

## **Appendix D**

### **Dewatering Cost Estimate**

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**Pinellas Site: Bryan Dairy Road Construction Dewatering**

Preliminary Layout Cost Estimate			Dewatering Near Side and Far Side of Streets			
No.	Item	Qty.	Unit	Unit Cost	Cost	Cost Basis
1	6" Header w/Well Points					
3	Bryan Dairy - North- No.1 A&B	200	LF	\$5.25	\$1,050.00	Croy Dewatering
2	Bryan Dairy - North-No. 2	100	LF	\$5.25	\$525.00	Croy Dewatering
2	Bryan Dairy - North-No. 3	520	LF	\$5.25	\$2,730.00	Croy Dewatering
4	Bryan Dairy - South No. 4	660	LF	\$5.25	\$3,465.00	Croy Dewatering
6	Belcher - West- No. 5	180	LF	\$5.25	\$945.00	Croy Dewatering
5	Belcher - West- No. 6	440	LF	\$5.25	\$2,310.00	Croy Dewatering
8	Belcher - East No. 7	50	LF	\$5.25	\$263.00	Croy Dewatering
7	Belcher - East No. 8	440	LF	\$5.25	\$2,310.00	Croy Dewatering
9	Bryan Dairy/Belcher NW Pole	60	LF	\$10.50	\$630.00	Croy Dewatering (increase for deeper wells)
10	Bryan Dairy/Belcher SE Pole	60	LF	\$10.50	\$630.00	Croy Dewatering (increase for deeper wells)
11	Bryan Dairy/Belcher NE Pole	60	LF	\$10.50	\$630.00	Croy Dewatering (increase for deeper wells)
12	Subtotal:				\$15,488.00	\$19,359.00 (with 25% contingency)
13	Horizontal Street Borings					
14	Bryan Dairy Boring Pits	2	Each	\$3,000.00	\$6,000.00	Eng. Est.
15	Bryan Dairy Pits Preparation	2	Each	\$3,600.00	\$7,200.00	Means
16	Bryan Dairy Boring - 3"	160	LF	\$50.00	\$8,000.00	Means
17	1.5" Transfer Pipe, dbl. cont.	200	LF	\$12.00	\$2,400.00	4.5 Acre Hist. Costs, Factored to '08
18	Valving and connections	2	Each	\$3,000.00	\$6,000.00	Eng. Est.
19	Belcher Boring Pits	2	Each	\$3,000.00	\$6,000.00	Eng. Est.
20	Belcher Pits Preparation	2	Each	\$3,600.00	\$7,200.00	Means
21	Belcher Boring - 3"	180	LF	\$30.00	\$5,400.00	Means
22	1.5" Transfer Pipe	220	LF	\$12.00	\$2,640.00	4.5 Acre Hist. Costs, Factored to '08
23	Valving and connections	2	Each	\$3,000.00	\$6,000.00	Eng. Est.
24	Subtotal:				\$56,840.00	\$71,050.00 (with 25% contingency)
25	WWNA Transfer Line					

Pinellas Site: Bryan Dairy Road Construction Dewatering						
Preliminary Layout Cost Estimate			Dewatering Near Side and Far Side of Streets			
No.	Item	Qty.	Unit	Unit Cost	Cost	Cost Basis
26	2" PVC Dbl Cont. Water Line	2520	LF	\$15.00	\$37,800.00	4.5 Acre Hist. Costs, Factored to '08
27	90 deg. Bend	7	Each	\$88.00	\$616.00	4.5 Acre Hist. Costs, Factored to '08
28	45 deg. Bend	4	Each	\$88.00	\$352.00	4.5 Acre Hist. Costs, Factored to '08
29	Tee	7	Each	\$292.00	\$2,044.00	4.5 Acre Hist. Costs, Factored to '08
	Ball valves	3	Each	\$639.00	\$1,917.00	
30	Trench Excavation - 2' x 3' deep	560	CY	\$8.00	\$4,480.00	Means
31	Trench Backfill	560	Cy	\$5.00	\$2,800.00	Means
33	Non-destructive pipe testing	1	Each	\$1,300.00	\$1,300.00	4.5 Acre Hist. Costs, Factored to '08
34	Auto-air Vent	3	Each	\$340.00	\$1,020.00	4.5 Acre Hist. Costs, Factored to '08
35	Street crossings-asphalt patch	2	Each	\$2,000.00	\$4,000.00	Eng. Est.
36	Misc. Connections	1	LS	\$3,000.00	\$3,000.00	Eng. Est.
37	Subtotal:				\$59,329.00	\$74,161 (with 25% contingency)
38	Project Subtotal				\$131,656.50	
39	Contingency @25%				\$32,914.13	
	<b>Project Total Cost Estimate</b>				<b>\$164,570.63</b>	

**Pinellas Site - Bryan Dairy Road Construction Dewatering**

**Dewatering Near Side and Far Sides of Streets Individual Well Flow Analysis**

Quantity Takeoff	16-May-08	Well Spacing: 5 ft on center				Possible Flow Combinations		Total Flow	Groundwater Pumping Rates and Cumulative			
		Header Length	Well Depths	No. of Wells	Individual Well Flow	Header Total Flow (gpm)	Combinations	Flow	33% Safety	Days of Pumping	Gallons per Day	Total Gallons
Bryan Dairy - North-No. 1, A&B		200	10.5	44	0.28	12	1	34	45	47	64,581	3,035,286
Bryan Dairy - North-No.2		100	10.5	20	0.125	3	1					
Bryan Dairy - North-No.3		520	7	105	0.18	19	1					
Bryan Dairy - South No. 4		660	10	145	0.14	20	2	20	27	47	38,879	1,827,292
Belcher - West-No. 5		180	9.5	37	0.14	5	3	19	25	32	35,489	1,135,637
Belcher - West-No. 6		440	7	89	0.15	13	3					
Belcher - East-No. 7		50	10	11	0.175	2	4	12	16	27	22,437	605,787
Belcher - East-No.8		440	5.5	89	0.11	10	4					
Bryan Dairy/Belcher NW Pole No. 9		60	23	13	0.33	4	5	4	6	5	8,216	41,081
Bryan Dairy/Belcher NE Pole No. 10		60	23	13	0.33	4	6	4	6	5	8,216	41,081
Bryan Dairy/Belcher SW Pole No. 11		60	23	13	0.33	4	7	4	6	5	8,216	41,081
Total:		2,770		579							Total:	3,691,960

**Pipe Size Analysis**

Pipe Size-Class 200 (inch):	GPM @ 5 fps				SUMMARY
1.5	38				1. Group meeting 5/16/07: Use gpm per well values presented in Section 4.0 per well.
2	56				2. Apply safety factor of 33%
2.5	84				3. Combination No. 1, Bryan Dairy North side headers produces probable max. of 45 gpm.
3	120				4. Based on potential flow of 45 gpm: Use 2" diameter PVC pipe for transmission line.
4	200				5. Using 2" diameter pipe provides 65% safety factor.
6	370				6. Based on potential flow of 16 - 27 gpm from Belcher East side & Bryan Dairy South:
8	750				Use 1.5 inch pipe for street crossings.

**Pinellas Site - Bryan Dairy Road Construction Dewatering**

**Dewatering Near Side and Far Sides of Streets Individual Well Flow Analysis**

**Frac Tank Analysis**

<b>Tank Size</b>	<b>GPM</b>	<b>Hours to Fill</b>					
21,000	10	35.0		<b>Frac Tank Requirements (based on 45 gpm)</b>			
21,000	20	17.5					
21,000	30	11.7		<b>Off-Site Lab: 3-day turnaround; use 4 days for assurance</b>			
21,000	40	8.8		<b>Days Storage</b>	<b>Gals. Stored</b>	<b>Tanks Req.</b>	<b>Two Sets Req.</b>
21,000	50	7.0		4	258,322	12	25
21,000	60	5.8		<b>On-Site Lab: 1-day turnaround</b>			
21,000	70	5.0		<b>Days Storage</b>	<b>Gals. Stored</b>	<b>Tanks Req.</b>	<b>Two Sets Req.</b>
21,000	80	4.4		1	64,581	3	6
21,000	90	3.9		<b>Air Stripper Requirements</b>			
21,000	100	3.5		<b>Lab Samples</b>			
				Daily	5		
				Weekly	4		
				Monthly	5		
				Total	14		

Pinellas Site: Bryan Dairy Road Construction Dewatering						
Preliminary Operations Cost Estimate — Dewatering Near Side and Far Sides of Streets						
No.	Item	Qty.	Unit	Unit Cost	Cost	Cost Basis
1	<u>Bryan Dairy Road North</u>					
2	Pump rental-Headers No.1&2A&B	47	Days	\$190.00	\$8,930	Croy Dewatering (1 pump @\$95/ day, need 2 for 2 headers)
3	Diesel usage- 2 pumps	2256	Gals	\$4.50	\$10,152	Croy Dewatering (1 gal. diesel per hour usage/pump)
4	Operations labor	752	Hours	\$65.00	\$48,880	Manpower support costs
	Subtotal:				\$67,962	\$84,953 (with 25% contingency)
5	<u>Bryan Dairy Road South</u>					
6	Pump rental-Header No. 3	47	Days	\$95.00	\$4,465	Croy Dewatering
7	Diesel usage	1128	Gals	\$4.50	\$5,076	Croy Dewatering (1 gal. diesel per hour usage/pump)
8	Operations labor	752	Hours	\$65.00	\$48,880	Manpower support costs
	Subtotal:				\$58,421	\$73,026 (with 25% contingency)
9	<u>Belcher Road West</u>					
10	Pump rental-Header No. 6&7	32	Days	\$190.00	\$6,080	Croy Dewatering (1 pump @\$95/ day, need 2 for 2 headers)
11	Diesel usage-2 pumps	1536	Gals	\$4.50	\$6,912	Croy Dewatering (1 gal. diesel per hour usage/pump)
12	Operations labor	512	Hours	\$65.00	\$33,280	Manpower support costs
	Subtotal:				\$46,272	\$57,840 (with 25% contingency)
13	<u>Belcher Road East</u>					
14	Pump rental-Headers No. 8&9	27	Days	\$190.00	\$5,130	Croy Dewatering (1 pump @\$95/ day, need 2 for 2 headers)
15	Diesel usage	648	Gals	\$4.50	\$2,916	Croy Dewatering (1 gal. diesel per hour usage/pump)
16	Operations labor	432	Hours	\$65.00	\$28,080	Manpower support costs
	Subtotal:				\$36,126	\$45,158 (with 25% contingency)
17	<u>Transfer Pump Station</u>					
18	Transfer Pump/Tank rental	22	weeks	\$250.00	\$5,464	Croy Dewatering
19	Diesel usage	3672	Gals	\$4.50	\$16,524	Croy Dewatering (1 gal. diesel per hour usage/pump)
	Subtotal:				\$21,988	\$27,485 (with 25% contingency)
20	Total:				\$230,769	
30	Contingency @ 25%:				\$57,692	
	<b>Operations Subtotal:</b>				<b>\$288,462</b>	

Pinellas Site: Bryan Dairy Road Construction Dewatering						
Preliminary Operations Cost Estimate — Dewatering Near Side and Far Sides of Streets						
Water Management Options						
Option No. 1: Frac Tanks Used to Manage Water – Off-site Lab Sample With 4-Day Turnaround						
No.	Item	Qty.	Unit	Unit Cost	Cost	Cost Basis
1	Frac Tank Rentals - 25 each	153	Days	\$2,043.43	\$312,645	Baker Tanks: 21K tank each @\$50/day
2	Tank Mob./Demob.	50	Each	\$180.00	\$9,000	Baker Tanks: cost per tank, each way
3	Vacuum sediments from tanks	25	Each	\$1,000.00	\$25,000	Baker Tanks: estimate on vacuum trucks
4	80 gpm electric pump	2	Each	\$5,000.00	\$10,000	Eng. Est.: purchase/install pump to empty Frac tanks.
5	Subtotal:				\$356,645	
6	Lab Analysis	51	Each	\$200.00	\$10,200	J. Daniel, quick turnaround; samples every 3 days
7	WWNA Disposal Charge	3,692	1,000 gals	\$4.90	\$18,091	J. Daniel
8	Subtotal:				\$28,291	
	Total:				\$384,935	
	Contingency @ 25%:				\$96,234	
	<b>Frac Tank Option Total Cost:</b>				<b>\$481,169</b>	
Option No. 2: Installing Air Stripper - Offsite Lab Sample to Establish Compliance						
No.	Item	Qty.	Unit	Unit Cost	Cost	Cost Basis
1	Air Stripper unit	1	each	\$38,000	\$38,000	QED w/8% tax
	Air Stripper unit installation	1	each	\$5,000	\$5,000	Engineers estimate
2	Concrete containment pad	1	each	\$15,000	\$15,000	4.5 Acre Site 2003 installation estimate
3	Air Stripper pad piping	1	each	\$6,000	\$6,000	4.5 Acre Site 2003 installation estimate
4	Air Stripper pad electric wiring	1	each	\$8,000	\$8,000	Engineers estimate
5	Subtotal:				\$72,000	\$90,000 (with 25% contingency)
6	Lab Analysis	14	each	\$200	\$2,800	J. Daniel, quick turnaround
7	WWNA Disposal Charge	3,692	1,000 gals	\$4.90	\$18,091	J. Daniel
	Subtotal:				\$20,891	\$26,113 (with 25% contingency)
	Total:				\$92,891	
	Contingency @ 25%:				\$23,223	
	<b>Air Stripper Option Total Cost:</b>				<b>\$116,113</b>	

**Pinellas Site: Bryan Dairy Road Construction Dewatering**

**Preliminary Operations Cost Estimate — Dewatering Near Side and Far Sides of Streets**

**Assumptions:**

1. Areas presented Bryan Dairy North, Bryan Dairy South, Belcher West, and Belcher East will each be dewatered sequentially.
2. Dewatering system will need to be continuously operated 24/7 during construction in each area.
3. Durations presented for each area are estimated and include 7 days pre-construction dewatering requirement
4. Operator required 16 hours per day for 7 days per week during operations to assure pump running, transfer pump running, operate or check on discharge system (tanks or air stripper). Operators to stagger 2-4 hours before and after work shift.
5. Total construction duration for all four areas: 22 weeks.
6. Light poles will be done during street work and is included with street area durations.
7. Air Stripper Option: lab samples required daily for 5 days upon start up, weekly for 1-month, monthly thereafter.
8. Water will be discharged into STAR Center WWNA discharge point. For budgeting use \$4.90/ 1,000 gals. discharged.