

Appendix E						
Healy #1 Dry FGD						
Given/Assumed						
Flow rate (acfm)	150,000	Company report				
Flue Gas Temperature (degrees F)	320	calculated from Company report				
Uncontrolled emissions (TPY)	887	Company report				
Total Installed Capital Cost	\$8,357,143	Company report				
Retrofit factor	1.0	assumed				
Acid Gas Control efficiency	90%	assumed				
Site Preparation		assumed				
Buildings		assumed				
Control System Pressure Drop In. wc)	8.55	OAQPS Control Cost Manual				
Pump flow rate (gpm)	272	Company report				
Pump pressure (ft)	60	OAQPS Control Cost Manual				
Operating Hours per Year	8,760	Company report				
Operating Hours per Shift	8	assumed				
Operating Shifts per Year	1095	calculated				
Operating Labor Cost (\$/hr)	\$ 15.64	OAQPS Control Cost Manual				
Maintenance Labor Cost (\$/hr)	\$ 17.21	OAQPS Control Cost Manual				
Waste generation (lb/hr)	567	scaled up from Company report	472	Company report		
Waste disposal cost (\$/ton)	\$ 15.00	Company report				
Solvent usage (gpm)	20	scaled up from Company report	17	Company report		
Solvent cost (\$/kgal)	\$ 1.22	Company report				
Chemical usage (lb/hr)	331	scaled up from Company report	276	Company report		
Chemical cost (\$/ton)	\$ 91.25	Company report				
Electrical Cost (\$/kWh)	\$ 0.05	Company report				
Fan-Motor Efficiency (%)	70%	OAQPS Control Cost Manual				
Pump-Motor Efficiency (%)	70%	OAQPS Control Cost Manual				
Equipment Life (yr)	15	OAQPS Control Cost Manual				
Interest Rate (%)	7%	OAQPS Control Cost Manual				

Healy #1 Dry FGD

Capital Cost factors for Gas Absorbers--OAQPS Control Cost Manual, Chap 9

Cost Item	Factor	Cost
Direct Costs		
Purchased equipment costs		
Absorber + auxiliary equipment, EC	A	
Instrumentation	0.10 A	\$0
Sales taxes	0.03 A	\$0
Freight	0.05 A	\$0
Purchased equipment cost, PEC	B= 1.18 A	\$0
Direct installation costs		
Foundations & supports	0.12 B	\$0
Handling & erection	0.40 B	\$0
Electrical	0.01 B	\$0
Piping	0.30 B	\$0
Insulation	0.01 B	\$0
Painting	0.01 B	\$0
Direct installation costs x	1 x 0.85 B	\$0
Site preparation	As required, SP	\$0
Buildings	As required, Bldg.	\$0
Total Direct Costs, DC	1.85 B+SP+Bldg	\$0
Indirect Costs (installation)		
Engineering	0.10 B	\$0
Construction and field expenses	0.10 B	\$0
Contractor fees	0.10 B	\$0
Start-up	0.01 B	\$0
Performance test	0.01 B	\$0
Contingencies	0.03 B	\$0
Total Indirect Costs, IC	0.35 B	\$0
Total Capital Investment = DC + IC	2.20 B+SP+Bldg	\$8,357,143

Healy #1 Dry FGD							
Annual Cost factors for Gas Absorbers--OAQPS Control Cost Manual, Chap 5							
Cost Item	Factor					Cost	
Direct Annual Costs, DC							
Operating labor							
Operator				0.5 hr/shift		\$8,563	
Supervisor				15% of operator		\$1,284	
Operating materials							
Solvent	20.408	gpm *		\$ 1.22	/kgal =	\$13,086	
Chemicals	331.32	lb/hr *		\$ 91.25	/ton =	\$132,422	
Wastewater Disposal	20.408	gal/min *		60	min/hr *		
	8760	hr/yr *		\$ 15.00	/kgal =	\$160,894	
Maintenance							
Labor				0.5 hr/shift		\$9,422	
Material				100.00% of maintenance		\$9,422	
Electricity	All electricity equal to:						
fan	0.000117 *		150000	acfm*	8.55 in.wc*		
	8760	hr/yr *		0.05	unit cost =	\$93,890	
pump	0.746	kW/HP*	0.000252 *		272 gpm *		
	60	ft.wc*	8760	hr/yr *	0.05	unit cost =	\$ 1,920
	Total DC					\$430,904	
Indirect Annual Costs, IC							
Overhead	60% of total labor and material costs					\$17,215	
Administrative charges	2% of Total Capital Investment					\$167,143	
Property tax	1% of Total Capital Investment					\$83,571	
Insurance	1% of Total Capital Investment					\$83,571	
Capital recovery	0.1098 * Total Capital Investment					\$917,569	
	Total IC					\$1,269,070	
Total Annual Cost					DC + IC	\$1,699,975	

	Healy #1 Dry FGD				
		SO2			
	Uncontrolled emissions (TPY)	887			
	Control efficiency (%)	90%	75%	Company report	
	Emission reduction (TPY)	798	665	Company report	
	Controlled emissions (TPY)	89	222	Company report	
	Total annualized cost (\$/yr)	\$1,699,975	1,600,000	Company report	
	Cost/ton removed (\$/T)	\$2,129	\$ 1,494	Company report	

Operating company	Golden Valley			
Facility	Healy			
State	AK			
Contact				
Proposed Controls	rejected new LSD		rejected new LSD	
Unit	#1		#1	
Boiler Type	wall-fired		ADEC report	wall-fired ADEC report
Fuel	sub-bituminous		ADEC report	sub-bituminous ADEC report
Rating (MW Gross) each	25		ADEC report	25 ADEC report
Presumptive BART limit (lb/mmBtu) or	0.15		BART Guidelines	0.15 BART Guidelines
Presumptive BART limit	95%		BART Guidelines	95% BART Guidelines
Rating (mmBtu/hr)	338		company report	338 company report
Current Uncontrolled Emissions (lb/mmBtu)	0.60		company report	0.60 company report
Current Uncontrolled Emissions (tpy)	887		company report	887 company report
Current Emissions (lb/mmBtu)	0.30		company report	0.30 company report
CDPHE Cost-benefit Analysis				
Overall Control Efficiency (FGD)	75.0%		company report	90% NPS estimate
Controlled Emissions (lb/mmBtu)	0.15		company report	0.06 calculated
Controlled emissions (tpy)	222		company report	89 calculated
Emission Reductions (tpy)	665		company report	798 calculated
Capital Cost	\$	8,357,143	company report	\$ 8,357,143 company report
Capital Cost (\$/kW)	\$	334	calculated	\$ 334 calculated
O&M Cost	\$	631,511	company report	\$ 430,904 calculated with OAQPS Control Cost Manual
Annualized Cost	\$	1,607,872	company report	\$1,699,975 calculated with OAQPS Control Cost Manual
Cost-Effectiveness (\$/ton)	\$	2,417	calculated	\$ 2,129 calculated
Proposed BART Limits				
Proposed BART Limit (company)	none			
Proposed BART Limit (state)	0.30 lb/mmBtu			
Effective Reduction from Current	0%		calculated	
Effective BART Limit (tpy)	444		calculated	
Visibility analyses				
Visibility Improvement (dv at Max Class I)	(0.052)		company report	
Cost-Effectiveness (\$/98th % dv at Max Class I)	\$	(32,691,821)	company report	
Pollutant Control Effectiveness (dv/ton)	(0.00008)		calculated from company report	
Visibility Improvement (dv at Summed Class I)			not provided	
Cost-Effectiveness (\$/98th % dv at Summed Class I)			not provided	
Pollutant Control Effectiveness (dv/ton)			not provided	