

**Wastewater Calculations and Cost Estimates**  
**Stead**

STEAD INTERCEPTORS AND FORCE MAIN CALCULATIONS													
NEW INTERCEPTORS												Notes	
Node Upstr	Pipe Segment	Pipe (ft)	Diameter (in.)	Slope (ft/ft)	Upstr Q (mgd)	Node Q (mgd)	Total Q	Capacity 0.5 d/D (mgd)	Velocity (fps)	Additional Capacity (mgd)	Required Diameter (in)		Capacity 0.5 d/D (mgd)
1	A	13,877	14	0.0040		1.00	1.00	1.02	3.0			0.00	Contribution from Collection Area 1.
2	B	10,448	20	0.0058	1.0000	1.64	2.64	3.19	4.5			0.00	Contribution from Node 1 and Collection Areas 8 & 9.
13	M	16,491	24	0.0050		3.18	3.18	4.81	4.7			0.00	Contribution from Collection Areas 2, 11, & 12. Includes 5778 ft of sewer in Collection Area 2.
14	N	7,000	20	0.0008		1.08	1.08	1.18	1.7			0.00	Contribution from Collection Area 12.
EXISTING INTERCEPTORS												Notes	
Node Upstr			Diameter (in.)	Slope (ft/ft)	Upstr Q (mgd)	Node Q (mgd)	Total Q	Capacity 0.5 d/D (mgd)	Velocity (fps)	Additional Capacity (mgd)	Required Diameter (in)		Capacity 0.5 d/D (mgd)
3	C	9,849	24	0.0030		3.50	3.50	3.73	3.7			0.00	Contribution from Collection Areas 4 & 10.
4	D	10,440	8	0.0187		2.08	2.08	<b>0.50</b>	4.4	1.6	14	2.21	Contribution from Collection Area 5. Includes 3463 ft of new pipe.
5	E	6,375	24	0.0010		2.46	2.46	<b>2.15</b>	2.1	0.3	12	0.34	Contribution from Collection Area 3. Assume 0.0010 slope.
6	F	844	24	0.0011		8.04	8.04	<b>2.26</b>	2.2	5.8	36	6.65	Contribution from Node 3, 4 & 5.
7	G	10,383	8	0.0060		2.08	2.08	<b>0.28</b>	2.5	1.8	18	2.45	Contribution from Collection Area 5.
8	H	2,065	24	0.0011		10.12	10.12	<b>2.26</b>	2.2	7.9	36	<b>6.65</b>	Contribution from Node 6 & 7. Assume 76% capacity to meet
9	I	1,044	36	0.0015		12.76	12.76	<b>7.77</b>	3.4	5.0	36	<b>7.77</b>	Contribution from Node 2 & 8. Assume 82% capacity to meet
10	J	18,092	21	0.0054	0.44	3.10	3.54	<b>3.50</b>	4.5			0.00	Contribution from Collection Areas 6 & 14. Includes 3600 ft of new pipe.
11	K	10,532	24	0.0006		1.55	1.55	1.67	1.6			0.00	Contribution from Collection Area 6. Includes 4847 ft of new pipe.
12	L	21,537	10	0.0003	2.61	0.40	3.01	<b>0.11</b>	0.6	2.9	36	3.47	Contribution from Collection Areas 7 & 13.
NEW FORCE MAIN												Notes	
	O	9,590	14				2.64		3.8				
	P	14,589	14				3.18		4.6				
	Q	5,358	12				1.96		3.9				
	R	1,216	16				3.54		3.9				
	S	11,460	16				4.10		4.5				
	T	4,407	8				1.08		4.8				

Bold numbers represent where capacity criteria have been exceeded.  
Data received from the City current as of July 2006

<b>NEW STEAD INTERCEPTORS, FORCE MAINS, AND LIFT STATION COSTS</b>									
<b>INTERCEPTORS</b>									
<b>Pipe Segment</b>	<b>Pipe (ft)</b>	<b>Diameter (In.)</b>	<b>County (mgd)</b>	<b>City (mgd)</b>	<b>Total Q</b>	<b>County % Flow</b>	<b>City % Flow</b>	<b>County Cost</b>	<b>City Cost</b>
A	13,877	14	0.00	1.00	1.00	0	100	\$0	\$2,331,000
B	10,448	20	1.52	1.12	2.64	58	42	\$1,443,000	\$1,064,000
M	16,491	24	1.22	1.96	3.18	38	62	\$1,822,000	\$2,927,000
N	7,000	20	1.08	0.00	1.08	100	0	\$1,680,000	\$0
D	10,440	14	0.00	2.08	2.08	0	100	\$0	\$1,754,000
E	6,375	12	0.00	2.46	2.46	0	100	\$0	\$918,000
F	844	36	0.20	7.84	8.04	2	98	\$9,000	\$356,000
G	10,383	18	0.00	2.08	2.08	0	100	\$0	\$2,243,000
H	2,065	36	0.20	9.92	10.12	2	98	\$18,000	\$874,000
J	3,600	21	0.44	3.10	3.54	12	88	\$113,000	\$794,000
K	4,847	24	0.00	1.55	1.55	0	100	\$0	\$1,396,000
L	21,537	36	0.40	2.61	3.01	13	87	\$1,236,000	\$8,068,000
<b>Sub Total</b>	<b>107,907</b>							<b>\$6,300,000</b>	<b>\$22,700,000</b>
<b>FORCE MAINS</b>									
O	9,590	14	1.52	1.12	2.64	58	42	\$927,000	\$684,000
P	14,589	14	1.22	1.96	3.18	38	62	\$940,000	\$1,511,000
Q	5,358	12	0.00	1.96	1.96	0	100	\$0	\$772,000
R	1,216	16	0.44	3.10	3.54	12	88	\$29,000	\$205,000
S	11,460	16	1.48	2.61	4.09	36	64	\$796,000	\$1,404,000
T	4,407	8	1.08	0.00	1.08	100	0	\$423,000	\$0
<b>Sub Total</b>	<b>46,619</b>							<b>\$3,100,000</b>	<b>\$4,600,000</b>
<b>LIFT STATIONS</b>									
O	9,590	14	1.52	1.12	2.64	58	42	<b>\$651,000</b>	<b>\$480,000</b>
P	14,589	14	1.22	1.96	3.18	38	62	<b>\$503,000</b>	<b>\$807,000</b>
Q	5,358	12	0.00	1.96	1.96	0	100	<b>\$0</b>	<b>\$903,000</b>
R	1,216	16	0.44	3.10	3.54	12	88	<b>\$178,000</b>	<b>\$1,252,000</b>
S	11,460	16	1.48	2.61	4.09	36	64	<b>\$584,000</b>	<b>\$1,030,000</b>
T	4,407	8	1.08	0.00	1.08	100	0	<b>\$610,000</b>	<b>\$0</b>
<b>Sub Total</b>	<b>46,619</b>							<b>\$2,530,000</b>	<b>\$4,470,000</b>
<b>Total</b>								<b>\$12,000,000</b>	<b>\$31,800,000</b>
<b>Engineering (20%)</b>								<b>\$2,400,000</b>	<b>\$6,400,000</b>
<b>Contingency (20%)</b>								<b>\$2,400,000</b>	<b>\$6,400,000</b>
<b>Total</b>								<b>\$16,800,000</b>	<b>\$44,500,000</b>

20 Cities ENRCCI = 7,942 May 2007

Data received from the City current as of July 2006

**Stead Treatment Cost and Flow Allocations**

**Stead - Treatment Costs**

Treatment (Membrane/UV)	Cost	Date	ENR
Projected Incremental Tertiary Treatment Cost 2 to 4.8MGD	\$26,414,000	Apr-05	7355
Additional Ozone Treatment	\$8,270,000	Apr-05	7355
Adjusted Treatment Volume 4.8 to 7.20MGD	\$46,067,000	Apr-05	7355
Adjusted Treatment Volume 4.8 to 7.20MGD	\$49,700,000	May-07	7942
Engineering (20%)	\$9,900,000		
Contingency (20%)	\$9,900,000		
<b>Total</b>	<b>\$69,500,000</b>		

20 Cities ENRCCI = 7,942 May 2007

**Stead-Cold Springs Flow Allocations**

	Total 2030 Capacity (MGD)	Total Existing Capacity (MGD)	Total New Capacity (MGD)	Regional Facilities (%)	2030 County Capacity (MGD)	Existing County Capacity (MGD)	New County Capacity (MGD)	2030 City Capacity (MGD)	Existing City Capacity (MGD)	New City Capacity (MGD)	County %	City %
RSWRF	7.2	2.35	4.85	59.5%	2.75	0	2.75	4.45	2.35	2.1	56.7%	43.3%
CSWWTP	4.5	0.7	3.8	43.9%	1.4	0.7	0.7	3.1	0	3.1	18.4%	81.6%

20 cities ENRCCI = 7,942 May 2007

**Stead Regional Reservoir and Long Valley Export Costs**

**Reservoir - Regional Disposal/Reclaimed Water Costs**

Facility	Length (ft)	Diameter		Subtotal
		(ft)	(in)	
Stormwater Bypass	5,500		36	\$1,188,000
Dam/Earthwork				\$4,573,000
Subtotal				\$5,800,000
Engineering (20%)				\$1,200,000
Contingency (20%)				\$1,200,000
<b>Total</b>				<b>\$8,200,000</b>

20 Cities ENRCCI = 7,942 May 2007

**Long Valley Export - Regional Disposal/Reclaimed Water Costs**

Facility	Length (ft)	Diameter		Pump Q (MGD)	Subtotal
		(ft)	(in)		
Discharge Piping	33,000		24		\$9,504,000
Pump Station				5	\$1,900,000
Whites Lake Disposal	1,800		16		\$345,600
<b>Total</b>					<b>\$11,400,000</b>
Engineering (20%)					\$2,300,000
Contingency (20%)					\$2,300,000
<b>Total</b>					<b>\$16,000,000</b>

20 Cities ENRCCI = 7,942 May 2007

**Stead-Cold Springs Regional Disposal/Reclaimed Water Costs**

Regional Facilities	Cost	Stead			Cold Springs		
		Total	City	County	Total	City	County
Reservoir	\$8,200,000	\$4,600,000	\$2,000,000	\$2,600,000	\$3,600,000	\$2,900,000	\$700,000
Long Valley Creek Disposal	\$16,000,000	\$9,000,000	\$3,900,000	\$5,100,000	\$7,000,000	\$5,700,000	\$1,300,000
<b>Total</b>	<b>\$24,200,000</b>	<b>\$13,600,000</b>	<b>\$5,900,000</b>	<b>\$7,700,000</b>	<b>\$10,600,000</b>	<b>\$8,600,000</b>	<b>\$2,000,000</b>

[1] Based on percent-flow allocations (See Appendix)

20 Cities ENRCCI = 7,942 May 2007

**Stead Regional Reclaimed Water Costs**

**Stead - Reclaimed Water Costs**

<b>Facility</b>	<b>Length (ft)</b>	<b>Diameter (in)</b>	<b>Pump Q<sub>peak</sub> (MGD)</b>	<b>Subtotal</b>
Distribution Piping	12,500	6		\$900,000
	11,700	8		\$1,123,000
	12,800	10		\$1,536,000
Pipe to Reservoir	38,500	24		\$11,088,000
Pump Station [4]			4.85	\$1,900,000
2 MG Storage Tank				\$2,000,000
Subtotal				\$18,500,000
Engineering (20%)				\$3,700,000
Contingency (20%)				\$3,700,000
<b>Total</b>				<b>\$25,900,000</b>

[1] Pump to serve for expanded reuse distribution and supply to reservoir  
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