Wastewater Calculations and Cost Estimates
Truckee Meadows

Truckee Meadows Water Reclamation Facility Treatment Cost

Treatment	City	County	Cost
Projected Incremental Treatment Cost of 46 MGD to 49.9 MGD	$55,800,000	$2,700,000	$58,500,000
Engineering (20%)	$11,200,000	$500,000	$11,700,000
Contingency (20%)	$9,700,000	$2,000,000	$11,700,000
Total	**$76,700,000**	**$5,200,000**	**$81,900,000**

[1] Current plant expansion will increase treatment capacity to 46 MGD.

[2] Based on total existing flow of 29.3 MGD.

[3] Treatment cost based on $15 million per additional MGD treated.

[4] 20 Cities ENRCCI = 7,942 May 2007

City of Reno Capacity Improvement Budget

	Cost ($M)
2007-2013 Projects	
North Virginia S.S.	$38
Lakeside Trunk Replacement	$3
Grove St. S.S.	$24
Lawton Verdi Interceptor	$7
S. Virginia Trunk Capacity Upgrade	$6
Hunter Lake Trunk Replacement	$1
Plumb/Virginia Capacity Improvement	$14
Total	$93

TRUCKEE MEADOWS INTERCEPTOR AND FORCE MAIN CALCULATIONS

Reach #	Length (ft)	Min. Diameter (in)	Max. Diameter (in)	Slope (ft/ft)	Upstr Q (MGD)	Q In (MGD)	Q Total (MGD)	Min. Capacity 0.5 d/D (MGD)	Max. Capacity 0.5 d/D (MGD)	70% Avg. Capacity	Velocity (fps)	Additional Capacity Required	Required Diameter	Capacity 0.5 d/D	Collection Areas and Comments
A	11000	24	24	0.006595		8.81	8.81	5.53	10.02	8.90	5.4				TM 20, WC 1, WC 2, SC 1
B	22411	24	30	0.006595	8.81	0	8.81	5.53	10.02	8.90	5.4			0.00	Pipe A
1	10792	24	30	0.005902	8.81	0.47	9.28	5.23	9.48	**8.42**	5.2	0.86	14	1.24	Pipe B, TM 19
2	11118	15	18	0.032954		2.41	2.41	3.53	5.74	5.18	8.9			0.00	50% - TM 17
3	12283	24	33	0.005116	11.69		11.69	4.87	11.38	**9.75**	4.8	1.94	18	2.26	Conveys pipes 1 & 2
3A	3726	36	36	0.002858		0.85	0.85	10.73	10.73	10.73	4.7				TM 18, WC 3
4	8042	15	24	0.029111		4.74	4.74	3.31	11.61	9.54	8.4			0.00	50% - TM 17, TM 16
5	8136	30	36	0.004971	17.28		17.28	8.70	14.15	**12.78**	5.5	4.49	24	4.80	Pipes 3, 3A & 4
6	8859	15	24	0.023301		3.26	3.26	2.97	10.39	8.53	7.5			0.00	TM 15
7	3113	39	42	0.005994	20.54		20.54	19.23	23.43	22.38	7.2			0.00	Pipes 5 & 6
8	9191	10	30	0.006187		3.01	3.01	0.52	9.70	7.41	2.9			0.00	TM13
9	729	30	32	0.007078	23.56		23.56	10.38	12.33	**11.84**	6.5	11.71	32	12.33	Pipes 7 & 8
9A	240	30	30	0.003917	11.78		11.78	7.72	7.72	**7.72**	4.9	4.06	24	4.26	50%-Pipe 9
9B	244	32	32	0.003852	11.78		11.78	9.10	9.10	**9.10**	5.0	2.68	24	4.22	50%-Pipe 9
10	4237	12	18	0.019061		3.40	3.40	1.48	4.36	3.64	5.8			0.00	TM 12
10A	7943	18	36	0.004218	3.40	3.53	6.94	2.05	13.03	10.29	3.6			0.00	Pipe 10, 35% TM1
11	1142	33	33	0.007234	11.78		11.78	13.53	13.53	13.53	7.1			0.00	Pipe 9A
11A	1160	32	32	0.007121	11.78		11.78	12.37	12.37	12.37	6.9			0.00	Pipe 9B
12	8804	36	42	0.004996	11.78	3.52	15.30	14.18	21.39	19.59	6.2			0.00	pipe 11, 50% TM 9
13	7007	24	36	0.002979	11.78	1.51	13.29	3.71	10.95	**9.14**	3.7	4.15	30	6.73	Pipe 11A, 15% TM1
14	4569	18	24	0.00583		3.53	3.53	2.41	5.20	4.50	4.2			0.00	35% TM 1
15	1640	18	24	0.000817	3.53	1.51	5.05	0.90	1.95	**1.68**	1.6	3.36	30	3.53	15% TM 1, Pipe 14
15A	1816	36	36	0.004526	11.98		11.98	13.50	13.50	13.50	5.9			0.00	Pipe 15, 10A
16	4922	15	24	0.002182		3.52	3.52	0.91	3.18	**2.61**	2.3	0.91	16	1.08	50% TM 9
17	2112	39	39	0.006817	18.83		18.83	20.51	20.51	20.51	7.7			0.00	Pipes 16 & 12
18	1419	39	39	0.011973	18.83		18.83	27.18	27.18	27.18	**10.1**			0.00	Pipe 17
19	9696	30	42	0.00602	25.27		25.27	9.57	23.48	**20.01**	6.0	5.27	24	5.28	Pipes 13 & 15
20	15047	12	27	0.008962		6.34	6.34	1.01	8.82	6.87	4.0			0.00	70% TM 2
21	2634	27	27	0.001708	6.34		6.34	3.85	3.85	**3.85**	3.0	2.49	24	2.81	Pipe 20
22	937	45	45	0.003073	25.17		25.17	20.17	20.17	**20.17**	5.7	5.00	30	6.84	Pipe 18 & 21
23	7216	Force Main				2.87	2.87								TM 4
24	19131	45	60	0.001915	28.04	2.72	30.75	15.92	34.29	**29.70**	4.5	1.06	18	1.38	Pipe 22 & 23, 30% TM 2
25	20049	15	18	0.025913		9.11	9.11	3.13	5.09	**4.60**	7.9	4.51	18	5.08	TM11
26	19266	18	42	0.004511	9.11	10.22	19.33	2.12	20.33	**15.78**	3.7	3.55	24	4.57	Pipe 25, TM 10, TM 22
28	7292	15	18	0.027934		2.71	2.71	3.25	5.28	4.77	8.2			0.00	TM 14
29	11936	18	48	0.019945	2.71	5.11	7.82	4.46	61.03	46.89	7.8			0.00	Pipe 28, TM 23, 50% TM 5
30	2577	36	36	0.009694		3.95	3.95	19.76	19.76	19.76	8.7			0.00	TM 6
31	2721	60	60	0.006916	11.77		11.77	65.17	65.17	65.17	**10.3**			0.00	Pipes 29 & 30
31A	7449	8	36	0.002801		2.23	2.23	0.19	10.62	8.01	1.7			0.00	50% TM 5
31B	1478	60	60	0.002429	13.99		13.99	38.62	38.62	38.62	6.1			0.00	Pipes 31 & 31A
31C	2023	18	24	0.007794		1.44	1.44	2.79	6.01	5.20	4.9			0.00	TM 7
32	1677	60	60	0.002916	15.43		15.43	42.31	42.31	42.31	6.7			0.00	Pipes 31B & 31C
33	10070	18	30	0.006105		2.61	2.61	2.47	9.64	7.85	4.3			0.00	TM 8, 50% WC 4
34	4550	48	60	0.001178	18.05		18.05	14.83	26.90	23.88	3.7			0.00	Pipes 32 & 33
35	7143	24	33	0.007199		2.78	2.78	5.77	13.50	11.57	5.7			0.00	25% TM 3, 50% WC 4
36	2615	18	24	0.002485		1.94	1.94	1.58	3.39	2.94	2.8			0.00	TM 21
37	9589	33	36	0.005344	4.72	2.47	7.20	11.63	14.67	13.91	6.1			0.00	Pipe 35 & 36, 25% TM 3
38	18561	54	72	0.000895	25.24	5.59	30.83	17.70	38.12	33.02	3.4			0.00	Pipes 34 & 37, 50% TM 3, WC 5
39	3244	72	72	0.001008	61.59		61.59	40.46	40.46	**40.46**	4.4	21.13	60	24.87	Pipes 24 & 38

Bold numbers represent where capacity criteria have been exceeded.

Data as provided by the City (July 2006) and County (March 2007)

TRUCKEE MEADOWS INTERCEPTOR COSTS									
INTERCEPTORS									
Pipe Segment	**Pipe (ft)**	**Diameter (In.)**	**County (mgd)**	**City (mgd)**	**Total Q**	**County % Flow**	**City % Flow**	**County Cost**	**City Cost**
A	11,000	24	1.32	7.95	9.28	14	86	$452,000	$2,716,000
1	10,792	14	1.32	7.95	9.28	14	86	$259,000	$1,554,000
3	12,283	18	1.32	10.37	11.69	11	89	$300,000	$2,353,000
5	8,136	24	1.91	15.37	17.28	11	89	$259,000	$2,084,000
9	729	32	1.91	23.56	25.47	8	92	$21,000	$259,000
9A	240	24	0.00	11.78	11.78	0	100	$0	$69,000
9B	244	24	0.00	11.78	11.78	0	100	$0	$70,000
13	7,007	30	0.00	13.29	13.29	0	100	$0	$2,522,000
15	1,640	30	0.00	5.05	5.05	0	100	$0	$590,000
16	4,922	16	0.00	3.52	3.52	0	100	$0	$945,000
19	9,696	24	0.00	25.27	25.27	0	100	$0	$2,793,000
21	2,634	24	0.00	6.34	6.34	0	100	$0	$759,000
22	937	30	0.00	25.17	25.17	0	100	$0	$337,000
24	19,131	18	0.00	30.75	30.75	0	100	$0	$4,132,000
25	20,049	18	0.00	9.11	9.11	0	100	$0	$4,331,000
26	19,266	24	0.00	19.33	19.33	0	100	$0	$5,549,000
39	3,244	60	1.26	60.33	61.59	2	98	$48,000	$2,288,000
Sub Total								**$900,000**	**$30,600,000**
Engineering (20%)								**$200,000**	**$6,100,000**
Contingency (20%)								**$200,000**	**$6,100,000**
Total								**$1,300,000**	**$42,800,000**

20 Cities ENRCCI = 7,942 May 2007

Data received from the City current as of July 2006

SUNNY HILLS INTERCEPTOR CALCULATIONS

Reach	Length (ft)	Diameter (in)	Slope (ft/ft)	Upstr Q (MGD)	Q In (MGD)	Q Total (MGD)	Capacity 0.5 d/D (MGD)	Velocity (fps)
A	4,177	8	0.0035	0.00	0.21	0.21	0.21	1.9
C	8,875	14	0.0035	0.21	0.65	0.86	0.96	2.8
FORCE MAIN								
B	4,176	6			0.21	0.21		1.7

SUNNY HILLS INTERCEPTORS, FORCE MAINS AND LIFT STATIONS COSTS

SUNNY HILLS			
INTERCEPTORS			
Pipe Segment	**Pipe (ft)**	**Diameter (In.)**	**Cost**
A	4,177	8	$401,000
C	8,875	14	$1,491,000
Sub Total	13,052		**$1,892,000**
WASTEWATER FORCE MAINS			
B	4,176	6	$301,000
Sub Total			**$301,000**
WASTEWATER LIFT STATION COSTS			**$320,000**
Total			**$2,513,000**

20 Cities ENRCCI = 7,942 May 2007

WASTEWATER LIFT STATION COSTS		
Force Main	**Total Q**	**Cost**
B	0.21	$320,000
Sub Total		**$320,000**

20 Cities ENRCCI = 7,942 May 2007