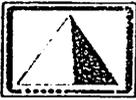


## **BACT Attachment A**

### **Eichleay Estimates for Fermentation Controls at Gallo Livingston**



Eichley Engineers Inc. of California

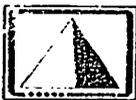
**ESTIMATE SUMMARY SHEET**

Client Name: Wine Institute Estimated By: P.H.M.  
 Job Number: 30913 **PRELIMINARY ESTIMATE** Checked By: R.H.  
 Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	W/O ESCALATION & OWNERS COSTS				GRAND TOTAL
		RTO-1	RTO-2	RTO-3	RTO-4	
<b>SUMMARY</b>						
2.00	Site Construction	\$1,253,680	\$5,450	\$5,450	\$5,450	\$1,270,030
3.00	Concrete	\$208,450	\$81,500	\$85,500	\$69,500	\$444,950
4.00	Masonry					\$0
5.00	Metals	\$1,499,010	\$395,028	\$361,670	\$275,846	\$2,531,554
6.00	Wood & Plastics					\$0
7.00	Thermal & Moisture Protection					\$0
8.00	Door & Windows					\$0
9.00	Finishes					\$0
10.00	Specialties	\$8,620	\$0	\$0	\$0	\$8,620
11.00	Equipment					\$0
12.00	Furnishings					\$0
13.00	Special Construction					\$0
14.00	Conveying Systems					\$0
15.00	Mechanical HVAC & Plumbing					\$0
16.00	Electrical	\$116,439	\$28,212	\$27,326	\$32,226	\$204,203
17.00	Instruments & Controls	\$340,195	\$199,195	\$199,195	\$199,195	\$937,780
18.00	Process Piping & Equipment	\$1,553,959	\$1,572,913	\$1,438,695	\$1,361,843	\$5,927,410
	<b>Sub Total</b>	<b>\$4,980,353</b>	<b>\$2,282,298</b>	<b>\$2,117,836</b>	<b>\$1,944,080</b>	<b>\$11,324,547</b>
	Tax & Freight	282,779	125,680	113,112	106,828	\$628,398
	General Conditions	\$421,051	\$192,638	\$178,476	\$164,071	\$956,236
	General Contractor Mark-Up	\$478,373	\$220,042	\$204,924	\$187,479	\$1,090,818
	<b>Field Costs - Sub Total</b>	<b>\$6,162,556</b>	<b>\$2,820,657</b>	<b>\$2,614,348</b>	<b>\$2,402,438</b>	<b>\$13,999,999</b>
	Design Fee Allowance	924,383	423,099	392,152	360,366	\$2,100,000
	Construction Management Allowance	\$184,877	\$84,620	\$78,430	\$72,073	\$420,000
	Plan Check & Permit Fee Allowance	\$21,843	\$9,708	\$8,737	\$8,252	\$48,539
	Third Party Inspection Allowance	\$16,382	\$7,281	\$6,553	\$6,189	\$36,404
	Escalation					\$0
	Project Contingency	\$2,070,463	\$920,206	\$828,185	\$782,175	\$4,601,028
	<b>Sub Total</b>	<b>\$9,380,504</b>	<b>\$4,265,569</b>	<b>\$3,928,405</b>	<b>\$3,631,491</b>	<b>\$21,205,969</b>
	Owners Costs					\$0
	Round Off	\$31				\$31
	<b>GRAND TOTAL</b>	<b>\$9,380,535</b>	<b>\$4,265,569</b>	<b>\$3,928,405</b>	<b>\$3,631,491</b>	<b>\$21,206,000</b>

Prepared By: *P.H.M.*  
 Date: 6/24/05

Approved By: *R.N. Wedger*  
 Date: 6/24/05



Eichleay Engineers Inc. of California

ESTIMATE SUMMARY SHEET

Client Name: Wine Institute

Estimated By: P.H.M.

Job Number: 30913

PRELIMINARY ESTIMATE

Checked By: R.H.

Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	W/O Escalation & Owners Costs			TOTAL	
		TOTAL MHRS	TOTAL COSTS			
			LABOR	MAT'L	SUBCON.	
<b>SUMMARY</b>						
2.00	Site Construction		\$0	\$0	\$1,270,030	\$1,270,030
3.00	Concrete		\$0	\$0	\$444,950	\$444,950
4.00	Masonry		\$0	\$0	\$0	\$0
5.00	Metals		\$711,959	\$1,779,595	\$40,000	\$2,531,554
6.00	Wood & Plastics		\$0	\$0	\$0	\$0
7.00	Thermal & Moisture Protection		\$0	\$0	\$0	\$0
8.00	Door & Windows		\$0	\$0	\$0	\$0
9.00	Finishes		\$0	\$0	\$0	\$0
10.00	Specialties		\$260	\$0	\$8,360	\$8,620
11.00	Equipment		\$0	\$0	\$0	\$0
12.00	Furnishings		\$0	\$0	\$0	\$0
13.00	Special Construction		\$0	\$0	\$0	\$0
14.00	Conveying Systems		\$0	\$0	\$0	\$0
15.00	Mechanical HVAC & Plumbing		\$0	\$0	\$0	\$0
16.00	Electrical		\$65,016	\$85,787	\$53,400	\$204,203
17.00	Instruments & Controls		\$140,550	\$672,230	\$125,000	\$937,780
18.00	Process Piping & Equipment		\$1,555,068	\$3,175,093	\$1,197,250	\$5,927,411
	<b>Sub Total</b>		<b>\$2,472,653</b>	<b>\$5,712,705</b>	<b>\$3,138,990</b>	<b>\$11,324,548</b>
	Tax & Freight (11%)					\$628,398
	General Conditions (8%)					\$956,236
	General Contractor Mark-Up (10%)					\$1,090,818
	<b>Field Costs - Sub Total</b>					<b>\$13,999,999</b>
	Design Fee Allowance (15%)					\$2,100,000
	Construction Management Allowance (3%)					\$420,000
	Plan Check & Permit Fee Allowance (2%)					\$48,539
	Third Party Inspection Allowance (1.5%)					\$36,404
	Escalation					
	Project Contingency					\$4,601,028
	<b>Sub Total</b>					<b>\$21,205,970</b>
	Owners Costs					\$0
	Round Off					\$30
	<b>GRAND TOTAL</b>					<b>\$21,206,000</b>

Prepared By:

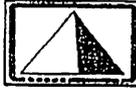
Date:

*[Signature]*  
6/24/05

Approved By:

Date:

*[Signature]*  
6/24/05



**Eichle**  
Engineers Inc. of CA

Client Name: Wine Institute  
Job Number: 30913  
Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

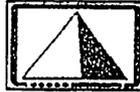
**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
Checked By: R.H.  
Rev. 2 Date: 6/24/05

O:\30913\5.0 Design Documents\Estimates\Rev. 2\Living

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	<b>020 - Site Construction</b>												
1	Excavation allowance for voc-1		cy					50.00	50.00				
2	Excavation allowance for voc-2	109	cy					50.00	50.00			5,450	5,450
3	Excavation allowance for voc-3	109	cy					50.00	50.00			5,450	5,450
4	Excavation allowance for voc-4	109	cy					50.00	50.00			5,450	5,450
1	Install and compact clean fill for VOC area	25000	cy					35.00	35.00			875,000	875,000
1	Allowance to demo road	1780	sy					6.00	6.00			10,680	10,680
1	Install asphalt in new expanded area including road	92000	sf					4.00	4.00			368,000	368,000
<b>TOTAL - Site Construction</b>												1,270,030	1,270,030

Client Name: Wine Institute  
 Job Number: 30913  
 Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters



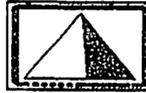
Eichleay  
 Engineers Inc. of CA

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
 Checked By: R.H.  
 Rev. 2 Date: 6/24/05

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CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	<b>030 - Concrete</b>												
	VOC -1 Duct sections												
1	Install drilled piers (20) rack #1	20	ea					1,000.00	1,000.00			20,000	20,000
1	Install drilled piers (20) rack #2	20	ea					1,000.00	1,000.00			20,000	20,000
1	Install drilled piers (42) for main rack inside plant	42	ea					1,500.00	1,500.00			63,000	63,000
1	Install drilled piers (46) for main rack outside plant	46	ea					700.00	700.00			32,200	32,200
1	Install drilled piers (32) for main rack by VOC's	32	ea					700.00	700.00			22,400	22,400
1	Install foundation for VOC-1 & tank	110	cy					450.00	450.00			49,500	49,500
	VOC -2 Duct sections												
2	Install drilled piers (16) rack #3	16	ea					1,000.00	1,000.00			16,000	16,000
2	Install drilled piers (18) rack #4	16	ea					1,000.00	1,000.00			16,000	16,000
2	Install foundation for VOC-1 & tank	110	cy					450.00	450.00			49,500	49,500
	VOC -3 Duct sections												
3	Install drilled piers (16) rack #6	16	ea					1,000.00	1,000.00			16,000	16,000
3	Install drilled piers (20) rack #7	20	ea					1,000.00	1,000.00			20,000	20,000
3	Install foundation for VOC-1 & tank	110	cy					450.00	450.00			49,500	49,500
	VOC -4 Duct sections												
4	Install drilled piers (0) rack #4		ea					1,000.00	1,000.00				
4	Install drilled piers (20) rack #5	20	ea					1,000.00	1,000.00			20,000	20,000
4	Install foundation for VOC-1 & tank	110	cy					450.00	450.00			49,500	49,500
	Allowance for building pad	3	cy					450.00	450.00			1,350	1,350
	<b>TOTAL - Concrete</b>											444,950	444,950



**Eichle**  
Engineers Inc. of CA

Client Name: Wine Institute

Job Number: 30913

Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

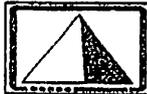
**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.

Checked By: R.H.

Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS			TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	
	<b>050 - Metals</b>											
	VOC -1 Duct Section											
1	Fab & install main duct rack frames ( inside unit - 45 ft)	21	ea	20	420	65.00	6,500.00		7,800.00	27,300	136,500	163,800
1	Fab & install main duct rack top connection members	640	ft	0.75	480	65.00	45.00		93.75	31,200	28,800	60,000
1	Fab & install main duct rack bottom connection members	640	ft	0.75	480	65.00	45.00		93.75	31,200	28,800	60,000
1	Fab & install main duct rack top cross bracing	80	ea	6	480	65.00	690.00		1,080.00	31,200	55,200	86,400
1	Fab & install main duct rack lower cross bracing	40	ea	6	240	65.00	950.00		1,340.00	15,600	38,000	53,600
1	Fab & install main duct rack frames ( outside unit - 25 ft)	23	ea	10	230	65.00	4,420.00		5,070.00	14,950	101,660	116,610
1	Fab & install main duct rack top connection members	680	ft	0.5	340	65.00	45.00		77.50	22,100	30,600	52,700
1	Fab & install main duct rack top cross bracing	92	ea	4	368	65.00	600.00		860.00	23,920	55,200	79,120
1	Fab & install main duct rack lower cross bracing	22	ea	4	88	65.00	700.00		960.00	5,720	15,400	21,120
1	Fab & install main duct rack frames ( VOC area )	16	ea	4	64	65.00	1,430.00		1,690.00	4,160	22,880	27,040
1	3' wide grating on main rack	2700	sf	0.15	405	65.00	19.00		28.75	26,325	51,300	77,625
1	handrails	1800	lf	0.3	540	65.00	75.00		94.50	35,100	135,000	170,100
1	Allowance for grating from main rack to existing catwalks	1	lot	50	50	65.00	5,000.00		8,250.00	3,250	5,000	8,250
1	Allowance for caged ladders	200	ft	0.5	100	65.00	50.00		82.50	6,500	10,000	16,500
1	15 x 8 towers	5	ea	80	400	65.00	14,000.00		19,200.00	26,000	70,000	96,000
1	15' top level connection beams	8	ea	8	64	65.00	550.00		1,070.00	4,160	4,400	8,560
1	cross bracing on top open sections	4	ea	8	32	65.00	300.00		820.00	2,080	1,200	3,280
1	15 x 15 towers	5	ea	80	400	65.00	18,000.00		23,200.00	26,000	90,000	116,000
1	15' top level connection beams	8	ea	8	64	65.00	550.00		1,070.00	4,160	4,400	8,560
1	cross bracing on top open sections	4	ea	8	32	65.00	300.00		820.00	2,080	1,200	3,280
1	3' wide grating on walkway 1 & 2	810	sf	0.15	121.5	65.00	19.00		28.75	7,898	15,390	23,288
1	3' wide grating to tanks	510	sf	0.15	76.5	65.00	19.00		28.75	4,973	9,690	14,663
1	handrails	920	lf	0.3	276	65.00	75.00		94.50	17,940	69,000	86,940
1	grating to existing catwalks	120	sf	0.15	18	65.00	19.00		28.75	1,170	2,280	3,450



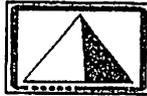
**Eichleay**  
Engineers Inc. of CA

Client Name: Wine Institute  
Job Number: 30913  
Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
Checked By: R.H.  
Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
VOC-2 Duct Section													
2	15 x 15 towers	4	ea	20	80	65.00	20,000.00		21,300.00	5,200	80,000		85,200
2	20' top level connection beams	6	ea	2	12	65.00	700.00		830.00	780	4,200		4,980
2	cross bracing on top open sections	3	ea	2	6	65.00	400.00		530.00	390	1,200		1,590
2	15 x 15 towers	3	ea	20	60	65.00	20,000.00		21,300.00	3,900	60,000		63,900
2	15' top level connection beams	4	ea	2	8	65.00	550.00		680.00	520	2,200		2,720
2	cross bracing on top open sections	2	ea	2	4	65.00	300.00		430.00	260	600		860
2	15 x 20 towers - shared vertical columns	2	ea	20	40	65.00	20,000.00		21,300.00	2,600	40,000		42,600
2	15 x 15 tower	1	ea	20	20	65.00	10,000.00		11,300.00	1,300	10,000		11,300
2	3' wide grating on walkway 3, 4' wide on walkway 4	945	sf	0.15	141.75	65.00	19.00		28.75	9,214	17,955		27,169
2	3' wide grating to tanks	360	sf	0.15	54	65.00	19.00		28.75	3,510	6,840		10,350
2	handrails	820	lf	0.3	246	65.00	75.00		94.50	15,990	61,500		77,490
2	grating to existing catwalks	165	sf	0.15	24.75	65.00	19.00		28.75	1,609	3,135		4,744
VOC-3 Duct Section													
3	20 x 8 towers	3	ea	20	60	65.00	15,000.00		16,300.00	3,900	45,000		48,900
3	20' top level connection beams	6	ea	2	12	65.00	700.00		830.00	780	4,200		4,980
3	cross bracing on top open sections	3	ea	2	6	65.00	400.00		530.00	390	1,200		1,590
3	15 x 8 towers	1	ea	20	20	65.00	14,000.00		15,300.00	1,300	14,000		15,300
3	15 x 15 towers	5	ea	20	100	65.00	18,000.00		19,300.00	6,500	90,000		96,500
3	15' top level connection beams	8	ea	2	16	65.00	550.00		680.00	1,040	4,400		5,440
3	cross bracing on top open sections	4	ea	2	8	65.00	300.00		430.00	520	1,200		1,720
3	3' wide grating on walkway 6 & 7	810	sf	0.15	121.5	65.00	19.00		28.75	7,898	15,390		23,288
3	3' wide grating to tanks	510	sf	0.15	76.5	65.00	19.00		28.75	4,973	9,690		14,663
3	handrails	920	lf	0.3	276	65.00	75.00		94.50	17,940	69,000		86,940
3	grating to existing catwalks	60	sf	0.15	9	65.00	19.00		28.75	585	1,140		1,725



**Eichle**  
Engineers Inc. of CA

Client Name: Wine Institute  
 Job Number: 30913  
 Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

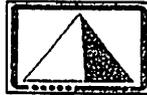
**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
 Checked By: R.H.  
 Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	VOC-4 Duct Section												
4	15 x 15 towers	5	ea	20	100	65.00	18,000.00		19,300.00	6,500	90,000		96,500
4	15' top level connection beams	8	ea	2	16	65.00	550.00		680.00	1,040	4,400		5,440
4	cross bracing on top open sections	4	ea	2	8	65.00	300.00		430.00	520	1,200		1,720
4	shared end section with voc-2	1	ea	40	40	65.00	10,000.00		12,600.00	2,600	10,000		12,600
4	3' wide grating on walkway 7	405	sf	0.15	60.75	65.00	19.00		28.75	3,949	7,695		11,644
4	3' wide grating to tanks	450	sf	0.15	67.5	65.00	19.00		28.75	4,388	8,550		12,938
4	handrails	840	lf	0.3	252	65.00	75.00		94.50	16,380	63,000		79,380
ALL	Allowance for additional supports & grating	1	lot	500	500	65.00	70,000.00		102,500	32,500	70,000		102,500
1	Crane to install main rack outside plant area	3	wks					2,000.00	2,000.00			6,000	6,000
1	( 40 ton)	1	lot	120	120	75.00			9,000.00	9,000			9,000
1	Allowance for small cranes to position steel (3)	6	mo	160	960	75.00		2,000.00	14,000.00	72,000		12,000	84,000
2	Allowance for small cranes to position steel (2)	2	mo	160	320	75.00		2,000.00	14,000.00	24,000		4,000	28,000
3	Allowance for small cranes to position steel (2)	2	mo	160	320	75.00		2,000.00	14,000.00	24,000		4,000	28,000
4	Allowance for small cranes to position steel (2)	2	mo	160	320	75.00		2,000.00	14,000.00	24,000		4,000	28,000
ALL	allowance for overtime to build structures to work around helicopter usage	1	lot	1000	1000	25.00			25,000.00	25,000			25,000
ALL	Allowance to touch up paint	1	lot					10,000.00	10,000.00			10,000	10,000
<b>TOTAL - Metals</b>					11255					711,959	1,779,595	40,000	2,531,554



Client Name: Wine Institute  
 Job Number: 30913  
 Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters



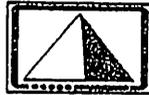
**Eichl**  
 Engineers Inc. of CA

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
 Checked By: R.H.  
 Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHR	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	<b>016 - Electrical</b>												
	<b>POWER DISTRIBUTION</b>												
	VOC -1												
1	DISCONNECT SWITCH FUSABLE, 400A, 600V, 3PH, 3W	1	EA	10	10	75.00	2,025.00		2,775.00	750	2,025		2,775
1	#600 MCM CONDUCTOR	1.2	CLF	6.154	7	75.00	475.00		936.55	554	570		1,124
1	#2 GROUND	5	CLF	1.778	9	75.00	47.00		180.35	667	235		902
1	3" RIGID ALUMINUM	40	LF	0.18	7	75.00	9.45		22.95	540	378		918
1	3" IN-LINE PULL FITTINGS	2	EA	2.7	5	75.00	415.00		617.50	405	830		1,235
1	16X16X6 PULL BOX	1	EA	6.15	6	75.00	810.00		1,271.25	461	810		1,271
1	3"90-DEGREE RGS,PVC COATED	2	EA	1.9	4	75.00	69.00		211.50	285	138		423
1	FUSE 400A	3	EA	0.333	1	75.00	130.00		154.98	75	390		465
1	3000A main switchboard	1	EA	28.57	29	75.00	4,675.00		6,817.75	2,143	4,675		6,818
1	3000A 600V CIRCUIT BREAKER	1	EA	36.36	36	75.00	24,300.00		27,027.00	2,727	24,300		27,027
1	BUS CIRCUIT BREAKER 400A 480V 3PH	1	EA	3	3	75.00	3,100.00		3,325.00	225	3,100		3,325
1	MISC SUPPORTS, FITTINGS, TERMINATIONS	1	LOT							1,766	7,490		9,257
1	CHECKOUT AND TESTING	1	LOT	100	100	75.00			7,500.00	7,500			7,500
	VOC -2												
2	DISCONNECT SWITCH FUSABLE, 600A, 600V, 3PH, 3W	1	EA	16	16	75.00	3,000.00		4,200.00	1,200	3,000		4,200
2	#600 MCM CONDUCTOR	2.4	CLF	7.3	18	75.00	585.00		1,132.50	1,314	1,404		2,718
2	#2 GROUND	5	CLF	1.778	9	75.00	47.00		180.35	667	235		902
2	3" RIGID ALUMINUM	80	LF	0.18	14	75.00	9.45		22.95	1,080	756		1,836
2	3" IN-LINE PULL FITTINGS	2	EA	2.7	5	75.00	415.00		617.50	405	830		1,235
2	16X16X6 PULL BOX	1	EA	6.15	6	75.00	810.00		1,271.25	461	810		1,271
2	3"90-DEGREE RGS,PVC COATED	2	EA	1.9	4	75.00	69.00		211.50	285	138		423
2	FUSE 400A	3	EA	0.333	1	75.00	150.00		174.98	75	450		525
2	BUS CIRCUIT BREAKER 400A 480V 3PH	1	EA	5	5	75.00	3,775.00		4,150.00	375	3,775		4,150
2	MISC SUPPORTS, FITTINGS, TERMINATIONS	1	LOT							1,172	2,280		3,452
2	CHECKOUT AND TESTING	1	LOT	100	100	75.00			7,500.00	7,500			7,500

Client Name: Wine Institute  
 Job Number: 30913  
 Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

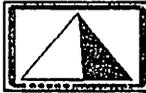


**Eichl** /  
 Engineers Inc. of CA

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
 Checked By: R.H.  
 Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHR	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	VOC -3												
3	DISCONNECT SWITCH FUSABLE, 400A, 600V, 3PH, 3W	1	EA	10	10	75.00	2,025.00		2,775.00	750	2,025		2,775
3	#600 MCM CONDUCTOR	3.6	CLF	6.154	22	75.00	475.00		936.55	1,662	1,710		3,372
3	#2 GROUND	5	CLF	1.778	9	75.00	47.00		180.35	667	235		902
3	3" RIGID ALUMINUM	120	LF	0.18	22	75.00	9.45		22.95	1,620	1,134		2,754
3	3" IN-LINE PULL FITTINGS	2	EA	2.7	5	75.00	415.00		617.50	405	830		1,235
3	16X16X6 PULL BOX	1	EA	6.15	6	75.00	810.00		1,271.25	461	810		1,271
3	3"90-DEGREE RGS,PVC COATED	2	EA	1.9	4	75.00	69.00		211.50	285	138		423
3	FUSE 400A	3	EA	0.333	1	75.00	130.00		154.98	75	390		465
3	BUS CIRCUIT BREAKER 400A 480V 3PH	1	EA	3	3	75.00	3,100.00		3,325.00	225	3,100		3,325
3	MISC SUPPORTS, FITTINGS, TERMINATIONS	1	LOT							1,230	2,074		3,304
3	CHECKOUT AND TESTING	1	LOT	100	100	75.00			7,500.00	7,500			7,500
	VOC -4												
4	DISCONNECT SWITCH FUSABLE, 400A, 600V, 3PH, 3W	1	EA	10	10	75.00	2,025.00		2,775.00	750	2,025		2,775
4	#600 MCM CONDUCTOR	6	CLF	6.154	37	75.00	475.00		936.55	2,769	2,850		5,619
4	#2 GROUND	5	CLF	1.778	9	75.00	47.00		180.35	667	235		902
4	3" RIGID ALUMINUM	200	LF	0.18	36	75.00	9.45		22.95	2,700	1,890		4,590
4	3" IN-LINE PULL FITTINGS	2	EA	2.7	5	75.00	415.00		617.50	405	830		1,235
4	16X16X6 PULL BOX	1	EA	6.15	6	75.00	810.00		1,271.25	461	810		1,271
4	3"90-DEGREE RGS,PVC COATED	2	EA	1.9	4	75.00	69.00		211.50	285	138		423
4	FUSE 400A	3	EA	0.333	1	75.00	130.00		154.98	75	390		465
4	BUS CIRCUIT BREAKER 400A 480V 3PH	1	EA	3	3	75.00	3,100.00		3,325.00	225	3,100		3,325
4	MISC SUPPORTS, FITTINGS, TERMINATIONS	1	LOT							1,667	2,454		4,121
4	CHECKOUT AND TESTING	1	LOT	100	100	75.00			7,500.00	7,500			7,500



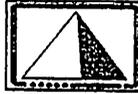
**Eichle**  
Engineers Inc. of CA

Client Name: Wine Institute  
Job Number: 30913  
Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
Checked By: R.H.  
Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
1	Allowance for installing lighting at VOC areas	1	lot					40,000.00	40,000.00			40,000	40,000
1	Allowance for installing lighting on main duct	670	ft					20.00	20.00			13,400	13,400
<b>TOTAL - Electrical</b>					<b>789</b>					<b>65,016</b>	<b>85,787</b>	<b>53,400</b>	<b>204,203</b>



**Eichle**  
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Client Name: Wine Institute

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Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.

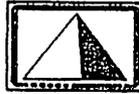
Checked By: R.H.

Rev. 2 Date: 6/24/05

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CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	<b>017 - Instruments &amp; Controls</b>												
ALL	Ethanol Analyzer (at RTO)	4	ea	16	64	75.00	20,000.00		21,200.00	4,800	80,000		84,800
ALL	Capacitance probe / transmitter	60	ea	4	240	75.00	1,200.00		1,500.00	18,000	72,000		90,000
ALL	Actuated BF vent valve - 12" fermenter	60	ea	4	240	75.00	6,500.00		6,800.00	18,000	390,000		408,000
ALL	Actuated BF vent valve - 36" KO pots	4	ea	8	32	75.00	10,000.00		10,600.00	2,400	40,000		42,400
ALL	Local hand switch for BF closing	64	ea	4	256	75.00	200.00		500.00	19,200	12,800		32,000
ALL	Relief Vent - KO pots	4	ea	4	16	75.00	3,000.00		3,300.00	1,200	12,000		13,200
	Level transmitter & indicator					75.00	1,200.00		1,200.00				
ALL	High level switch	4	ea	4	16	75.00	750.00		1,050.00	1,200	3,000		4,200
ALL	Low level switch	4	ea	4	16	75.00	750.00		1,050.00	1,200	3,000		4,200
ALL	Level gauge	4	ea	2	8	75.00	1,000.00		1,150.00	600	4,000		4,600
ALL	Pressure gauge	16	ea	1	16	75.00	300.00		375.00	1,200	4,800		6,000
ALL	Pressure transmitter	4	ea	4	16	75.00	1,500.00		1,800.00	1,200	6,000		7,200
ALL	Temperature gauge w/ TW	16	ea	4	64	75.00	300.00		600.00	4,800	4,800		9,600
1	Temperature transmitter, RTD, TW	2	ea	4	8	75.00	1,200.00		1,500.00	600	2,400		3,000
	Relief valves						300.00		300.00				
	Pressure regulator - liquid						300.00		300.00				
	Pressure regulator - steam						1,500.00		1,500.00				
ALL	On- off control valve Stations	4		4	16	75.00	1,000.00		1,300.00	1,200	4,000		5,200
ALL	Conduit, factored 20' per tank	1200	ft	0.2	240	75.00	8.00		23.00	18,000	9,600		27,600
ALL	Conduit, factored 300' per RTO	1200	ft	0.2	240	75.00	8.00		23.00	18,000	9,600		27,600
ALL	Wire, factored 50' per instrument/valve	7300	ft	0.02	146	75.00	0.10		1.60	10,950	730		11,680
ALL	Allowance for air tubing	1	lot	240	240	75.00	500.00		18,500.00	18,000	500		18,500





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**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
Checked By: R.H.  
Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
<b>018 - Process Piping &amp; Equipment</b>													
VOC Control Equipment													
1	VOC-1 16,000 scfm RTO unit	1	ea	200	200	65.00	416,000		429,000	13,000	416,000		429,000
2	VOC-2 22,000 scfm RTO unit	1	ea	250	250	65.00	503,000		519,250	16,250	503,000		519,250
3	VOC-3 13,000 scfm RTO unit	1	ea	200	200	65.00	367,000		380,000	13,000	367,000		380,000
4	VOC-4 13,000 scfm RTO unit	1	ea	200	200	65.00	367,000		380,000	13,000	367,000		380,000
all	Adder for RTO for higher SP blower & O2 control loop	4	ea				35,000.00		35,000.00		140,000		140,000
all	Allowance for stainless stack & alum. Grating & handrails	4	ea				15,000.00		15,000.00		60,000		60,000
Install refractory in VOC's													
1	VOC-1	1	lot	80	80	70.00			5,600.00	5,600			5,600
2	VOC-2	1	lot	100	100	70.00			7,000.00	7,000			7,000
3	VOC-3	1	lot	80	80	70.00			5,600.00	5,600			5,600
4	VOC-4	1	lot	80	80	70.00			5,600.00	5,600			5,600
Knock out vessels													
1	KO Vessel for VOC-1 - 5000 gal	1	ea	20	20	65.00	37,000.00		38,300.00	1,300	37,000		38,300
2	KO Vessel for VOC-2 - 7000 gal	1	ea	20	20	65.00	45,000.00		46,300.00	1,300	45,000		46,300
3	KO Vessel for VOC-3 - 4000 gal	1	ea	20	20	65.00	33,000.00		34,300.00	1,300	33,000		34,300
4	KO Vessel for VOC-4 - 4000 gal	1	ea	20	20	65.00	33,000.00		34,300.00	1,300	33,000		34,300
Nozzle Fabrication/Installation at each tank													
all	12" Nozzle(Fabricate)	60	ea	4	240	65.00	215.00		475.00	15,600	12,900		28,500
all	Machine Cut Hole(Specialty Service)	60	ea	2	120	65.00	20.00	600.00	750.00	7,800	1,200	36,000	45,000
all	12" Nozzle(Install)	60	ea	4	240	65.00			260.00	15,600			15,600
all	2" Nozzle(Fabricate)	60	ea	1.5	90	65.00	40.00		137.50	5,850	2,400		8,250
all	Drill Hole W/Hole Saw Auger	60	ea	1	60	65.00			65.00	3,900			3,900
all	2" Nozzle(Install)	60	ea	3	180	65.00			195.00	11,700			11,700



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Job Number: 30913

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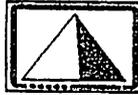
**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.

Checked By: R.H.

Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
all	36" Nozzle(Fabricate)	60	ea	8	480	65.00	350.00		870.00	31,200	21,000		52,200
all	Machine Cut Hole(Specialty Service)	60	ea	4	240	65.00	20.00	600.00	880.00	15,600	1,200	36,000	52,600
all	36" Nozzle(Install)	60	ea	10	600	65.00			650.00	39,000			39,000
	Allowance for passivation												
all	install gel	180	ea	4	720	65.00	150.00		410.00	46,800	27,000		73,800
all	neutralize & flush & dry	180	ea	2	360	65.00	20.00		150.00	23,400	3,600		27,000
all	Insulation Removal	60	ea	2	120	65.00			130.00	7,800			7,800
all	Scaffolding - 38' tanks(Install)	12	ea	24	288	65.00			1,560.00	18,720			18,720
ALL	Scaffolding - 24' to 28' tanks(Install)	48	ea	20	960	65.00			1,300.00	62,400			62,400
all	Scaffolding - 38' tanks(Remove)	12	ea	12	144	65.00			780.00	9,360			9,360
all	Scaffolding - 24' to 28' tanks(Remove)	48	ea	10	480	65.00			650.00	31,200			31,200
	Ducting Installation												
1	VOC-1												
1	10" Duct	36	ft				54.00		54.00		1,944		1,944
1	10" Duct misc. fittings	1	lot				800.00		800.00		800		800
1	Bolt up	10	ea	1.5	15	65.00			97.50	975			975
1	Handle	9	ea	2.08	18.72	65.00			135.20	1,217			1,217
1	Install	2	lot	2	4	65.00			130.00	260			260
1	12" Duct	40	ft				62.00		62.00		2,480		2,480
1	12" Duct misc. fittings	1	lot				1,000.00		1,000.00		1,000		1,000
1	Bolt up	12	ea	1.5	18	65.00			97.50	1,170			1,170
1	Handle	10	ea	2.08	20.8	65.00			135.20	1,352			1,352
1	Install	2	lot	2	4	65.00			130.00	260			260
1	16" Duct	24	ft				77.00		77.00		1,848		1,848
1	16" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
1	Bolt up	8	ea	2	16	65.00			130.00	1,040			1,040



**Eichle**  
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**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
Checked By: R.H.  
Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
1	Handle	6	ea	3	18	65.00			195.00	1,170			1,170
1	Install	2	lot	2	4	65.00			130.00	260			260
1	18" Duct	45	ft				86.00		86.00		3,870		3,870
1	18" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
1	Bolt up	13	ea	3	39	65.00			195.00	2,535			2,535
1	Handle	11	ea	3.52	38.72	65.00			228.80	2,517			2,517
1	Install	3	lot	2	6	65.00			130.00	390			390
1	20" Duct	40	ft				92.00		92.00		3,680		3,680
1	20" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
1	Bolt up	12	ea	4	48	65.00			260.00	3,120			3,120
1	Handle	10	ea	4.6	46	65.00			299.00	2,990			2,990
1	Install	3	lot	3	9	65.00			195.00	585			585
1	22" Duct	60	ft				99.00		99.00		5,940		5,940
1	22" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
1	Bolt up	18	ea	4	72	65.00			260.00	4,680			4,680
1	Handle	16	ea	4.6	73.6	65.00			299.00	4,784			4,784
1	Install	4	lot	3	12	65.00			195.00	780			780
1	24" Duct	18	ft				106.00		106.00		1,908		1,908
1	24" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
1	Bolt up	6	ea	4	24	65.00			260.00	1,560			1,560
1	Handle	5	ea	4.6	23	65.00			299.00	1,495			1,495
1	Install	1	lot	3	3	65.00			195.00	195			195
1	28" Duct	85	ft				119.00		119.00		10,115		10,115
1	28" Duct misc. fittings	1	lot				4,000.00		4,000.00		4,000		4,000
1	Bolt up	22	ea	5.5	121	65.00			357.50	7,865			7,865
1	Handle	21	ea	5.32	111.72	65.00			345.80	7,262			7,262
1	Install	5	lot	3	15	65.00			195.00	975			975
1	36" Duct	385	ft				199.00		199.00		76,615		76,615
1	36" Duct misc. fittings	1	lot				20,000.00		20,000.00		20,000		20,000



**Eichleay**  
Engineers Inc. of CA

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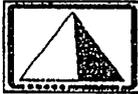
**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.

Checked By: R.H.

Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHR	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
1	Bolt up	100	ea	6.5	650	65.00			422.50	42,250			42,250
1	Handle	96	ea	7.2	691.2	65.00			468.00	44,928			44,928
1	Install	20	lot	3	60	65.00			195.00	3,900			3,900
	VOC-2												
2	12" Duct	75	ft				62.00		62.00		4,650		4,650
2	12" Duct misc. fittings	1	lot				1,000.00		1,000.00		1,000		1,000
2	Bolt up	21	ea	1.5	31.5	65.00			97.50	2,048			2,048
2	Handle	19	ea	2.08	39.52	65.00			135.20	2,569			2,569
2	Install	4	lot	2	8	65.00			130.00	520			520
2	18" Duct	65	ft				86.00		86.00		5,590		5,590
2	18" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
2	Bolt up	19	ea	3	57	65.00			195.00	3,705			3,705
2	Handle	17	ea	3.52	59.84	65.00			228.80	3,890			3,890
2	Install	3	lot	2	6	65.00			130.00	390			390
2	22" Duct	50	ft				99.00		99.00		4,950		4,950
2	22" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
2	Bolt up	15	ea	4	60	65.00			260.00	3,900			3,900
2	Handle	13	ea	4.6	59.8	65.00			299.00	3,887			3,887
2	Install	3	lot	3	9	65.00			195.00	585			585
2	24" Duct	35	ft				106.00		106.00		3,710		3,710
2	24" Duct misc. fittings	1	lot				3,000.00		3,000.00		3,000		3,000
2	Bolt up	11	ea	4	44	65.00			260.00	2,860			2,860
2	Handle	9	ea	4.6	41.4	65.00			299.00	2,691			2,691
2	Install	2	lot	3	6	65.00			195.00	390			390
2	28" Duct	15	ft				119.00		119.00		1,785		1,785
2	28" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
2	Bolt up	5	ea	5.5	27.5	65.00			357.50	1,788			1,788
2	Handle	4	ea	5.32	21.28	65.00			345.80	1,383			1,383



**Eichle**  
Engineers Inc. of CA

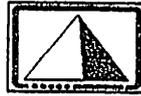
Client Name: Wine Institute  
 Job Number: 30913  
 Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
 Checked By: R.H.  
 Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
2	Install	1	lot	3	3	65.00			195.00	195			195
2	30" Duct	25	ft				128.00		128.00		3,200		3,200
2	30" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
2	Bolt up	8	ea	5.5	44	65.00			357.50	2,860			2,860
2	Handle	6	ea	5.32	31.92	65.00			345.80	2,075			2,075
2	Install	1	lot	3	3	65.00			195.00	195			195
2	32" Duct	265	ft				177.00		177.00		46,905		46,905
2	32" Duct misc. fittings	1	lot				4,500.00		4,500.00		4,500		4,500
2	Bolt up	68	ea	6	408	65.00			390.00	26,520			26,520
2	Handle	66	ea	6	396	65.00			390.00	25,740			25,740
2	Install	13	lot	3	39	65.00			195.00	2,535			2,535
2	42" Duct	415	ft				242.00		242.00		100,430		100,430
2	42" Duct misc. fittings	1	lot				25,000.00		25,000.00		25,000		25,000
2	Bolt up	115	ea	6.5	747.5	65.00			422.50	48,588			48,588
2	Handle	104	ea	7.12	740.48	65.00			462.80	48,131			48,131
2	Install	21	lot	4	84	65.00			260.00	5,460			5,460
	VOC-3												
3	6" Duct	25	ft				38.00		38.00		950		950
3	6" Duct misc. fittings	1	lot				500.00		500.00		500		500
3	Bolt up	7	ea	1	7	65.00			65.00	455			455
3	Handle	6	ea	1.4	8.4	65.00			91.00	546			546
3	Install	1	lot	1.5	1.5	65.00			97.50	98			98
3	10" Duct	35	ft				54.00		54.00		1,890		1,890
3	10" Duct misc. fittings	1	lot				1,000.00		1,000.00		1,000		1,000
3	Bolt up	11	ea	1.5	16.5	65.00			97.50	1,073			1,073
3	Handle	9	ea	1.72	15.48	65.00			111.80	1,006			1,006
3	Install	2	lot	2	4	65.00			130.00	260			260
3	12" Duct						62.00		62.00		4,340		4,340

Client Name: Wine Institute  
 Job Number: 30913  
 Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

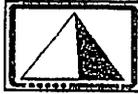


Eichleay  
 Engineers Inc. of CA

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
 Checked By: R.H.  
 Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHR	UNIT COSTS			TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	
3	12" Duct misc. fittings	1	lot				1,000.00		1,000.00		1,000	1,000
3	Bolt up	20	ea	1.5	30	65.00			97.50	1,950		1,950
3	Handle	18	ea	2.08	37.44	65.00			135.20	2,434		2,434
3	Install	3	lot	2	6	65.00			130.00	390		390
3	16" Duct	48	ft				69.00		69.00		3,312	3,312
3	16" Duct misc. fittings	1	lot				1,500.00		1,500.00		1,500	1,500
3	Bolt up	14	ea	2.5	35	65.00			162.50	2,275		2,275
3	Handle	12	ea	3	36	65.00			195.00	2,340		2,340
3	Install	3	lot	2	6	65.00			130.00	390		390
3	18" Duct	22	ft				86.00		86.00		1,892	1,892
3	18" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000	2,000
3	Bolt up	8	ea	3	24	65.00			195.00	1,560		1,560
3	Handle	6	ea	3.52	21.12	65.00			228.80	1,373		1,373
3	Install	1	lot	2	2	65.00			130.00	130		130
3	20" Duct	8	ft				92.00		92.00		736	736
3	20" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000	2,000
3	Bolt up	3	ea	4	12	65.00			260.00	780		780
3	Handle	2	ea	4.6	9.2	65.00			299.00	598		598
3	Install	1	lot	3	3	65.00			195.00	195		195
3	22" Duct	28	ft				99.00		99.00		2,772	2,772
3	22" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000	2,000
3	Bolt up	9	ea	4	36	65.00			260.00	2,340		2,340
3	Handle	7	ea	4.6	32.2	65.00			299.00	2,093		2,093
3	Install	2	lot	3	6	65.00			195.00	390		390
3	24" Duct	20	ft				106.00		106.00		2,120	2,120
3	24" Duct misc. fittings	1	lot				3,000.00		3,000.00		3,000	3,000
3	Bolt up	7	ea	4	28	65.00			260.00	1,820		1,820
3	Handle	5	ea	4.6	23	65.00			299.00	1,495		1,495
3	Install	1	lot	3	3	65.00			195.00	195		195



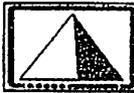
**Eichleay**  
Engineers Inc. of CA

Client Name: Wine Institute  
Job Number: 30913  
Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
Checked By: R.H.  
Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHR	UNIT COSTS			TOTAL COSTS			TOTAL	
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L		SUBCON.
3	26" Duct	8	ft				114.00		114.00		912		912
3	26" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
3	Bolt up	3	ea	5	15	65.00			325.00	975			975
3	Handle	2	ea	4.72	9.44	65.00			306.80	614			614
3	Install	1	lot	3	3	65.00			195.00	195			195
3	28" Duct	80	ft				119.00		119.00		9,520		9,520
3	28" Duct misc. fittings	1	lot				3,000.00		3,000.00		3,000		3,000
3	Bolt up	22	ea	5.5	121	65.00			357.50	7,865			7,865
3	Handle	20	ea	5.32	106.4	65.00			345.80	6,916			6,916
3	Install	4	lot	3	12	65.00			195.00	780			780
3	32" Duct	765	ft				177.00		177.00		135,405		135,405
3	32" Duct misc. fittings	1	lot				4,500.00		4,500.00		4,500		4,500
3	Bolt up	204	ea	6	1224	65.00			390.00	79,560			79,560
3	Handle	192	ea	6	1152	65.00			390.00	74,880			74,880
3	Install	38	lot	3	114	65.00			195.00	7,410			7,410
	VOC-4												
4	10" Duct	52	ft				54.00		54.00		2,808		2,808
4	10" Duct misc. fittings	1	lot				1,000.00		1,000.00		1,000		1,000
4	Bolt up	15	ea	1.5	22.5	65.00			97.50	1,463			1,463
4	Handle	13	ea	1.72	22.36	65.00			111.80	1,453			1,453
4	Install	2	lot	2	4	65.00			130.00	260			260
4	12" Duct	52	ft				62.00		62.00		3,224		3,224
4	12" Duct misc. fittings	1	lot				1,000.00		1,000.00		1,000		1,000
4	Bolt up	15	ea	1.5	22.5	65.00			97.50	1,463			1,463
4	Handle	13	ea	2.08	27.04	65.00			135.20	1,758			1,758
4	Install	2	lot	2	4	65.00			130.00	260			260
4	16" Duct	38	ft				77.00		77.00		2,926		2,926
4	16" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000



**Eichle**  
Engineers Inc. of CA

Client Name: Wine Institute

Job Number: 30913

Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

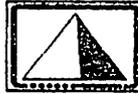
**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.

Checked By: R.H.

Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
4	Bolt up	12	ea	2	24	65.00			130.00	1,560			1,560
4	Handle	10	ea	3	30	65.00			195.00	1,950			1,950
4	Install	3	lot	2	6	65.00			130.00	390			390
4	18" Duct	50	ft				86.00		86.00		4,300		4,300
4	18" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
4	Bolt up	14	ea	3	42	65.00			195.00	2,730			2,730
4	Handle	13	ea	3.52	45.76	65.00			228.80	2,974			2,974
4	Install	3	lot	2	6	65.00			130.00	390			390
4	20" Duct	18	ft				92.00		92.00		1,656		1,656
4	20" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
4	Bolt up	7	ea	3.5	24.5	65.00			227.50	1,593			1,593
4	Handle	5	ea	4.12	20.6	65.00			267.80	1,339			1,339
4	Install	2	lot	2	4	65.00			130.00	260			260
4	22" Duct	30	ft				99.00		99.00		2,970		2,970
4	22" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
4	Bolt up	9	ea	4	36	65.00			260.00	2,340			2,340
4	Handle	8	ea	4.6	36.8	65.00			299.00	2,392			2,392
4	Install	2	lot	3	6	65.00			195.00	390			390
4	24" Duct	30	ft				106.00		106.00		3,180		3,180
4	24" Duct misc. fittings	1	lot				3,000.00		3,000.00		3,000		3,000
4	Bolt up	9	ea	4	36	65.00			260.00	2,340			2,340
4	Handle	8	ea	4.6	36.8	65.00			299.00	2,392			2,392
4	Install	2	lot	3	6	65.00			195.00	390			390
4	26" Duct	85	ft				114.00		114.00		9,690		9,690
4	26" Duct misc. fittings	1	lot				3,000.00		3,000.00		3,000		3,000
4	Bolt up	24	ea	5	120	65.00			325.00	7,800			7,800
4	Handle	22	ea	4.72	103.84	65.00			306.80	6,750			6,750
4	Install	5	lot	3	15	65.00			195.00	975			975
4	32" Duct	715	ft				177.00		177.00		126,555		126,555



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Engineers Inc. of CA

Client Name: Wine Institute

Job Number: 30913

Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

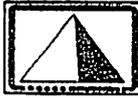
**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.

Checked By: R.H.

Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/UNIT	TOTAL MHRS	UNIT COSTS			TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	
4	32" Duct misc. fittings	1	lot				4,500.00		4,500.00		4,500	4,500
4	Bolt up	190	ea	6	1140	65.00			390.00	74,100		74,100
4	Handle	178	ea	6	1068	65.00			390.00	69,420		69,420
4	Install	36	lot	3	108	65.00			195.00	7,020		7,020
1	Install an 10" duct bank duct	17	ea	48	816	65.00	4,545.00		7,665.00	53,040	77,265	130,305
3	Install an 6" tank duct bank duct	7	ea	46	322	65.00	4,202.00		7,192.00	20,930	29,414	50,344
3	Install an 10" duct bank duct	10	ea	48	480	65.00	4,545.00		7,665.00	31,200	45,450	76,650
2	Install an 12" duct bank duct	12	ea	48	576	65.00	4,699.00		7,819.00	37,440	56,388	93,828
4	Install an 10" duct bank duct	14	ea	48	672	65.00	4,545.00		7,665.00	43,680	63,630	107,310
ALL	Allowance for drilling & welding flange to main ducts at factory	60	ea				1,350.00		1,350.00		81,000	81,000
1	Install ducting from KO drum to VOC - 1 - 28" duct	1	lot	71.28	71.28	65.00	6,750.00		11,383.20	4,633	6,750	11,383
2	Install ducting from KO drum to VOC - 2 - 36" duct	1	lot	88.48	88.48	65.00	11,754.00		17,505.20	5,751	11,754	17,505
3	Install ducting from KO drum to VOC - 3 - 26" duct	1	lot	71.28	71.28	65.00	6,032.00		10,665.20	4,633	6,032	10,665
4	Install ducting from KO drum to VOC - 4 - 26" duct	1	lot	71.28	71.28	65.00	6,032.00		10,665.20	4,633	6,032	10,665
	Allowance to modify spreader on top of tanks											
1	VOC -1 Tanks	17	ea				1,800.00	1,800.00			30,600	30,600
2	VOC -2 Tanks	12	ea				1,800.00	1,800.00			21,600	21,600
3	VOC -3 Tanks	17	ea				1,800.00	1,800.00			30,600	30,600
4	VOC -4 Tanks	14	ea				1,800.00	1,800.00			25,200	25,200
ALL	Allowance for special rigging tools & frames	1	lot				10,000.00	10,000.00			10,000	10,000



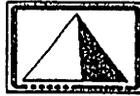
**Eichle**  
Engineers Inc. of CA

Client Name: Wine Institute  
 Job Number: 30913  
 Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
 Checked By: R.H.  
 Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	Helicopter for steel & ducting												
	VOC-1 system												
1	assume 54 lifts	60	hrs					6,000.00	6,000.00			360,000	360,000
	crew per diem	8	days					750.00	750.00			6,000	6,000
	VOC-2 system												
2	assume 28 lifts	35	hrs					6,000.00	6,000.00			210,000	210,000
	crew per diem	5	days					750.00	750.00			3,750	3,750
	VOC-3 system												
3	assume 28 lifts	35	hrs					6,000.00	6,000.00			210,000	210,000
	crew per diem	5	days					750.00	750.00			3,750	3,750
	VOC-4 system												
4	assume 23 lifts	30	hrs					6,000.00	6,000.00			180,000	180,000
	crew per diem	5	days					750.00	750.00			3,750	3,750
	Allowance for crane to install VOC's												
1	VOC-1	3	wks	160	480	75.00		2,500.00	14,500.00	36,000		7,500	43,500
2	VOC-2	3	wks	160	480	75.00		2,500.00	14,500.00	36,000		7,500	43,500
3	VOC-3	3	wks	160	480	75.00		2,500.00	14,500.00	36,000		7,500	43,500
4	VOC-4	3	wks	160	480	75.00		2,500.00	14,500.00	36,000		7,500	43,500
ALL	allowance for overtime to build structures to work around helicopter usage	1	lot	2000	2000	20.00			40,000.00	40,000			40,000
<b>TOTAL - Process Piping &amp; Equipment</b>					24987					1,555,068	3,175,093	1,197,250	5,927,411



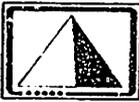
**Eichleay**  
Engineers Inc. of CA

Client Name: Wine Institute  
Job Number: 30913  
Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
Checked By: R.H.  
Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	Contingency												
2.00	Site Construction					25%	25%	25%				317,508	317,508
3.00	Concrete					50%	50%	50%				222,475	222,475
4.00	Masonry					25%	25%	25%					
5.00	Metals					30%	30%	30%	213,588	533,879	12,000		759,466
6.00	Wood & Plastics					25%	25%	25%					
7.00	Thermal & Moisture Protection					25%	25%	25%					
8.00	Door & Windows					25%	25%	25%					
9.00	Finishes					25%	25%	25%					
10.00	Specialties					25%	25%	25%	65		2,090		2,155
11.00	Equipment					25%	25%	25%					
12.00	Furnishings					25%	25%	25%					
13.00	Special Construction					25%	25%	25%					
14.00	Conveying Systems					25%	25%	25%					
15.00	Mechanical HVAC & Plumbing					25%	25%	25%					
16.00	Electrical					30%	30%	30%	19,505	25,736	16,020		61,261
17.00	Instruments & Controls					30%	30%	30%	42,165	201,669	37,500		281,334
18.00	Process Piping & Equipment					35%	35%	35%	544,274	1,111,283	419,038		2,074,594
	Design Fee Allowance							35%				735,000	735,000
	Construction Management Allowance							30%				126,000	126,000
	Plan Check & Permit Fee Allowance							25%				12,135	12,135
	Third Party Inspection Allowance							25%				9,101	9,101
	ROUND OFF		1										
	<b>TOTAL - Contingency</b>								819,596	1,872,566	1,908,866		4,601,028



Eichleay Engineers Inc. of California

**ESTIMATE SUMMARY SHEET**

Client Name: Wine Institute

Estimated By: P.H.M.

Job Number: 30913

**PRELIMINARY ESTIMATE**

Checked By: R.H.

Job Title: Fermenter VOC Emissions - LIVINGSTON UTILITIES

Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	TOTAL COSTS				TOTAL
		RTO-1	RTO-2	RTO-3	RTO-4	
<b>SUMMARY</b>						
2.00	Site Construction	\$9,350	\$0	\$0	\$0	\$9,350
3.00	Concrete	\$81,050	\$0	\$0	\$0	\$81,050
4.00	Masonry					\$0
5.00	Metals	\$5,000	\$5,000	\$5,000	\$5,000	\$20,000
6.00	Wood & Plastics					\$0
7.00	Thermal & Moisture Protection	\$89,600	\$34,400	\$29,600	\$11,000	\$164,600
8.00	Door & Windows					\$0
9.00	Finishes					\$0
10.00	Specialties					\$0
11.00	Equipment					\$0
12.00	Furnishings					\$0
13.00	Special Construction					\$0
14.00	Conveying Systems					\$0
15.00	Mechanical HVAC & Plumbing					\$0
16.00	Electrical	\$326,368	\$0	\$0	\$0	\$326,368
17.00	Instruments & Controls	\$116,680	\$37,631	\$37,632	\$37,632	\$229,575
18.00	Process Piping & Equipment	\$1,331,505	\$784,365	\$924,335	\$828,665	\$3,868,870
<b>Sub Total</b>		<b>\$1,959,553</b>	<b>\$861,396</b>	<b>\$996,567</b>	<b>\$882,297</b>	<b>\$4,699,813</b>
	Tax & Freight	\$99,669	\$41,722	\$48,676	\$41,722	\$231,789
	General Conditions	\$164,738	\$72,249	\$83,619	\$73,922	\$394,528
	General Contractor Mark-Up	\$222,396	\$97,537	\$112,886	\$99,794	\$532,613
<b>Field Costs - Sub Total</b>		<b>\$2,446,356</b>	<b>\$1,072,904</b>	<b>\$1,241,748</b>	<b>\$1,097,735</b>	<b>\$5,858,743</b>
	Design Fee Allowance	366,953	160,936	186,262	164,660	\$878,812
	Construction Management Allowance	\$73,391	\$32,187	\$37,252	\$32,932	\$175,762
	Plan Check & Permit Fee Allowance	\$777	\$325	\$380	\$325	\$1,808
	Third Party Inspection Allowance	\$583	\$244	\$285	\$244	\$1,356
	Escalation	\$112,069	\$50,101	\$59,830	\$54,113	\$276,113
	Project Contingency	\$847,578	\$354,800	\$413,934	\$354,800	\$1,971,112
<b>Sub Total</b>		<b>\$3,847,708</b>	<b>\$1,671,498</b>	<b>\$1,939,691</b>	<b>\$1,704,809</b>	<b>\$9,163,707</b>
	Owners Costs	\$36,695	\$16,094	\$18,626	\$16,466	\$87,881
	Round Off	-\$404	\$409	-\$318	-\$275	-\$588
<b>GRAND TOTAL</b>		<b>\$3,884,000</b>	<b>\$1,688,000</b>	<b>\$1,958,000</b>	<b>\$1,721,000</b>	<b>\$9,251,000</b>

Prepared By:

*[Signature]*

Date:

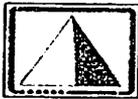
6/24/05

Approved By:

*[Signature]*

Date:

6/24/05



Eichleay Engineers Inc. of California

**ESTIMATE SUMMARY SHEET**

Client Name: Wine Institute

Estimated By: P.H.M.

Job Number: 30913

**PRELIMINARY ESTIMATE**

Checked By: R.H.

Job Title: Fermenter VOC Emissions - LIVINGSTON UTILITIES

Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	W/O ESCALATION & OWNERS COSTS				TOTAL
		TOTAL COSTS				
		RTO-1	RTO-2	RTO-3	RTO-4	
<b>SUMMARY</b>						
2.00	Site Construction	\$9,350	\$0	\$0	\$0	\$9,350
3.00	Concrete	\$81,050	\$0	\$0	\$0	\$81,050
4.00	Masonry					\$0
5.00	Metals	\$5,000	\$5,000	\$5,000	\$5,000	\$20,000
6.00	Wood & Plastics					\$0
7.00	Thermal & Moisture Protection	\$89,600	\$34,400	\$29,600	\$11,000	\$164,600
8.00	Door & Windows					\$0
9.00	Finishes					\$0
10.00	Specialties					\$0
11.00	Equipment					\$0
12.00	Furnishings					\$0
13.00	Special Construction					\$0
14.00	Conveying Systems					\$0
15.00	Mechanical HVAC & Plumbing					\$0
16.00	Electrical	\$326,368	\$0	\$0	\$0	\$326,368
17.00	Instruments & Controls	\$116,680	\$37,631	\$37,632	\$37,632	\$229,575
18.00	Process Piping & Equipment	\$1,331,505	\$784,365	\$924,335	\$828,665	\$3,868,870
	<b>Sub Total</b>	<b>\$1,959,553</b>	<b>\$861,396</b>	<b>\$996,567</b>	<b>\$882,297</b>	<b>\$4,699,813</b>
	Tax & Freight	\$99,669	\$41,722	\$48,676	\$41,722	\$231,789
	General Conditions	\$164,738	\$72,249	\$83,619	\$73,922	\$394,528
	General Contractor Mark-Up	\$222,396	\$97,537	\$112,886	\$99,794	\$532,613
	<b>Field Costs - Sub Total</b>	<b>\$2,440,356</b>	<b>\$1,072,904</b>	<b>\$1,241,748</b>	<b>\$1,097,735</b>	<b>\$5,858,743</b>
	Design Fee Allowance	366,953	160,936	186,262	164,660	\$878,812
	Construction Management Allowance	\$73,391	\$32,187	\$37,252	\$32,932	\$175,762
	Plan Check & Permit Fee Allowance	\$777	\$325	\$380	\$325	\$1,808
	Third Party Inspection Allowance	\$583	\$244	\$285	\$244	\$1,356
	Escalation					\$0
	Project Contingency	\$847,578	\$354,800	\$413,934	\$354,800	\$1,971,112
	<b>Sub Total</b>	<b>\$3,735,639</b>	<b>\$1,621,397</b>	<b>\$1,879,861</b>	<b>\$1,650,697</b>	<b>\$8,887,593</b>
	Owners Costs					\$0
	Round Off	\$407				\$407
	<b>GRAND TOTAL</b>	<b>\$3,736,046</b>	<b>\$1,621,397</b>	<b>\$1,879,861</b>	<b>\$1,650,697</b>	<b>\$8,888,000</b>

Prepared By:

*P.H.M.*

Date:

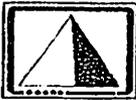
6/24/05

Approved By

*R.W. Medges*

Date:

6/24/05



Eichleay Engineers Inc. of California

**ESTIMATE SUMMARY SHEET**

Client Name: Wine Institute

Estimated By: P.H.M.

Job Number: 30913

**PRELIMINARY ESTIMATE**

Checked By: R.H.

Job Title: Fermenter VOC Emissions - LIVINGSTON UTILITIES

Rev. 2

Date: 6/24/05

CODE	ITEM DESCRIPTION	TOTAL MHR	W/O Escalation & Owners Costs			TOTAL
			LABOR	MAT'L	SUBCON.	
<b>SUMMARY</b>						
2.00	Site Construction		\$0	\$0	\$9,350	\$9,350
3.00	Concrete		\$0	\$0	\$81,050	\$81,050
4.00	Masonry		\$0	\$0	\$0	\$0
5.00	Metals		\$0	\$0	\$20,000	\$20,000
6.00	Wood & Plastics		\$0	\$0	\$0	\$0
7.00	Thermal & Moisture Protection		\$0	\$0	\$164,600	\$164,600
8.00	Door & Windows		\$0	\$0	\$0	\$0
9.00	Finishes		\$0	\$0	\$0	\$0
10.00	Specialties		\$0	\$0	\$0	\$0
11.00	Equipment		\$0	\$0	\$0	\$0
12.00	Furnishings		\$0	\$0	\$0	\$0
13.00	Special Construction		\$0	\$0	\$0	\$0
14.00	Conveying Systems		\$0	\$0	\$0	\$0
15.00	Mechanical HVAC & Plumbing		\$0	\$0	\$0	\$0
16.00	Electrical		\$135,577	\$181,792	\$9,000	\$326,368
17.00	Instruments & Controls		\$78,975	\$150,600	\$0	\$229,575
18.00	Process Piping & Equipment		\$2,066,090	\$1,774,780	\$28,000	\$3,868,870
	<b>Sub Total</b>		<b>\$2,280,642</b>	<b>\$2,107,172</b>	<b>\$312,000</b>	<b>\$4,699,813</b>
	Tax & Freight (11%)					\$231,789
	General Conditions (8%)					\$394,528
	General Contractor Mark-Up (10%)					\$532,613
	<b>Field Costs - Sub Total</b>					<b>\$5,858,743</b>
	Design Fee Allowance (15%)					\$878,811
	Construction Management Allowance (3%)					\$175,762
	Plan Check & Permit Fee Allowance (2%)					\$1,808
	Third Party Inspection Allowance (1.5%)					\$1,356
	Escalation					
	Project Contingency					\$1,971,112
	<b>Sub Total</b>					<b>\$8,887,593</b>
	Owners Costs					\$0
	Round Off					\$407
	<b>GRAND TOTAL</b>					<b>\$8,888,000</b>

Prepared By:

*Paul H. Meyer*  
6/24/05

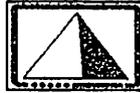
Date:

Approved By

*R. W. Hedger*  
6/24/05

Date:





**Eichler & Associates**  
Engineers Inc. of CA

Client Name: Wine Institute  
 Job Number: 30913  
 Job Title: Fermenter VOC Emissions - LIVINGSTON UTILITIES

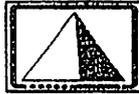
**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
 Checked By: R.H.  
 Rev. 2 Date: 6/24/05

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CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	030 - Concrete												
1	Install foundation for KOH system	133	cy					450.00	450.00			59,850	59,850
1	Install curb around KOH system	23	cy					550.00	550.00			12,650	12,650
1	Install foundation for Air compressor / air dryer	9	cy					450.00	450.00			4,050	4,050
1	Allowance for electrical equipment foundations	10	cy					450.00	450.00			4,500	4,500
<b>TOTAL - Concrete</b>											81,050	81,050	





**Eichle**  
Engineers Inc. of CA

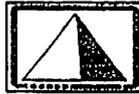
Client Name: Wine Institute  
Job Number: 30913  
Job Title: Fermenter VOC Emissions - LIVINGSTON UTILITIES

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
Checked By: R.H.  
Rev. 2 Date: 6/24/05

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CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	070 - Thermal & Moisture Protection												
all	Allowance for insulation for tank	1	lot					8,000.00	8,000.00			8,000	8,000
1	Allowance for insulation on 4" KOH pipe	2920	ft					30.00	30.00			87,600	87,600
2	Allowance for insulation on 4" KOH pipe	1080	ft					30.00	30.00			32,400	32,400
3	Allowance for insulation on 4" KOH pipe	920	ft					30.00	30.00			27,600	27,600
4	Allowance for insulation on 4" KOH pipe	300	ft					30.00	30.00			9,000	9,000
<b>TOTAL - Thermal &amp; Moisture Protection</b>											164,600	164,600	



**Eichler**  
Engineers Inc. of CA

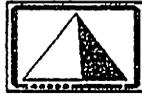
Client Name: Wine Institute  
 Job Number: 30913  
 Job Title: Fermenter VOC Emissions - LIVINGSTON UTILITIES

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
 Checked By: R.H.  
 Rev. 2 Date: 6/24/05

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CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
<b>016 - Electrical</b>													
1	MOTOR CONTROL CENTER STRUCTURE	1	EA	10	10	75.00	1,800.00		2,550.00	750	1,800		2,550
1	200A MAIN BREAKER	1	EA	4.21	4	75.00	710.00		1,025.75	316	710		1,026
1	STARTER SIZE 1 480VAC MCC BOX	1	EA	2.9	3	75.00	945.00		1,162.50	218	945		1,163
1	STARTER SIZE 2 480VAC MCC BOX	1	EA	4	4	75.00	1,075.00		1,375.00	300	1,075		1,375
1	STARTER SIZE 3 480VAC MCC BOX	1	EA	8	8	75.00	1,800.00		2,400.00	600	1,800		2,400
1	CHECKOUT AND TESTING	1	LOT	40	40	75.00			3,000.00	3,000			3,000
<b>POWER DISTRIBUTION</b>													
1	TRANSFORMER 1500KVA 15KV/480V	1	EA	100	100	75.00	27,500.00		35,000.00	7,500	27,500		35,000
1	DISCONNECT SWITCH 15KV	1	EA	56	56	75.00	17,500.00		21,700.00	4,200	17,500		21,700
1	15KV 1/0 CONDUCTOR	60	CLF	4.211	253	75.00	215.00		530.83	18,950	12,900		31,850
1	15KV LOAD BREAK DISC. & UTILITY CONNECTION	1	LOT	100	100	75.00	39,800.00		47,300.00	7,500	39,800		47,300
1	3" RIGID ALUMINUM	2000	LF	0.18	360	75.00	10.50		24.00	27,000	21,000		48,000
1	24X36X42 PULL BOX	30	EA	10.5	315	75.00	885.00		1,672.50	23,625	26,550		50,175
1	3" 90-DEGREE ELBOWS	2	EA	1.9	4	75.00	69.00		211.50	285	138		423
1	3" IN-LINE FITTINGS	2	EA	2.9	6	75.00	415.00		632.50	435	830		1,265
1	MISC SUPPORTS, FITTINGS, TERMINATIONS	1	LOT							17,899	29,244		47,143
1	CHECKOUT AND TESTING	1	LOT	40	40	75.00			3,000.00	3,000			3,000
1	Allowance for trenching power cable	300	ft					30.00	30.00			9,000	9,000
1	Allowance for overtime	1	lot	200	200	100.00			20,000.00	20,000			20,000
<b>TOTAL - Electrical</b>					<b>1502</b>					<b>135,577</b>	<b>181,792</b>	<b>9,000</b>	<b>326,369</b>



**Eichle** /  
Engineers Inc. of CA

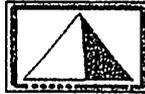
Client Name: Wine Institute  
 Job Number: 30913  
 Job Title: Fermenter VOC Emissions - LIVINGSTON UTILITIES

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
 Checked By: R.H.  
 Rev. 2 Date: 6/24/05

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CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	<b>017 - Instruments &amp; Controls</b>												
	2% KOH equipment												
1	Conservation vents	2	ea	4	8	75.00	1,200.00		1,500.00	600	2,400		3,000
1	Relief vents	2	ea	2	4	75.00	3,000.00		3,150.00	300	6,000		6,300
1	Level transmitter & indicator	2	ea	4	8	75.00	1,200.00		1,500.00	600	2,400		3,000
1	High level switch	1	ea	2	2	75.00	500.00		650.00	150	500		650
1	Pressure gauge	6	ea	1	6	75.00	300.00		375.00	450	1,800		2,250
1	Pressure transmitter		ea			75.00	2,100.00		2,100.00				
1	temperature gauge & TW	6	ea	4	24	75.00	300.00		600.00	1,800	1,800		3,600
1	Temperature transmitter, RTD, TW	1	ea	4	4	75.00	1,200.00		1,500.00	300	1,200		1,500
1	Temperature control valve	1	ea	6	6	75.00	1,800.00		2,250.00	450	1,800		2,250
1	Relief valves	2	ea	2	4	75.00	300.00		450.00	300	600		900
1	Pressure regulator, liquid	1	ea	2	2	75.00	300.00		450.00	150	300		450
1	Pressure regulator, steam	1	ea	2	2	75.00	1,500.00		1,650.00	150	1,500		1,650
1	Sight glass	2	ea	4	8	75.00	1,000.00		1,300.00	600	2,000		2,600
1	Totalizing mass flow meter	2	ea	6	12	75.00	25,000.00		25,450.00	900	50,000		50,900
	CIP instruments												
all	pressure gauge	158	ea	1	158	75.00	180.00		255.00	11,850	28,440		40,290
all	Install control valves for KOH & water lines	120	ea	2	240	75.00	250.00		400.00	18,000	30,000		48,000
all	Install conduit to valves	3000	ft	0.1	300	75.00	3.00		10.50	22,500	9,000		31,500
all	Install wire to valve	60	ea	1	60	75.00	5.00		80.00	4,500	300		4,800
all	Install dual manual switch at grade per tank	60	ea	1	60	75.00	120.00		195.00	4,500	7,200		11,700
all	Install conduit for power to switch	1000	ft	0.1	100	75.00	3.00		10.50	7,500	3,000		10,500
all	Install wire to switch	3000	ft	0.015	45	75.00	0.12		1.25	3,375	360		3,735
	<b>TOTAL - Instruments &amp; Controls</b>				1053					78,975	150,600		229,575



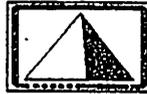
**Eichleay**  
Engineers Inc. of CA

Client Name: Wine Institute  
Job Number: 30913  
Job Title: Fermenter VOC Emissions - LIVINGSTON UTILITIES

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
Checked By: R.H.  
Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	<b>018 - Process Piping &amp; Equipment</b>												
	2% KOH equipment												
1	50% tank	1	ea	4	4	65.00	13,800.00		14,060.00	260	13,800		14,060
1	50% pump	1	ea	6	6	65.00	2,530.00		2,920.00	390	2,530		2,920
1	50% filter	2	ea	2	4	65.00	1,380.00		1,510.00	260	2,760		3,020
1	2% tank	1	ea	10	10	65.00	46,920.00		47,570.00	650	46,920		47,570
1	2% pump	1	ea	6	6	65.00	5,750.00		6,140.00	390	5,750		6,140
1	2% eductor	1	ea	10	10	65.00	1,150.00		1,800.00	650	1,150		1,800
1	2% heat exchanger	1	ea	4	4	65.00	2,990.00		3,250.00	260	2,990		3,250
1	2% filter	2	ea	2	4	65.00	1,840.00		1,970.00	260	3,680		3,940
1	Crane for installing KOH equipment	1	lot					3,000.00	3,000.00			3,000	3,000
	<b>CIP Equipment</b>												
1	Spray nozzles (ducting)	235	ea	2	470	65.00	250.00		380.00	30,550	58,750		89,300
1	Spray nozzles (KO Pots)	6	ea	2	12	65.00	300.00		430.00	780	1,800		2,580
1	Spray nozzels for main ducting	107	ea	2	214	65.00	250.00		380.00	13,910	26,750		40,660
1	install sanitize inductors for in main ducting	55	ea	2	110	65.00	300.00		430.00	7,150	16,500		23,650
1	Allowance for valves for KOH & water clean out	428	ea	4	1712	65.00	150.00		410.00	111,280	64,200		175,480
2	Spray nozzles (ducting)	235	ea	2	470	65.00	250.00		380.00	30,550	58,750		89,300
2	Spray nozzles (KO Pots)	6	ea	2	12	65.00	300.00		430.00	780	1,800		2,580
2	Spray nozzels for main ducting	116	ea	2	232	65.00	250.00		380.00	15,080	29,000		44,080
2	install sanitize inductors for in main ducting	58	ea	2	116	65.00	300.00		430.00	7,540	17,400		24,940
2	Allowance for valves for KOH & water clean out	464	ea	4	1856	65.00	150.00		410.00	120,640	69,600		190,240
3	Spray nozzles (ducting)	235	ea	2	470	65.00	250.00		380.00	30,550	58,750		89,300
3	Spray nozzles (KO Pots)	6	ea	2	12	65.00	300.00		430.00	780	1,800		2,580
3	Spray nozzels for main ducting	189	ea	2	378	65.00	250.00		380.00	24,570	47,250		71,820
3	install sanitize inductors for in main ducting	95	ea	2	190	65.00	300.00		430.00	12,350	28,500		40,850
3	Allowance for valves for KOH & water clean out	756	ea	4	3024	65.00	150.00		410.00	196,560	113,400		309,960
4	Spray nozzles (ducting)	235	ea	2	470	65.00	250.00		380.00	30,550	58,750		89,300



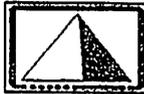
**Eichle**  
Engineers Inc. of CA

Client Name: Wine Institute  
Job Number: 30913  
Job Title: Fermenter VOC Emissions - LIVINGSTON UTILITIES

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
Checked By: R.H.  
Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
4	Spray nozzles (KO Pots)	6	ea	2	12	65.00	300.00		430.00	780	1,800		2,580
4	Spray nozzels for main ducting	178	ea	2	356	65.00	250.00		380.00	23,140	44,500		67,640
4	install sanitize inductors for in main ducting	90	ea	2	180	65.00	300.00		430.00	11,700	27,000		38,700
4	Allowance for valves for KOH & water clean out	712	ea	4	2848	65.00	150.00		410.00	185,120	106,800		291,920
	Install sanitize system at each tank												
all	install 1 1/2" PP pipe	4800	ft	0.3	1440	65.00	3.00		22.50	93,600	14,400		108,000
all	Install inductor	60		2	120	65.00	300.00		430.00	7,800	18,000		25,800
1 & 2	Allowance for a sanitize cart for main duct cleaning	2	ea					2,500.00	2,500.00			5,000	5,000
	Utility Equipment												
1	Air compressor, oil free, 180cfm, 50 HP	2	ea	10	20	65.00	42,000.00		42,650.00	1,300	84,000		85,300
1	Air dryer, reciever tank and filters, 180cfm	2	ea	10	20	65.00	14,200.00		14,850.00	1,300	28,400		29,700
1	Allowance to install 2" natural gas pipe	1060	ft	1.2	1272	65.00	5.00		83.00	82,680	5,300		87,980
1	Allowance for natural gas valves & fittings	1	lot					2,000.00	2,000.00		2,000		2,000
all	Allowance to install 2" air line feeding the VOC's	500	ft	1.2	600	65.00	5.00		83.00	39,000	2,500		41,500
all	Allowance for air line valves & fittings	1	lot					6,000.00	6,000.00		6,000		6,000
all	Allowance to install 2" local water line to each tank	1800	ft	1	1800	65.00	5.00		70.00	117,000	9,000		126,000
all	Allowance to install 2" valves & fittings for water line	60	ea	4	240	65.00	120.00		380.00	15,600	7,200		22,800
1	Allowance to install 3" water line to KOH / main rack	800	ft	0.6	480	65.00	6.00		45.00	31,200	4,800		36,000
1	Fab & install 4" KOH line for main duct for system 1	1180	ft	1	1180	65.00	50.00		115.00	76,700	59,000		135,700
1	Fab & install 4" KOH line for tanks in system 1	1740	ft	1	1740	65.00	50.00		115.00	113,100	87,000		200,100



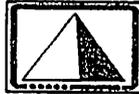
**Eichler**  
Engineers Inc. of CA

Client Name: Wine Institute  
 Job Number: 30913  
 Job Title: Fermenter VOC Emissions - LIVINGSTON UTILITIES

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
 Checked By: R.H.  
 Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
2	Fab & install 4" KOH line for main duct for system 2	330	ft	1	330	65.00	50.00		115.00	21,450	16,500		37,950
2	Fab & install 4" KOH line for tanks in system 2	750	ft	1	750	65.00	50.00		115.00	48,750	37,500		86,250
3	Fab & install 4" KOH line for main duct for system 3	160	ft	1	160	65.00	50.00		115.00	10,400	8,000		18,400
3	Fab & install 4" KOH line for tanks in system 3	760	ft	1	760	65.00	50.00		115.00	49,400	38,000		87,400
4	Fab & install 4" KOH line for main duct for system 4		ft			65.00	50.00		50.00				
4	Fab & install 4" KOH line for tanks in system 4	300	ft	1	300	65.00	50.00		115.00	19,500	15,000		34,500
all	Fab & install 2" drain to tank & ground from duct	60	ea	55	3300	65.00	2,100.00		5,675.00	214,500	126,000		340,500
all	Fab & install 1" CIP line at each duct	60	ea	65	3900	65.00	4,700.00		8,925.00	253,500	282,000		535,500
1	Fab & install 1 1/2" FRP piping	1	ea	48	48	65.00	4,000.00		7,120.00	3,120	4,000		7,120
1	Fab & install 2" FRP piping	1	ea	34	34	65.00	2,500.00		4,710.00	2,210	2,500		4,710
1	Allowance for 4" ss pipe at KOH unit	1	lot	100	100	65.00	5,000.00		11,500.00	6,500	5,000		11,500
all	Allowance for small crane / fork lift for piping work	1	lot					20,000.00	20,000.00			20,000	20,000
<b>TOTAL - Process Piping &amp; Equipment</b>					<b>31735</b>					<b>2,066,090</b>	<b>1,774,780</b>	<b>28,000</b>	<b>3,868,870</b>



**Eichle**  
Engineers Inc. of CA

Client Name: Wine Institute  
 Job Number: 30913  
 Job Title: Fermenter VOC Emissions - LIVINGSTON UTILITIES

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
 Checked By: R.H.  
 Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	Contingency												
2.00	Site Construction					25%	25%	25%				2,338	2,338
3.00	Concrete					30%	30%	30%				24,315	24,315
4.00	Masonry					25%	25%	25%					
5.00	Metals					25%	30%	25%				5,000	5,000
6.00	Wood & Plastics					25%	25%	25%					
7.00	Thermal & Moisture Protection					25%	25%	25%				41,150	41,150
8.00	Door & Windows					25%	25%	25%					
9.00	Finishes					25%	25%	25%					
10.00	Specialties					25%	25%	25%					
11.00	Equipment					25%	25%	25%					
12.00	Furnishings					25%	25%	25%					
13.00	Special Construction					25%	25%	25%					
14.00	Conveying Systems					25%	25%	25%					
15.00	Mechanical HVAC & Plumbing					25%	25%	25%					
16.00	Electrical					35%	35%	35%		47,452	63,627	3,150	114,229
17.00	Instruments & Controls					30%	30%	30%		23,693	45,180		68,873
18.00	Process Piping & Equipment					35%	35%	35%		723,132	621,173	9,800	1,354,105
	Design Fee Allowance							35%				307,584	307,584
	Construction Management Allowance							30%				52,729	52,729
	Plan Check & Permit Fee Allowance							25%				452	452
	Third Party Inspection Allowance							25%				339	339
	ROUND OFF	1											
	<b>TOTAL - Contingency</b>									794,276	729,980	446,856	1,971,112

## **BACT Attachment B**

### **Sizing and Purchase Costs for Control Devices**

## Thermal Oxidizer Equipment Cost

### Thermal Oxidizer Equipment Prices (Without Heat Recovery) Based on EPA Cost Manual Section 3.2, Chapter 2

Case		Equipment Cost	
VOC System	RTO Capacity Basis SCFM (Eichleay Study)	1988 Cost (EPA)	Cost Escalated to 2009 at 3% per Year
1	16,000	\$100,600	\$187,100
2	22,000	\$108,400	\$201,700
3	13,000	\$95,800	\$178,200
4	13,000	\$95,800	\$178,200
Totals			\$745,200

### Regenerative Thermal Oxidizer Equipment Prices (95% Heat Recovery) Based on Quotations Received in Eichleay Study

Case		Equipment Cost	
VOC System	RTO Capacity Basis SCFM (Eichleay Study)	2005 Cost (EPA)	Cost Escalated to 2009 at 3% per Year
1	16,000	\$414,200	\$466,200
2	22,000	\$502,500	\$565,600
3	13,000	\$365,200	\$411,000
4	13,000	\$365,200	\$411,000
Totals			\$1,853,800

**Refrigerated Condenser Sizing with Equipment Cost Based on EPA Cost Manual  
Section 3.1, Chapter 2**

VOC System	RTO Capacity Basis (Eichleay Study)	System Capacity less Combustion Air	Refrigerated Condenser Duty Btu/hour	Refrigerated Condenser Duty Tons	1990 Cost (EPA)	Cost Escalated to 2008 at 3% per Year
1	16000	12,900	3,909,000	326	\$430,200	\$754,400
2	22000	17,800	5,393,000	449	\$526,300	\$922,900
3	13000	10,500	3,182,000	265	\$378,100	\$663,000
4	13000	10,500	3,182,000	265	\$378,100	\$663,000
<b>Total</b>				<b>1,306</b>	<b>\$1,027,200</b>	<b>\$3,003,300</b>

**Condenser Duty Calculation:**

Condenser Duty Basis:	Inlet vapor stream contains a maximum of 16,000 ppmv ethanol at 86 F Condensing Temperature is -12 F, 90% of Ethanol Condensed				
Latent Heat Ethanol	369	Btu/lb			
Vapor Heat Capacity	0.21	Btu/lb			
Latent Heat water	1060	Btu/lb			

**Condenser Heat Balance Based on 100 moles of Inlet Vapor:**

		Moles In	Moles Out		Enthalpy Change Btu/100 moles vapor
			Vapor	Liquid	
Ethanol Vapor	1.60	0.16	1.44		-24,594
Water Vapor	4.20	0.00	4.20		-81,783
CO2	94.20	94.20	0.00		-85,319
Sub Total	100.00	94.36	5.64		-191,696
Total	100.00		100.00		-191,696
-191696	Btu/100 moles	=	-5.05	Btu/scf	

**Carbon Adsorption Equipment Prices Based on Technical Assessment Document\***

Equipment Capacity			Equipment Cost	
VOC System	RTO Capacity Basis SCFM (Eichleay Study)	Absorption Capacity Basis SCFM (Without Combustion Air)	1994 Cost (TAD)	Cost Escalated to 2008 at 3% per Year
1	16,000	12,900	\$268,655	\$419,000
2	22,000	17,800	\$305,546	\$476,000
3	13,000	10,500	\$247,914	\$386,000
4	13,000	10,500	\$247,914	\$386,000
Totals				\$1,667,000

\* Technical Assessment Document p.77

**Water Scrubber Equipment Prices Based on STI Study\***

Case			Site Specific, CIP, Maximum Vapor Rate	
VOC System	RTO Capacity Basis SCFM (Eichleay Study)	Absorption Capacity Basis SCFM (Without Combustion Air)	2003 Cost (STI)	Cost Escalated to 2008 at 3% per Year
1	16,000	12,900	\$63,822	\$99,000
2	22,000	17,800	\$71,387	\$111,000
3	13,000	10,500	\$59,411	\$93,000
4	13,000	10,500	\$59,411	\$93,000
Totals			0	\$396,000

\* STI Study, p. 21

**BACT Attachment C**  
**Utilities and Other Annual Costs**

## Costs for Utilities and Other Annual Operating Expenses

Costs for utilities and other annual costs are summarized in the tables on the following two pages. The basis and calculation of the costs is presented below:

### **Natural Gas – applicable to Cases 1, 2 and 5 only**

#### Case 1: Thermal Oxidizer with no heat recovery

The estimate is based on the Eichleay Study which estimated the annual fuel consumption for 95% thermally efficient oxidizers at 67,412 therms/year = 6,741 MMBtu/year. At a natural gas cost of \$8.00/MMBtu, the annual cost is 6,714 x \$8.00 = \$53,900 per year for all four regenerative thermal oxidizers with 95% heat recovery. Dividing by (1-95%) yields the fuel cost for a unit with zero heat recovery:

$$\text{Case 1 Fuel Cost} = \$53900/(1-95\%) = \mathbf{\$1,078,000 \text{ per year}}$$

#### Case 2: Regenerative Thermal Oxidizers

Case 2 is the Eichleay Study case. Therefore,

$$\text{Case 2 Fuel Cost} = \mathbf{\$53,900 \text{ per year}}$$

#### Case 5 – Carbon Adsorption

As calculated elsewhere in this document, the carbon adsorption system will adsorb 350.62 tons per year of VOC's. Per the TAD, 11,800 lb of steam is required to recover 1 ton of ethanol. Given a boiler fuel requirement of 1,350 Btu/lb (based on absorbed boiler duty of 1,080 Btu/lb to produce 100 psig steam from 60 F water and an 80% combustion efficiency), annual fuel consumption for recovery of 350.62 tons ethanol per year is  $11,800 \times 350.62 \times 1,350/10^6 = 5,585$  MMBtu/year.

$$\text{Case 5 Fuel Cost} = 5,585 \text{ MMBtu/year} \times \$8.00/\text{MMBtu} = \mathbf{\$44,700 \text{ per year}}$$

### **Electric Power**

#### Cases 1 and 2 – Thermal Oxidizers

For these cases, power consumption is considered to be only that for the ID fans. Per the Eichleay study, annual power consumption for the ID fans associated with the thermal oxidizers is 586 kw per hour for the 120 day crush season. Annual cost at a unit power cost of \$0.11/kwh is therefore

$$586 \times 120 \times 24 \times \$0.11 = \mathbf{\$185,600 \text{ per year}}$$

### Cases 4 and 5 – Carbon Adsorption and Water Scrubber

As in cases 1 and 2 above, only the ID fan power will be considered for these cases. However, these cases do not have to handle the extra 23.6% combustion air. Therefore, the electric power cost for the thermal oxidizer case will be divided by 1.236 to reflect lower flow rates. On this basis, Cases 3, 4 and 5 have an annual power cost of

$\$185,600/1.236 = \mathbf{\$150,200}$  per year (for cases 4 and 5)

### Case 3 – Refrigerated Condenser

Electric power for this case includes the same ID fan power consumption as Cases 4 and 5 and also requires power for operation of the refrigeration unit. This case requires 1,306 tons of refrigeration for the design case and a utilization factor of 60 % will be assumed. Additionally, a coefficient of performance of 3.5 will be assumed for the equipment. Power demand for a 120 day operating season is thus:

$$60\% \times 1,306/3.5 \times 12,000 \text{ Btu/ton} \times 1 \text{ kW}/3,413 \text{ Btu} \times 120 \text{ days} \times 24 \text{ hr/day} \\ = 2,267,000 \text{ kWh/year}$$

At \$0.11/kWh, the cost for the refrigeration power is \$249,400. Adding \$150,200 for ID fan power (calculated above), total power cost for this case is **\$399,600 per year**.

### **Water Disposal Cost – applicable to Case 4 and 5 only**

#### Case 4 – Water Scrubber

Water disposal requirements and costs for Case 4 (water scrubber) are taken from the STI Study:

- Water Disposal Required: 6 gpm for each 5000 scfm air flow for 90 day crush season.
- Disposal Cost: \$0.25/gallon

Total airflow for all four systems, corrected to subtract the combustion air, is  $(16,000 + 22,000 + 13,000 + 13,000)/1.236 = 51,800$  scfm

$$\text{Wastewater Rate} = 51,800 \text{ scfm} \times 6 \text{ gpm}/5,000 \text{ scf} = 62 \text{ gpm}$$

$$\text{Annual wastewater generation} = 62 \text{ gpm} \times 90 \text{ days} \times 1,440 \text{ minutes/day} \\ = 8,035,000 \text{ gallons per year}$$

$$\text{Annual water disposal cost} = 8,035,000 \text{ gallons} \times \$0.25/\text{gallon} = \mathbf{\$ 2,008,800/yr}$$

### Case 5 - Carbon Adsorption

Wastewater is generated from the regeneration of the carbon bed. Per the TAD, 11,800 lb steam is required to recover 1 ton of ethanol. Given liquid densities of 8.34 and 6.61 lb/gallon for water and ethanol respectively, the amount of wastewater produced per ton of ethanol recovered is  $(11,800/8.34) + (2,000/6.61) = 1,718$  gal/ton ethanol.

As calculated in this BACT analysis, the carbon adsorption unit will adsorb 350.62 tons per year of VOC's. Produced wastewater is therefore  $350.62 \text{ tons} \times 1,718 \text{ gal/ton} = 602,400$  gallons per year.

Disposal cost at \$0.25/gal is  $602,400 \times \$0.25 = \mathbf{\$150,600}$  per year

#### **Carbon Replacement Cost - applicable to Case 5 only**

Per the TAD, activated carbon adsorbs 18% of its weight in ethanol. However, with regeneration, approximately 1/3 of the ethanol initially adsorbed stays on the carbon bed. In addition, due to the seasonal operation of a winery, the carbon is expected to have a lifetime of 10 years.

As calculated in this BACT analysis, the carbon adsorption unit will adsorb 350.62 tons per year of VOC's. Assuming this occurs over a 120 day crush season with three regenerations per day, the amount adsorbed per cycle is  $350.62/(120 \times 3) = 0.97$  tons/cycle = 1,940 lb-VOC/cycle. Assuming a daily regeneration cycle and allowing for a dual bed for regeneration purposes, the amount of carbon required for the facility is  $2 \times 1,940/(18\% \times .667) = 32,300$  lb carbon.

Given a cost of \$2/lb for carbon and annualizing the cost over the 10 year life,

Carbon Replacement Cost =  $0.163 \times \$2.00 \times 32,300 = \mathbf{\$10,500}$  per year.

#### **Cooling Water Cost – applicable to Case 5 only (carbon adsorption)**

Based on values presented in the TAD, the following parameters apply:

Cooling water consumption = 82,600 gallons of cooling water per ton of VOC adsorbed

Cooling Water Unit Cost = \$0.53 per 1000 gallons

Given 350.62 tons of VOC adsorbed per year, annual cost for cooling water is

$82,600 \times 350.62 \times \$0.53/1000 = \mathbf{\$15.800}$  per year

**Utilities and Other Annual Costs**

<b>Control Device</b>	<b>Case 1 Thermal Ox</b>	<b>Case 2 RTO</b>	<b>Case 3 Refrigerated Cond.</b>	<b>Case 4 Water Scrubber</b>	<b>Case 5 Carbon Adsorption</b>
Natural Gas	\$1,078,000	\$53,900	\$0	\$0	\$44,700
Electricity	\$185,600	\$185,600	\$399,600	\$185,600	\$185,600
Water Disposal	\$0	\$0	\$0	\$2,008,800	\$150,600
Cooling Water	\$0	\$0	\$0	\$0	\$15,800
Carbon Replacement	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$10,500</u>
<b>Total</b>	<b>\$1,263,600</b>	<b>\$239,500</b>	<b>\$399,600</b>	<b>\$2,194,400</b>	<b>\$407,200</b>

## **Appendix J**

### **BACT Guideline 5.4.13 and Top-Down Analysis for Wine Storage Tanks**

San Joaquin Valley  
Unified Air Pollution Control District

**Best Available Control Technology (BACT) Guideline 5.4.13\***

Last Update: 10/6/2009

**Wine Storage Tank**

Pollutant	Achieved in Practice or contained in the SIP	Technologically Feasible	Alternate Basic Equipment
VOC	1. Insulation or Equivalent**, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation; and continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of completion of fermentation.	1. Capture of VOCs and thermal or catalytic oxidation or equivalent (98% control)  2. Capture of VOCs and carbon adsorption or equivalent (95% control)  3. Capture of VOCs and absorption or equivalent (90% control)  4. Capture of VOCs and condensation or equivalent (70% control)	

\*\*Tanks made of heat-conducting materials such as stainless steel may be insulated or stored indoors (in a completely enclosed building, except for vents, doors and other essential openings) to limit exposure of diurnal temperature variations. Tanks made entirely of non-conducting materials such as concrete and wood (except for fittings) are considered self-insulating.

BACT is the most stringent control technique for the emissions unit and class of source. Control techniques that are not achieved in practice or contained in a state implementation plan must be cost effective as well as feasible. Economic analysis to demonstrate cost effectiveness is required for all determinations that are not achieved in practice or contained in an EPA approved State Implementation Plan.

**\*This is a Summary Page for this Class of Source - Permit Specific BACT Determinations on Next Page(s)**

## Top-Down BACT Analysis for VOC Emissions from Wine Storage Tanks

### Step 1 - Identify All Possible Control Technologies

The SJVUAPCD BACT Clearinghouse Guideline 5.4.13 identifies achieved-in-practice BACT for wine fermentation as 'Insulation or Equivalent, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum working pressure of the tank; "gas-tight" tank operation; and continuous storage temperature not exceeding 75 degrees F, achieved within 60 days of completion of fermentation'.

The following technologically feasible controls are identified in the BACT Guideline:

1. Capture of VOCs and thermal or catalytic oxidation
2. Capture of VOCs and carbon adsorption or equivalent
3. Capture of VOCs and absorption or equivalent
4. Capture of VOCs and condensation or equivalent

There are no controls identified under the Alternate Basic Equipment category.

### Step 2 - Eliminate Technologically Infeasible Options

All of the options listed above are considered to be technologically feasible.

### Step 3 - Rank Remaining Control Technologies by Control Effectiveness

The options enumerated above can be ranked as follows:

Rank by Control Effectiveness			
Rank	Option	Control	Overall Capture & Control Efficiency <sup>(*)</sup>
1	1	Capture of VOCs and thermal or catalytic oxidation	98 % <sup>(**)</sup>
2	2	Capture of VOCs and carbon adsorption	95 %
3	3	Capture of VOCs and absorption.	90 %
4	4	Capture of VOCs and condensation	70 %
5	Achieved in practice BACT		-

(\*) Capture efficiency (90%) x removal efficiency for control device

(\*\*) Following recent District practice, thermal and catalytic oxidation will be ranked together.

#### Step 4 - Cost Effectiveness Analysis

A cost effectiveness analysis is performed for each control technology which is more effective than achieved-in-practice BACT. The cost-effectiveness analysis will be performed based on the following:

- Since the most cost effective approach will be achieved by installing a common control device for multiple tanks, the analysis will be based on this approach.
- To expand the scope and generality of this BACT, the cost-effectiveness analysis will be based on a hypothetical "industry-typical" storage tank operation consisting of a battery of twelve (12) storage tanks each with a capacity of 200,000 gallons. Total annual throughput for the hypothetical tank battery is 39.6 million gallons per year based on an individual annual throughput of 3,300,000 gallons per year each (equivalent to almost 17 turns per year of each storage tank versus an estimated industry average of 6 turns per tank<sup>1</sup>). Total throughput subject to VOC control by a common VOC control device is thus 39.6 MMgal/year. Based on economies of scale, it is obvious that any control found not to be cost-effective at this level of throughput would be even less cost-effective at lower capacities.

#### Industry Standard

During the development of District Rule 4694, it was determined that use of pressure/vacuum valves and some level of refrigeration on wine storage tanks is a standard operation for large wineries in the San Joaquin Valley. Additionally, essentially all storage tanks are insulated. This was directly confirmed with four large wineries: Mission Bell (Madera), Gallo-Livingston, Bronco, and Robert Mondavi. Based on this, the wine storage tank VOC control requirements of District Rule 4694 and tank insulation are also determined to be "industry standard".

Although exempt from the rule requirements, concrete and wood tanks also conform to these industry standards. Since concrete and wood are materials of poor heat conductivity, they are considered self-insulating and therefore usually do not need added insulation as is the case with steel tanks.

The emission factor for "industry standard" operation is determined based on Table 1 of the District's FYI-114, Estimating Emissions from Wine Storage Tanks (BACT Attachment A), for an insulated storage tank with up to 20% ethanol content in the wine being stored:

$$E_f \text{ (industry standard)} = 0.297 \text{ lb-VOC/1000 gal of wine throughput}$$

#### Uncontrolled emissions for Twelve-Tank Battery

$$\begin{aligned} \text{Uncontrolled Emissions} &= \text{Gallons Throughput/year} \times 0.297 \text{ lb-VOC/1000 gallons} \\ &= (39.6 \times 10^6 \text{ gal/year}) \times (0.297 \text{ lb-VOC/1000 gal}) \end{aligned}$$

$$\text{Uncontrolled Emissions} = 11,761 \text{ lb/year}$$

---

<sup>1</sup> Per discussions with the Wine Institute (Bob Calvin of Constellation Wines) during Rule 4694 development (8/16/05)

**Capture of VOCs with Thermal or Catalytic Oxidation/ Carbon Adsorption/Absorption or Condensation (Options 3, 4, 5 and 6)**

A common feature of all of these options is that they require installation of a collection system for delivering the VOCs from the tanks to the common control device. The analysis below indicates that these options are not cost effective by showing that just the annualized direct cost for the ductwork of the collection system and supporting structural steel and foundations alone is too large, when considered at the District's cost effectiveness threshold for VOC BACT, to justify the capital investment required by these options. This approach ignores additional major costs for the actual control device and its installation and for equipment sterilization systems for ductwork and control device, instrumentation and control systems for isolation of individual tanks in the battery, site specific factors due to limited plot space (known to be a significant factor at all wineries), and operating and maintenance costs for each system. Should all these additional cost factors be included, the calculated cost effectiveness would be substantially higher than indicated below.

**a. Control Efficiency**

Option 4 is capable of a 98% reduction in VOC emissions while the remaining options under consideration have lesser control efficiencies. Showing that all of the options under consideration are not cost effective at a 98% reduction level based on capital investment requirements of ductwork and steel alone is adequate since options other than thermal/catalytic oxidation would be even less cost effective at their actual (lower) reduction levels.

$$\begin{aligned} \text{Annual Emission Reduction} &= \text{Uncontrolled Emissions} \times 0.98 \\ &= 11,761 \text{ lb-VOC/year} \times 0.98 \\ &= 11,526 \text{ lb-VOC/year} \\ &= 5.76 \text{ tons-VOC/year} \end{aligned}$$

**b. Capital Investment For Installation of a VOC Collection System**

**Design and Estimate Basis:**

- The collection system consists of stainless steel plate ductwork (stainless steel is required due to food grade product status) with isolation valving, connecting twelve 200,000 gallon tanks to a common manifold system which ducts the combined vent to the common control device. The cost of dampers and isolation valving, installed in the ductwork, will not be included in the cost estimate.
- A minimum duct size is established at 6 inches diameter at each tank to ensure minimal backpressure of the tank during filling operations and to provide adequate strength for spanning between supports. The main header is 12" diameter to handle the potential for simultaneously venting all tanks based on a potential fill rate of 1,000 gpm for each tank (per industry) and a duct velocity of 2,000 feet per minute.
- The ductwork is designed with features to facilitate clean-in-place (CIP) operation to allow for periodic sterilization procedures as required for food grade products. The CIP

system includes strategically placed spray nozzles on the ductwork for injecting sterilizing solutions into the system. Cost impacts to install CIP systems to clean the ducting are not included in the cost estimate.

- The ductwork is supported on a structural steel piperack mounted on drilled concrete piers, running through the tank battery. Ducting elevations are established to allow continuous free draining to the separator located at the control device.
- Unit Installed Costs for Ductwork: A direct cost estimate for 12" diameter stainless steel ductwork, installed in a San Joaquin Valley winery, was taken from a study prepared by Eichleay Engineering for the Wine Institute in conjunction with development of District Rule 4694<sup>2</sup>. The estimate is based on 2nd quarter 2005 dollars, and includes fittings, miscellaneous duct supports and other materials plus field labor costs required to install the ductwork, but does not include other associated indirect costs such as construction management, engineering, owner's cost, contingency, etc. BACT Attachment B presents the development of unit installed costs for stainless steel ducting based on the costs derived from the Eichleay estimate.
- Linear feet of ducting required was extracted from the Eichleay Estimate for a similar system at Gallo-Livingston (see BACT Attachment B).
- Costs for structural steel supports and foundations were extracted from the Eichleay Estimate for a similar system at Gallo-Livingston (see BACT Attachment B).
- Sales tax of 8% was applied to all materials.
- Indirect costs include Engineering, Construction Expense and Contractor's Fee and Contingency. Factors for these costs are taken from Peters & Timmerhaus<sup>3</sup>.

#### Capital Investment (for ductwork and steel supports)

Fixed Capital Investment is summarized in the following table:

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<sup>2</sup> Eichleay Engineers of California, Fermenter VOC Emissions Control Cost Estimate Revision 1), Eichleay Project Numbers 30892 and 30913, June 30, 2005

<sup>3</sup> Peters & Timmerhaus, Plant Design and Economics for Chemical Engineers, 2<sup>nd</sup> Edition, McGraw-Hill, 1968, P. 140

<b>Fixed Capital Investment for Options 3, 4, 5 and 6</b>									
Item	Qty	Unit	Unit Material Cost	Total Item Material Cost	Unit Labor Cost	Total Item Labor Cost	Unit Subcontract Price	Total Item Subcontract Cost	Total Item Direct Cost
<b>Direct Cost</b>									
6" Dia. Ducting	75	ft	\$32.11	\$2,408	\$29.20	\$2,190			\$4,598
12" Dia. Ducting	870	ft	\$75.33	\$65,537	\$68.49	\$59,586			\$125,123
Drilled Piers	32	ea.					\$1,000.00	\$32,000	\$32,000
Structural Steel Supports	1	lot	\$45,273	\$287,630	\$45,273	\$45,273			\$332,903
<b>Direct Cost Subtotals</b>				\$355,575		\$107,049		\$32,000	\$494,624
<b>Sales Tax</b>				\$28,446					\$28,446
<b>Total Direct Cost</b>				\$384,021		\$107,049		\$32,000	\$523,070
<b>Indirect Costs</b>									
Engineering @ 15% of Direct Cost									\$78,461
Construction Expense and Contractor's Fee @ 20% of Direct Cost									\$104,614
Contingency @ 15% of Fixed Capital Investment									\$124,614
<b>Fixed Capital Investment</b>									\$830,759

Annualized Capital Investment and Cost Effectiveness (based on ductwork):

Annualized Capital Investment = Initial Capital Investment x Amortization Factor

Amortization Factor = 0.163 per District policy, amortizing over 10 years at 10%

Therefore,

Annualized Capital Investment = \$830,759 x 0.163 = \$135,414

Cost Effectiveness = Annualized Cost/Annual Emission Reductions

**Cost Effectiveness = \$135,414/5.76 tons-VOC = \$23,509/ton-VOC**

As shown above, the cost of VOC reduction by capture of VOCs with thermal or catalytic oxidation, carbon adsorption, absorption or condensation would be greater than the \$17,500/ton cost effectiveness threshold for VOC in the District BACT policy, based only on the direct cost required for the collection ducting. Therefore these options are not cost-effective and will not be considered for this project.

**Step 5 - Select BACT**

All identified feasible options with control efficiencies higher than the option proposed by the facility have been shown to not be cost effective. The facility has proposed Option 1, *Insulation or Equivalent, Pressure Vacuum Relief Valve (PVRV) set within 10% of the maximum allowable working pressure of the tank; "gas-tight" tank operation; and continuous storage temperature not exceeding 75 °F, achieved within 60 days of completion of fermentation.* These BACT requirements will be placed on the ATCs as enforceable conditions.

Attachments:

- BACT Attachment A: Estimating VOC Emissions From Wine Storage Tanks
- BACT Attachment B: Development of Direct Costs for Installation of a VOC Collection System on a Battery of Wine Storage Tanks
- BACT Attachment C: Ducting, Structural Steel and Foundation Cost Estimates From Eichleay Study

## **BACT Attachment A**

### **Estimating VOC Emissions From Wine Storage Tanks**

## Wine and Brandy Storage Tank Emission Factors

### Breathing Loss Emission Factors

lb per day (or Year) per 1000 gallons nominal tank capacity

Nominal Tank Volume (gallons)	8 vol% Ethanol		10 vol% Ethanol		12 vol% Ethanol		14 vol% Ethanol		16 vol% Ethanol		18 vol% Ethanol		20 vol% Ethanol		100 vol% Ethanol	
	Daily	Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily	Annual	Daily	Annual
250	0.00186	0.347	0.00240	0.450	0.00296	0.557	0.00358	0.664	0.00421	0.787	0.00490	0.909	0.00561	1.04	0.02650	4.53
400	0.00186	0.347	0.00240	0.450	0.00296	0.556	0.00357	0.663	0.00421	0.786	0.00489	0.908	0.00561	1.04	0.02640	4.53
1,000	0.00185	0.346	0.00239	0.448	0.00295	0.554	0.00356	0.661	0.00419	0.783	0.00487	0.905	0.00558	1.04	0.02630	4.53
5,000	0.00181	0.340	0.00233	0.436	0.00288	0.539	0.00346	0.647	0.00408	0.762	0.00473	0.882	0.00541	1.01	0.02530	4.53
15,000	0.00178	0.335	0.00229	0.431	0.00283	0.532	0.00340	0.638	0.00401	0.751	0.00464	0.869	0.00531	0.993	0.02460	4.43
25,000	0.00178	0.335	0.00229	0.431	0.00282	0.531	0.00339	0.638	0.00399	0.750	0.00463	0.867	0.00529	0.991	0.02440	4.40
35,000	0.00176	0.332	0.00226	0.426	0.00279	0.526	0.00335	0.631	0.00395	0.742	0.00457	0.858	0.00523	0.980	0.02380	4.34
45,000	0.00175	0.331	0.00225	0.425	0.00278	0.524	0.00334	0.629	0.00393	0.739	0.00455	0.855	0.00471	0.976	0.02290	4.31
105,000	0.00172	0.326	0.00221	0.419	0.00272	0.516	0.00327	0.618	0.00384	0.726	0.00444	0.839	0.00507	0.957	0.02210	4.18
205,000	0.00169	0.321	0.00216	0.412	0.00267	0.507	0.00320	0.607	0.00375	0.712	0.00434	0.822	0.00495	0.938	0.02150	4.05
305,000	0.00166	0.317	0.00213	0.406	0.00262	0.500	0.00314	0.599	0.00369	0.702	0.00426	0.810	0.00486	0.923	0.02110	3.96
405,000	0.00165	0.315	0.00211	0.403	0.00259	0.495	0.00311	0.593	0.00364	0.695	0.00420	0.801	0.00479	0.913	0.02080	3.90
505,000	0.00163	0.313	0.00209	0.400	0.00257	0.492	0.00308	0.588	0.00361	0.689	0.00416	0.795	0.00474	0.905	0.02040	3.85
605,000	0.00162	0.310	0.00207	0.397	0.00254	0.488	0.00304	0.583	0.00357	0.683	0.00365	0.787	0.00468	0.896	0.02000	3.79

### Working Loss Emission Factors

lb per day (or year) per 1000 gallons tank throughput

Daily	0.158	0.200	0.244	0.289	0.335	0.383	0.432	1.630
Annual	0.109	0.138	0.170	0.198	0.230	0.263	0.297	1.130

## **BACT Attachment B**

### **Development of Direct Costs for Installation of a VOC Collection System on a Battery of Wine Storage Tanks**

## Background

During the development of District Rule 4694 (Wine Fermentation and Storage Tanks), The Wine Institute commissioned a study by Eichleay Engineers of California to develop costs for installation of VOC controls on all wine fermentation tanks at the Gallo winery located in Livingston, CA. The SJVAPCD participated in development of the study and in the review of the final draft. The District reviewed this estimate (Eichleay study) in conjunction with the development of District Rule 4694 (see Appendix C, Final Draft Staff Report - Rule 4694, December 15, 2005). The District's review indicated that, although the District took issue with various scope elements of the overall estimate, the estimating methodology employed appears to be fundamentally sound and follows accepted practice in the engineering and construction industry, accurately estimating the material quantities required for the stated scope and applying reasonable unit rates and costs for materials and labor for development of direct costs.

The Eichleay study developed detailed direct cost estimates for four separate tank batteries at Gallo-Livingston; VOC-1, '-2, '-3 and '-4 (see plot diagram in Attachment A). The direct cost estimate scope for each battery included a stainless steel ducting manifold system connected to a VOC control device and structural steel ducting supports with associated foundations. VOC-2 is a tank battery consisting of twelve (12) 200,000 gallon capacity tanks, identical to the hypothetical "industry-typical" tank battery installation which forms the basis for the cost effectiveness calculations for this BACT determination. The estimates of ducting, steel supports and foundations prepared in the Eichleay study for VOC-2 can be used as a basis to establish costs for the cost effectiveness evaluation required by this BACT determination.

## Approach and Estimate Basis

### Ducting

Attachment B is the detailed direct cost estimate from the Eichleay study for ducting for VOC-2 (annotated to indicate the required subtotals). Since VOC-2 at Gallo-Livingston consists of twelve fermentation tanks rather than storage tanks, the diameter of the estimated ductwork is larger than required for storage-only tanks due to the much larger vent rate from fermentation. However, since the tank sizes and layout considerations would not be affected by tank utilization, the Eichleay estimate of total linear footage and duct fittings ductwork can be utilized directly. The estimate details in Attachment B are utilized in the following manner to develop ducting costs for the "industry typical" tank battery:

- Linear feet of ductwork required is taken directly from the Eichleay estimate for VOC-2 (Attachment B). Linear feet required for individual branch connections to each tank is given by the footage of 12" diameter ducting while the linear footage for the main header is represented by the balance of the ductwork for VOC-2. Based on this approach, 75 linear feet of ducting is required for branch connections to the tanks while 870 feet of ducting is required for the main headers and the ducting run to the control device. Since the "industry-typical" ducting for storage tanks has been **determined to be 6" diameter for branch connections and 12" diameter for the main header**, the following material requirements are established for the "industry-typical" storage tank battery:

6" diameter ducting: 75 linear feet  
12" diameter ducting: 870 linear feet

- Unit direct cost (\$ per foot) of 12" diameter ducting can be determined by adding the labor and material costs required and dividing by the total linear footage of the particular diameter of ducting included in the estimate. For the 75 linear feet of 12" diameter ducting included in the Eichleay estimate for VOC-2, total labor and material costs were estimated at \$5,137 and \$5,650 respectively. Dividing each figure by 75 yields the unit labor and material costs for 12" diameter ducting:

Unit labor cost for 12" ducting: \$68.49/ft  
Unit material cost for 12" ducting: \$75.33/ft

- The Eichleay estimate did not include estimates of direct cost for 6" diameter duct. Therefore, it is necessary to develop a cost by appropriate factoring of the 12" diameter cost. To adjust the direct cost to a 6" system, cost equations for stainless steel plate ductwork are taken from the EPA Air Pollution Control Manual, Section 2, Chapter 1, Table 1.9, which indicates a cost equation for stainless steel plate duct as follows:

$$\text{Duct Cost} = 6.29 \times (\text{Duct Diameter}_{\text{inches}})^{1.23}$$

Using this equation form, it is apparent that the relative cost of 6" duct versus 12" duct can be calculated as follows:

$$6" \text{ Duct Cost} = 12" \text{ Duct Cost} \times (6/12)^{1.23}$$

Since the EPA cost manual develops total direct cost based on applying additional factors to the duct cost, the use of the above factor for adjustment of the total direct cost is consistent with EPA cost estimation methods.

Therefore,

$$\text{Unit Labor Cost for 6" Duct} = \$68.49 \times (6/12)^{1.23} = \$29.20/\text{linear foot}$$

$$\text{Unit Material Cost for 6" Duct} = \$75.33 \times (6/12)^{1.23} = \$32.11/\text{linear foot}$$

### Structural Steel

- Structural steel cost can be assumed to be the same for the "industry-typical" system as for VOC-2 since the heights and sizes of structure will be the same. Attachment C is the Eichleay estimate of structural steel required for VOC-2, annotated to show required subtotal. Based on this approach, structural steel cost for the industry-typical" case is as follows:

Purchased Structural Steel: \$287,630  
Labor for Erection of Structural Steel: \$45,273

## Foundations

- Cost for foundations for the structural steel towers can be assumed to be the same for the "industry-typical" system as for VOC-2 since the heights and sizes of the structures are assumed to be the same. Attachment D is the Eichleay estimate of the foundations required for VOC-2, annotated to show the required subtotal. Pricing is based on a subcontract price including labor and materials. Based on this approach, 32 drilled concrete piers are required at a subcontract cost of \$1,000 each.

## **BACT Attachment C**

### **Ducting, Structural Steel and Foundation Cost Estimates From Eichleay Study**



Client Name: Wine Institute

Job Number: 30913

Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.

Checked By: R.H.

Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/UNIT	TOTAL MHRS	UNIT COSTS			TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	
1	Bolt up	100	ea	6.5	650	65.00			422.50	42,250		42,250
1	Handle	96	ea	7.2	691.2	65.00			468.00	44,928		44,928
1	Install	20	lot	3	60	65.00			195.00	3,900		3,900
VOC-2												
2	12" Duct	75	ft					62.00	62.00	4,650		4,650
2	12" Duct misc. fittings	1	lot					1,000.00	1,000.00	1,000		1,000
2	Bolt up	21	ea	1.5	31.5	65.00			97.50	2,048		2,048
2	Handle	19	ea	2.08	39.52	65.00			136.20	2,569		2,569
2	Install	4	lot	2	8	65.00			30.00	520		520
2	18" Duct	65	ft					86.00	86.00	5,590		5,590
2	18" Duct misc. fittings	1	lot					2,000.00	2,000.00	2,000		2,000
2	Bolt up	19	ea	3	57	65.00			195.00	3,705		3,705
2	Handle	17	ea	3.52	59.84	65.00			228.80	3,890		3,890
2	Install	3	lot	2	6	65.00			130.00	390		390
2	22" Duct	50	ft					99.00	99.00	4,950		4,950
2	22" Duct misc. fittings	1	lot					2,000.00	2,000.00	2,000		2,000
2	Bolt up	15	ea	4	60	65.00			260.00	3,900		3,900
2	Handle	13	ea	4.6	59.8	65.00			299.00	3,887		3,887
2	Install	3	lot	3	9	65.00			195.00	585		585
2	24" Duct	35	ft					106.00	106.00	3,710		3,710
2	24" Duct misc. fittings	1	lot					3,000.00	3,000.00	3,000		3,000
2	Bolt up	11	ea	4	44	65.00			260.00	2,860		2,860
2	Handle	9	ea	4.6	41.4	65.00			299.00	2,691		2,691
2	Install	2	lot	3	6	65.00			195.00	390		390
2	28" Duct	15	ft					119.00	119.00	1,785		1,785
2	28" Duct misc. fittings	1	lot					2,000.00	2,000.00	2,000		2,000
2	Bolt up	5	ea	5.5	27.5	65.00			357.50	1,788		1,788
2	Handle	4	ea	5.32	21.28	65.00			345.80	1,383		1,383

*Total Ducting > 12" dia = 870'*

*Handwritten notes:*  
Labor & Mat'l cost for 75' of 12" duct = 5,650  
5,137



**Eichle**  
Engineers Inc. of CA

Client Name: Wine Institute

Job Number: 30913

Job Title: Fermenter VOC Emisalons - Livingston West Side Fermenters

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.

Checked By: R.H.

Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHR	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
2	Install	1	lot	3	3	65.00			195.00	195			195
2	30" Duct	25	ft				128.00		128.00		3,200		3,200
2	30" Duct misc. fittings	1	lot				2,000.00		2,000.00		2,000		2,000
2	Bolt up	8	ea	5.5	44	65.00			357.50	2,860			2,860
2	Handle	6	ea	5.32	31.92	65.00			345.80	2,075			2,075
2	Install	1	lot	3	3	65.00			195.00	195			195
2	32" Duct	265	ft				177.00		177.00		46,905		46,905
2	32" Duct misc. fittings	1	lot				4,500.00		4,500.00		4,500		4,500
2	Bolt up	68	ea	6	408	65.00			390.00	26,520			26,520
2	Handle	66	ea	6	396	65.00			390.00	25,740			25,740
2	Install	13	lot	3	39	65.00			195.00	2,535			2,535
2	42" Duct	415	ft				242.00		242.00		100,430		100,430
2	42" Duct misc. fittings	1	lot				25,000.00		25,000.00		25,000		25,000
2	Bolt up	115	ea	6.5	747.5	65.00			422.50	48,588			48,588
2	Handle	104	ea	7.12	740.48	65.00			462.80	48,131			48,131
2	Install	21	lot	4	84	65.00			260.00	5,460			5,460
VOC-3													
3	6" Duct	25	ft				38.00		38.00		950		950
3	6" Duct misc. fittings	1	lot				500.00		500.00		500		500
3	Bolt up	7	ea	1	7	65.00			65.00	455			455
3	Handle	6	ea	1.4	8.4	65.00			91.00	546			546
3	Install	1	lot	1.5	1.5	65.00			97.50	98			98
3	10" Duct	35	ft				54.00		54.00		1,890		1,890
3	10" Duct misc. fittings	1	lot				1,000.00		1,000.00		1,000		1,000
3	Bolt up	11	ea	1.5	16.5	65.00			97.50	1,073			1,073
3	Handle	9	ea	1.72	15.48	65.00			111.80	1,006			1,006
3	Install	2	lot	2	4	65.00			130.00	260			260
3	12" Duct	70	ft				62.00		62.00		4,340		4,340

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Client Name: Wine Institute

Job Number: 30913

Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.

Checked By: R.H.

Rev. 2 Date: 6/24/05

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHRS	UNIT COSTS			TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	
VOC-2 Duct Section												
2	15 x 15 towers	4	ea	20	80	65.00	20,000.00		21,300.00	5,200	80,000	85,200
2	20' top level connection beams	6	ea	2	12	65.00	700.00		830.00	780	4,200	4,980
2	cross bracing on top open sections	3	ea	2	6	65.00	400.00		530.00	390	1,200	1,590
2	15 x 15 towers	3	ea	20	60	65.00	20,000.00		21,300.00	3,900	60,000	63,900
2	15' top level connection beams	4	ea	2	8	65.00	550.00		680.00	520	2,200	2,720
2	cross bracing on top open sections	2	ea	2	4	65.00	300.00		430.00	260	600	860
2	15 x 20 towers - shared vertical colums	2	ea	20	40	65.00	20,000.00		21,300.00	2,600	40,000	42,600
2	15 x 15 tower	1	ea	20	20	65.00	10,000.00		11,300.00	1,300	10,000	11,300
2	3' wide grating on walkway 3, 4' wide on walkway 4	945	sf	0.15	141.75	65.00	19.00		28.75	9,214	17,955	27,169
2	3' wide grating to tanks	360	sf	0.15	54	65.00	19.00		28.75	3,510	6,840	10,350
2	handrails	820	lf	0.3	246	65.00	75.00		94.50	15,990	61,500	77,490
2	grating to existing catwalks	165	sf	0.15	24.75	65.00	19.00		28.75	1,609	3,135	4,744
<div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;"> <b>Structural Steel</b> </div>												
<div style="border: 1px solid black; border-radius: 50%; padding: 5px; display: inline-block;"> <b>45,273 287,630</b> </div>												
VOC-3 Duct Section												
3	20 x 8 towers	3	ea	20	60	65.00	15,000.00		16,300.00	3,900	45,000	48,900
3	20' top level connection beams	6	ea	2	12	65.00	700.00		830.00	780	4,200	4,980
3	cross bracing on top open sections	3	ea	2	6	65.00	400.00		530.00	390	1,200	1,590
3	15 x 8 towers	1	ea	20	20	65.00	14,000.00		15,300.00	1,300	14,000	15,300
3	15 x 15 towers	5	ea	20	100	65.00	18,000.00		19,300.00	6,500	90,000	96,500
3	15' top level connection beams	8	ea	2	16	65.00	550.00		680.00	1,040	4,400	5,440
3	cross bracing on top open sections	4	ea	2	8	65.00	300.00		430.00	520	1,200	1,720
3	3' wide grating on walkway 6 & 7	810	sf	0.15	121.5	65.00	19.00		28.75	7,898	15,390	23,288
3	3' wide grating to tanks	510	sf	0.15	76.5	65.00	19.00		28.75	4,973	9,690	14,663
3	handrails	920	lf	0.3	276	65.00	75.00		94.50	17,940	69,000	86,940
3	grating to existing catwalks	60	sf	0.15	9	65.00	19.00		28.75	585	1,140	1,725



**Eichler**  
Engineers Inc. of CA

Client Name: Wine Institute  
Job Number: 30913  
Job Title: Fermenter VOC Emissions - Livingston West Side Fermenters

**PRELIMINARY ESTIMATE**

Estimated By: P.H.M.  
Checked By: R.H.  
Rev. 2 Date: 6/24/05

O:\30913\5.0 Design Documents\Estimates\Rev. 2\Living

CODE	ITEM DESCRIPTION	QUANT	UNIT	MHR/ UNIT	TOTAL MHR	UNIT COSTS				TOTAL COSTS			TOTAL
						\$ / Hr	MAT'L	SUBCON.	TOTAL	LABOR	MAT'L	SUBCON.	
	<b>030 - Concrete</b>												
	VOC -1 Duct sections												
1	Install drilled piers (20) rack #1	20	ea					1,000.00	1,000.00			20,000	20,000
1	Install drilled piers (20) rack #2	20	ea					1,000.00	1,000.00			20,000	20,000
1	Install drilled piers (42) for main rack inside plant	42	ea					1,500.00	1,500.00			63,000	63,000
1	Install drilled piers (46) for main rack outside plant	46	ea					700.00	700.00			32,200	32,200
1	Install drilled piers (32) for main rack by VOC's	32	ea					700.00	700.00			22,400	22,400
1	Install foundation for VOC-1 & tank	110	cy					450.00	450.00			49,500	49,500
	VOC -2 Duct sections												
2	Install drilled piers (16) rack #3	16	ea					1,000.00	1,000.00			16,000	16,000
2	Install drilled piers (18) rack #4	16	ea					1,000.00	1,000.00			16,000	16,000
2	Install foundation for VOC-1 & tank	110	cy					450.00	450.00			49,500	49,500
	VOC -3 Duct sections												
3	Install drilled piers (16) rack #6	16	ea					1,000.00	1,000.00			16,000	16,000
3	Install drilled piers (20) rack #7	20	ea					1,000.00	1,000.00			20,000	20,000
3	Install foundation for VOC-1 & tank	110	cy					450.00	450.00			49,500	49,500
	VOC -4 Duct sections												
4	Install drilled piers (0) rack #4		ea					1,000.00	1,000.00				
4	Install drilled piers (20) rack #5	20	ea					1,000.00	1,000.00			20,000	20,000
4	Install foundation for VOC-1 & tank	110	cy					450.00	450.00			49,500	49,500
	Allowance for building pad	3	cy					450.00	450.00			1,350	1,350
	<b>TOTAL - Concrete</b>											444,950	444,950

*Drilled Piers*