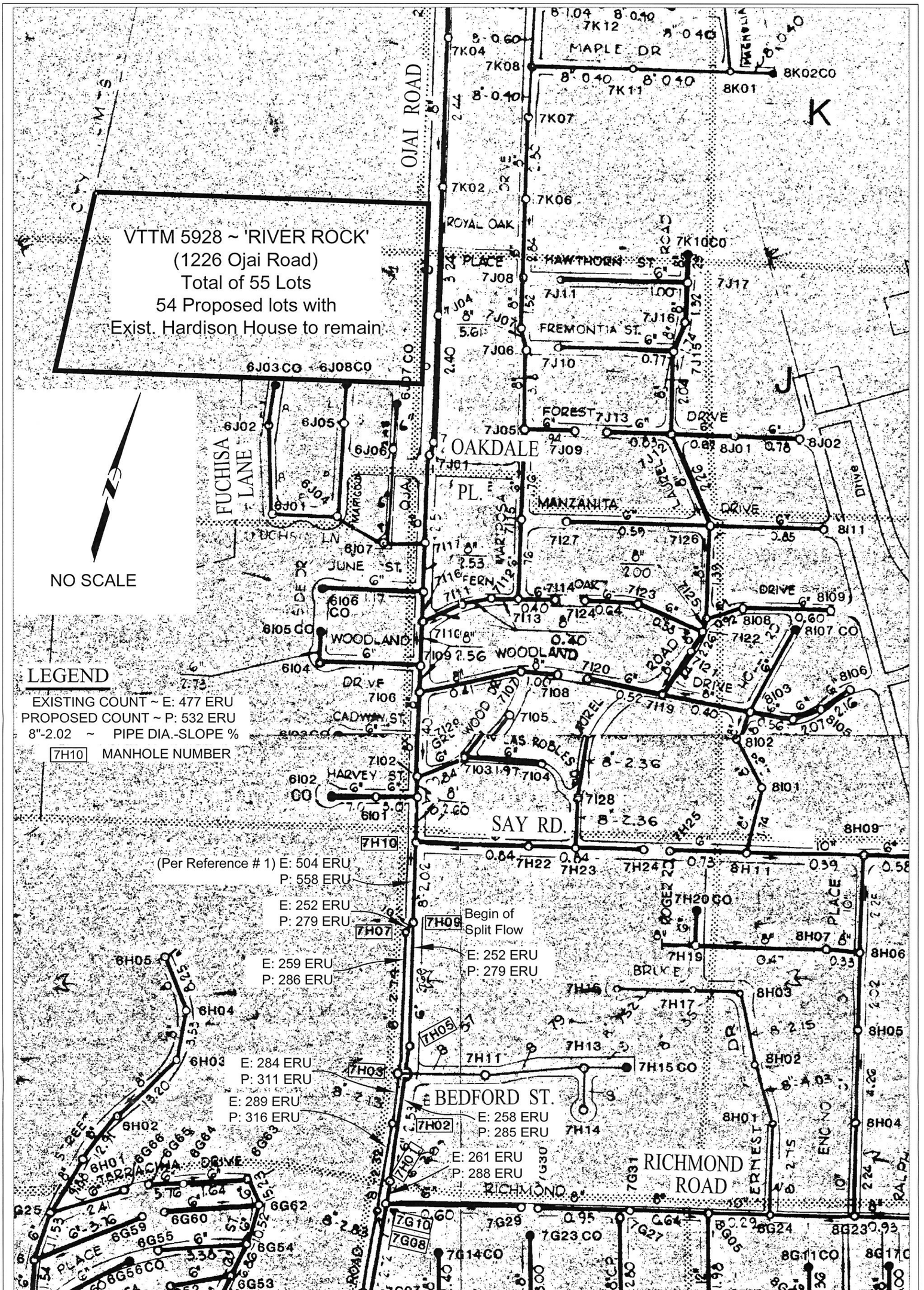

NOTE:
EXISTING COUNTS OF EQUIVALENT RESIDENTIAL UNITS (ERU) ARE BASED ON THE 2012 WASTEWATER SYSTEM MASTER PLAN.
(SEE EXHIBIT 'C')

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EXHIBIT 'A'

EXISTING SEWER MAIN ALONG OAJI ROAD
FOR
TENTATIVE TRACT MAP 5928

DATE: 2014-06-09
PROJ. NO.: 600-13010
SHEET: 1 of 1

EXHIBIT 'B' - FLOW DEPTH ANAYLSES

Sewer Flow Calculation Design criteria: (Per Reference #1)

Person per Equivalent Residential Unit (ERU) =	3.5	person	
Average Daily Flow per Capita Generation =	85	gpd	
Average Daily Flow Generation per ERU =	297.5	gpd	
=	0.00046	cfs	
Peak Flow Multiplier from Average Daily Flow:			
Peak Dry Weather Flow (PDWF) Multiplier =	2		(Max. allowable pipe flow depth at 50%)
Peak Wet Weather Flow (PWWF) Multiplier =	3		(Max. allowable pipe flow depth at 75%)
Manning Coeff. (n) =	0.012		

The TTM 5928 is a 55 lots development that includes an existing residential house to remain.
The total proposed net increase is 54 ERU. Existing ERU counts from Reference #1.

Reference:

1. City of Santa Paula Wastewater System Master Plan; June 2012
   (Amendment to Wastewater Master Plan, 2005)

Estimated wastewater flow conditions along Ojai Road, from TTM 5928 south to Richmond Road

Manhole No.	Slope (ft/ft)	Existing Condition					Proposed Condition					Allowable	
		ERU	PDWF (cfs)	PDWF (d/D ratio)	PWWF (cfs)	PWWF (d/D ratio)	ERU	PDWF (cfs)	PDWF (d/D ratio)	PWWF (cfs)	PWWF (d/D ratio)	50% Full (cfs)	75% Full (cfs)
7H10	Existing ERU = 504 per Ref. #1 (See Attachment C); Proposed addition from TTM 5928 = 54 ERU for a total of 558 ERU												
D=8"	0.0202	504	0.464	0.34	0.696	0.42	558	0.514	0.36	0.771	0.45	0.930	1.697
7H09	**At Say Road, begin of parallel pipes south of MH# 7H09 (8" pipe and 6" pipe, 50% split flow to each pipe is used)**												
7H09	ERU for split flow = 50% of 504 ERU (Existing) & 50% of 558 ERU (Proposed)												
D=10"	0.0202	252	0.232	0.18	0.348	0.22	279	0.257	0.19	0.385	0.23	1.687	3.076
7H07													
D=8"	0.0274	259	0.238	0.22	0.358	0.28	286	0.263	0.24	0.395	0.29	1.083	1.976
7H03													
D=8"	0.0213	284	0.261	0.25	0.392	0.31	311	0.286	0.26	0.429	0.32	0.955	1.742
7H02													
D=8"	0.0232	289	0.266	0.25	0.399	0.30	316	0.291	0.26	0.436	0.32	0.997	1.818
7G08	**At Richmond Road**												

Manhole No.	Slope (ft/ft)	Existing Condition					Proposed Condition					Allowable	
		ERU	PDWF (cfs)	PDWF (d/D ratio)	PWWF (cfs)	PWWF (d/D ratio)	ERU	PDWF (cfs)	PDWF (d/D ratio)	PWWF (cfs)	PWWF (d/D ratio)	50% Full (cfs)	75% Full (cfs)
7H09	ERU for split flow = 50% of 504 ERU (Existing) & 50% of 558 ERU (Proposed)												
D=6"	0.0268	252	0.232	0.33	0.348	0.41	279	0.257	0.35	0.385	0.43	0.498	0.907
7H05													
D=6"	0.0253	258	0.238	0.34	0.356	0.42	285	0.262	0.36	0.394	0.45	0.483	0.882
7H01													
D=6"	0.0207	261	0.240	0.36	0.360	0.45	288	0.265	0.38	0.398	0.47	0.437	0.797
7G10	**At Richmond Road**												

The slope for the 10" pipe between 7H09 and 7H07 is assumed to be the same as the upstream 8" pipe at s=0.0202.

(Reference : City of Santa Paula Wastewater System Master Plan; June 2012)

City of Santa Paula

Table 6-3
Existing Conditions - Wet Weather

Flow Calculation Data		
Persons Per Household =	3.5	
Per Capita Generation =	85	gpd
Generation Per Household =	297.5	gpd
=	0.00046	cfs
Peaking Factor =	3	
Peaked Generation =	0.001381	cfs
Manning's 'n' =	0.011	

ERU Count	
Zone 1	530
Zone 2	598
Zone 3	1020
Zone 4	623
Zone 5	391
Zone 6	215
Zone 7	146
Zone 8	365
Zone 9	416
Zone 10	546
Zone 11	647
Zone 12	515
Zone 13	57
Zone 14	375
Zone 15	336
Zone 16	298
Zone 17	504
Total =	**7582**

Collection Zone	FROM MH #	TO MH#	Pipe Dia. (in.)	Slope (ft/ft)	3/4 Full Capacity- (cfs)	ERU's Served at Capacity	ERU's Served	Contributing Zones	Peaked Flow Rate (cfs)	Percent Full
17	7H10	7H09	8	0.0202	1.697	1228	504	17	0.696	< 75%
17	7I01	7H10	8	0.0260	1.925	1393	465		0.642	< 75%
17	7H22	7H10	6	0.0084	0.508	367	27		0.037	< 75%
17	7I17	7I16	8	0.0253	1.899	1375	465		0.642	< 75%
16	8G05	8G03	12	0.0198	4.953	3586	298	16	0.412	< 75%
16	8G24	8G05	10	0.0029	1.166	844	283	.95*16	0.391	< 75%
16	8H11	8H09	10	0.0039	1.352	979	179	.6*16	0.247	< 75%
15	7E11	7E04	8	0.0220	1.771	1282				
15	7E09	7E03	8	0.0193	1.658	1200				
15	**Parallel Pipes**		8		3.429	2482	840	15+17	1.160	< 75%
14	7D28	7D26	12	0.0032	1.991	1441	673	14+16	0.929	< 75%
13	7C15	7C14	8	0.0040	0.755	546	57	13	0.079	< 75%
12	6E11	6E12	10	0.0171	2.830	2049	515	12	0.711	< 75%
11	5D30	5D29	18	0.0020	4.641	3360	2002	11+12+(15+17)	2.765	< 75%
11	6D20	6D19	18	0.0012	3.595	2603	1970	(.95*11)+12+(15+17)	2.720	< 75%
11	6D29	6D20	12	0.0015	1.363	987	615	.95*11	0.849	< 75%
11	7D25	7D24	10	0.0040	1.369	991	582	.90*11	0.804	< 75%
10	5E19	5E14	8	0.0028	0.632	457	191	.35*10	0.264	< 75%
10	5E10	5E14	8	0.0084	1.094	792	246	.45*10	0.339	< 75%
10	5E16	5E17	8	0.0116	1.286	931	546	10	0.754	< 75%
9	4D34	4D33	8	0.0200	1.688	1222	962	9+10	1.329	< 75%
9	4D36	4D34	8	0.0134	1.382	1000	374	.9*9	0.517	< 75%
9	4E01	4D36	8	0.0143	1.428	1034	374		0.517	< 75%
9	4E05	4E01	8	0.0156	1.491	1079	374		0.517	< 75%
9	4E06	4E05	8	0.0050	0.844	611	354	.85*9	0.488	< 75%
8	4D06	4D09	20	0.0008	3.887	2815	3329	8+9+10+11+12+15+17	4.597	> 75%
8	4D26	4D27	15	0.0020	2.854	2066	1017	(.15*8)+9+10	1.404	< 75%
8	4D27	4D06	15	0.0020	2.854	2066	1017		1.404	< 75%
8	4D32	4D31	12	0.0076	3.068	2222	999	(.1*8)+9+10	1.379	< 75%
8	5D04	4D07	18	0.0009	3.113	2254	2258	(.7*8)+11+12+15+17	3.118	> 75%
8	5D22	5D05	18	0.0008	2.935	2125	2239	(.65*8)+11+12+15+17	3.092	> 75%
7	5C07	5C05	18	0.0032	5.870	4251	876	7+13+(14+16)	1.210	< 75%
7	7C14	7C13	18	0.0056	7.766	5623	730	13+(14+16)	1.008	< 75%
7	7C13	7C07	18	0.0030	5.684	4116	730		1.008	< 75%
6	2F01	2E48	8	0.0103	1.212	877	215	6	0.297	< 75%
5	2E42	2E34	10	0.0200	3.061	2216	391	5	0.540	< 75%
5	2E45	2E43	8	0.0040	0.755	546	91		0.126	< 75%
5	2E40	2E42	8	0.0035	0.706	511	276		0.381	< 75%
4	2D43	2D44	10	0.0025	1.082	783	1229	4+5+6	1.697	> 75%
4	2D42	2D43	10	0.0025	1.082	783	1229		1.697	> 75%
4	2E04	2D42	10	0.0025	1.082	783	1229		1.697	> 75%
4	2E05	2E04	10	0.0025	1.082	783	1229		1.697	> 75%
4	2E06	2E05	8	0.0094	1.157	838	500	(.3*4)+(.25*5)+6	0.690	< 75%
4	2E12	2E06	8	0.0086	1.107	801	500		0.690	< 75%
4	2D08	2E05	10	0.0025	1.082	783	827	(.7*4)+5	1.142	> 75%
4	2E17	2D08	10	0.0025	1.082	783	827		1.142	> 75%
3	2C15	2C14	24	0.0021	10.241	7416	5578	3+4+8	7.703	< 75%
3	3D19	3D20	24	0.0010	7.067	5117	4298	(.95*3)+8	5.936	< 75%
3	2D49	2D51	24	0.0010	7.067	5117	5527	(.95*3)+4+8	7.633	> 75%
3	3D21	3D18	8	0.0060	0.925	669	816	.8*3	1.127	> 75%
3	2D45	2D46	10	0.0096	2.121	1535	1229	4+5+6	1.697	< 75%
2	1C04	1C08	15	0.0124	7.106	5146	598	2	0.826	< 75%
2	1D08	1D17	12	0.0066	2.859	2070	239	.4*2	0.330	< 75%
2	1D09	1D08	8	0.0058	0.909	658	179	.3*2	0.248	< 75%
2	1D10	1D09	8	0.0058	0.909	658	179	.3*2	0.248	< 75%
1	2C01	PLANT	36	0.0010	20.837	15088	7582	1+2+3+7	10.471	< 75%
1	3C04	3C03	21	0.0020	7.000	5069	1088	(.4*1)+7+13	1.503	< 75%
1	3C05	3C04	21	0.0013	5.644	4087	1088		1.503	< 75%
1	3C06	3C05	21	0.0020	7.000	5069	956	(.15*1)+7+13	1.320	< 75%

EXHIBIT 'C' - EXISTING CONDITIONS