Attachment 1

Mass Balance Diagrams for

Sooner Station and Muskogee Station

This page inserted by Oklahoma Department of Environmental Quality.

Comments

of

Oklahoma Gas and Electric Company

on

Regional Haze Implementation Plan Revision

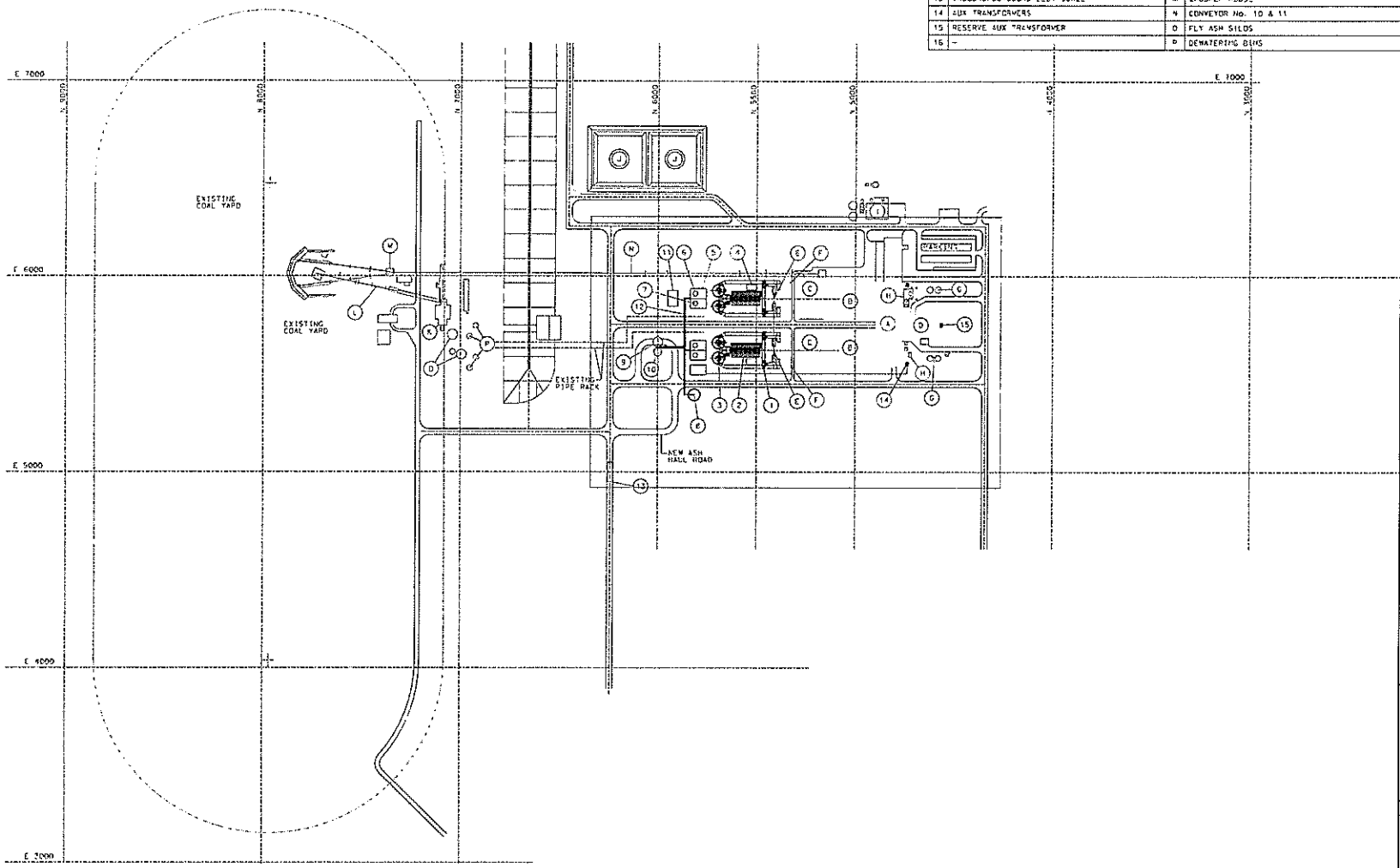
Attachment 1 of Exhibit 3 of the comments submitted by OG&E on December 16, 2009 includes 4 pages that have been identified as confidential information. These pages include mass balance diagrams for Sooner Station and Muskogee Station and have been removed as provided by 27A O.S. § 2-5-105(17).

Attachment 2

Sooner Station

General Arrangement Drawing

LEGEND NEW EQUIPMENT		LEGEND EXISTING EQUIPMENT	
01	BOOSTER FANS	A	TURBINE BUILDING
02	FABRIC FILTER	B	BOILER BUILDING
03	SPRAY DRYER ABSORBER	C	PRECIPITATOR
04	ASH BLOWER BUILDINGS	D	CONTROL ROOM
05	RECYCLE/LIME PREP. BUILDING	E	STACK
06	RECYCLE SILOS	F	ID FANS
07	LIME DAY BINS	G	CONDENSATE STORAGE TANKS
08	LIME STORAGE SILO	H	MAIN TRANSFORMER
09	WASTE ASH SILO	I	WATER TREATMENT BUILDING
10	FLY ASH SILO	J	LIGHT OIL STRAGE TANKS
11	ELECTRICAL EQUIPMENT ROOM	K	CAR DUMPER
12	PIPE RACK	L	CONVEYOR No.2
13	INBOUND/OUTBOUND BELT SCALE	M	CRUSHER HOUSE
14	AUX TRANSFORMERS	N	CONVEYOR No. 10 & 11
15	RESERVE AUX TRANSFORMER	O	FLY ASH SILOS
16	-	P	DEWATERING BINS



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A	11/20/2009	FOR CLIENT COMMENTS

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OGE

PROJECT

SOONER GENERATING STATION

UNITS 1 & 2
OKLAHOMA GAS & ELECTRIC
RED ROCK, OKLAHOMA

DRAWING TITLE

PRELIMINARY
GENERAL ARRANGEMENT

DRAWING NUMBER	REVISION
SK-GA-SNR-01	A

SHEET 1 OF 1

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2L5225/CH2020/0:\SOONER STATION\NEW OPTION - 2009\SK-GA-SNR-01-A.DGN
Form EDC-0401-01-08, ANSI (Imperial) Microstation Border - Size E - 34 x 44
Revision 9: Revision Date: 12-19-2008

Attachment 3

Sooner Station

Power Requirement Tables

Summary of DFGD/BAGHOUSE Power Consumption
Sooner Unit 1 or 2

Inputs:	Capacity	Heat Input	SDA Inlet Flow*	SDA Outlet Flow*	Booster Fan Inlet Flow*	Max. Sulfur in Coal	HHV	Inlet SO_2	Max. Lime*
	MWg	mmBtu/hr	acfm	acfm	acfm	%	Btu/lb	lb/mmBtu	lb/hr
Sooner Unit 1 or 2	570	5,116	1,910,947	1,724,051	1,764,944	0.48	8,084	1.176	8,908

*From S&L mass balance

	Connected	Operating	Load per Motor HP	Load per Motor kW	CONNECTED HP	CONNECTED kW	OPERATING HP	OPERATING kW	Operating Usage
Absorber Island									
Atomizers	2	2	960	716	1920	1432	1920	1432	
Penthouse Heaters	2	2		50		100		100	(winter)
Dampers	2	2	5	4	10	7	10	0.1	2% time
Miscellaneous	0.5 to 10 HP motors		30	22	30	22	3	2	10% time
Total						**1562**		**1535**	

	Connected	Operating	Load per Motor HP	Load per Motor kW	CONNECTED HP	CONNECTED kW	OPERATING HP	OPERATING kW	Operating Usage
Reagent Preparation and Recycle Island									
Lime Unloading Blowe	2	1	300	224	600	448	30	22	10% time
Silo Live Bottom	2	1	7	5	14	10	7	5	
Lime Feeder	2	1	5	4	10	7	5	4	
Ball Mill Slaker	2	1	110	82	220	164	110	82	
Slurry Tank Agitator	2	1	40	30	80	60	40	30	
Slurry Feed Pump	2	1	20	15	40	30	20	15	
Recycle Silo Fluidization Air Blowe	2	1	20	15	40	30	20	15	
Recycle Silo Fluidization Air Heate	2	1		40		80		40	
Recycle Slurry Mixer	2	1	150	112	300	224	150	112	
Recycle Feed Pump	2	1	40	30	80	60	40	30	
Miscellaneous	0.5 to 10 HP motors		20	15	20	15	10	7	50% time
Total						**1127**		**362**	

Summary of DFGD/BAGHOUSE Power Consumption
Sooner Unit 1 or 2

	Connected	Operating	Load per Motor HP	Load per Motor kW	CONNECTED HP	CONNECTED kW	OPERATING HP	OPERATING kW	Operating Usage
Baghouse/Ash Handling Islanc									
Compressor	2	1	500	373	1000	746	250	187	50% time
Hopper Heater	16	16		260		260		130	50% time
Penthouse Heaters / Hopper Enclosure Heaters	12	12		240		240		120	50% time
Transport Air Vac. Blowers	2	1	150	112	300	224	150	112	
Miscellaneous	0.5 to 10 HP motors		50	37	50	37	10	7	20% time
Total						**1507**		**556**	

	Connected	Operating	Load per Motor HP	Load per Motor kW	CONNECTED HP	CONNECTED kW	OPERATING HP	OPERATING kW	Operating Usage
Booster Fan System w FGD									
Booster Fan with FGD	2	2	3280	2450	6560	4890	6560	4890	
Miscellaneous	0.5 to 10 HP motors		20	10	20	15	20	15	
Total						**4900**		**4900**	

Total Aux. Power		Connected (MW)	Operating (MW)	
FGD System only (SDA+BH)	Base	4.2	2.5	
	Total	**4.2**	**2.5**	
SDA/Baghouse/Booster Fans	Base	9.1	7.4	
	Total	**9.1**	**7.4**	**1.29%**

Summary of DFGD/BAGHOUSE Power Consumption
Muskogee Unit 4 or 5

Inputs:	Capacity	Heat Input	SDA Inlet Flow*	SDA Outlet Flow*	Booster Fan Inlet Flow*	Max. Sulfur in Coal	HHV	Inlet SO_2	Max. Lime*
	MWg	mmBtu/hr	acfm	acfm	acfm	%	Btu/lb	lb/mmBtu	lb/hr
Muskogee Unit 4 or 5	572	5,480	2,046,910	1,846,716	1,890,519	0.48	8,084	1.176	9,541

*From S&L mass balance

	Connected	Operating	Load per Motor HP	Load per Motor kW	CONNECTED HP	CONNECTED kW	OPERATING HP	OPERATING kW	Operating Usage
Absorber Island									
Atomizers	2	2	1020	761	2040	1522	2040	1522	
Penthouse Heaters	2	2		50		100		100	(winter)
Dampers	2	2	5	4	10	7	10	0.1	2% time
Miscellaneous	0.5 to 10 HP motors		30	22	30	22	3	2	10% time
Total						**1652**		**1624**	

	Connected	Operating	Load per Motor HP	Load per Motor kW	CONNECTED HP	CONNECTED kW	OPERATING HP	OPERATING kW	Operating Usage
Reagent Preparation and Recycle Island									
Lime Unloading Blowe	2	1	320	239	640	477	32	24	10% time
Silo Live Bottom	2	1	8	6	16	12	8	6	
Lime Feeder	2	1	5	4	10	7	5	4	
Ball Mill Slaker	2	1	120	90	240	179	120	90	
Slurry Tank Agitator	2	1	40	30	80	60	40	30	
Slurry Feed Pump	2	1	30	22	60	45	30	22	
Recycle Silo Fluidization Air Blowe	2	1	30	22	60	45	30	22	
Recycle Silo Fluidization Air Heate	2	1		40		80		40	
Recycle Slurry Mixer	2	1	150	112	300	224	150	112	
Recycle Feed Pump	2	1	40	30	80	60	40	30	
Miscellaneous	0.5 to 10 HP motors		20	15	20	15	10	7	50% time
Total						**1203**		**387**	

Summary of DFGD/BAGHOUSE Power Consumption
Muskogee Unit 4 or 5

	Connected	Operating	Load per Motor HP	Load per Motor kW	CONNECTED HP	CONNECTED kW	OPERATING HP	OPERATING kW	Operating Usage
Baghouse/Ash Handling Islanc									
Compressor	2	1	540	403	1080	806	270	201	50% time
Hopper Heater	16	16		260		260		130	50% time
Penthouse Heaters / Hopper Enclosure Heaters	12	12		240		240		120	50% time
Transport Air Vac. Blowers	2	1	150	112	300	224	150	112	
Miscellaneous	0.5 to 10 HP motors		50	37	50	37	10	7	20% time
Total						**1567**		**571**	

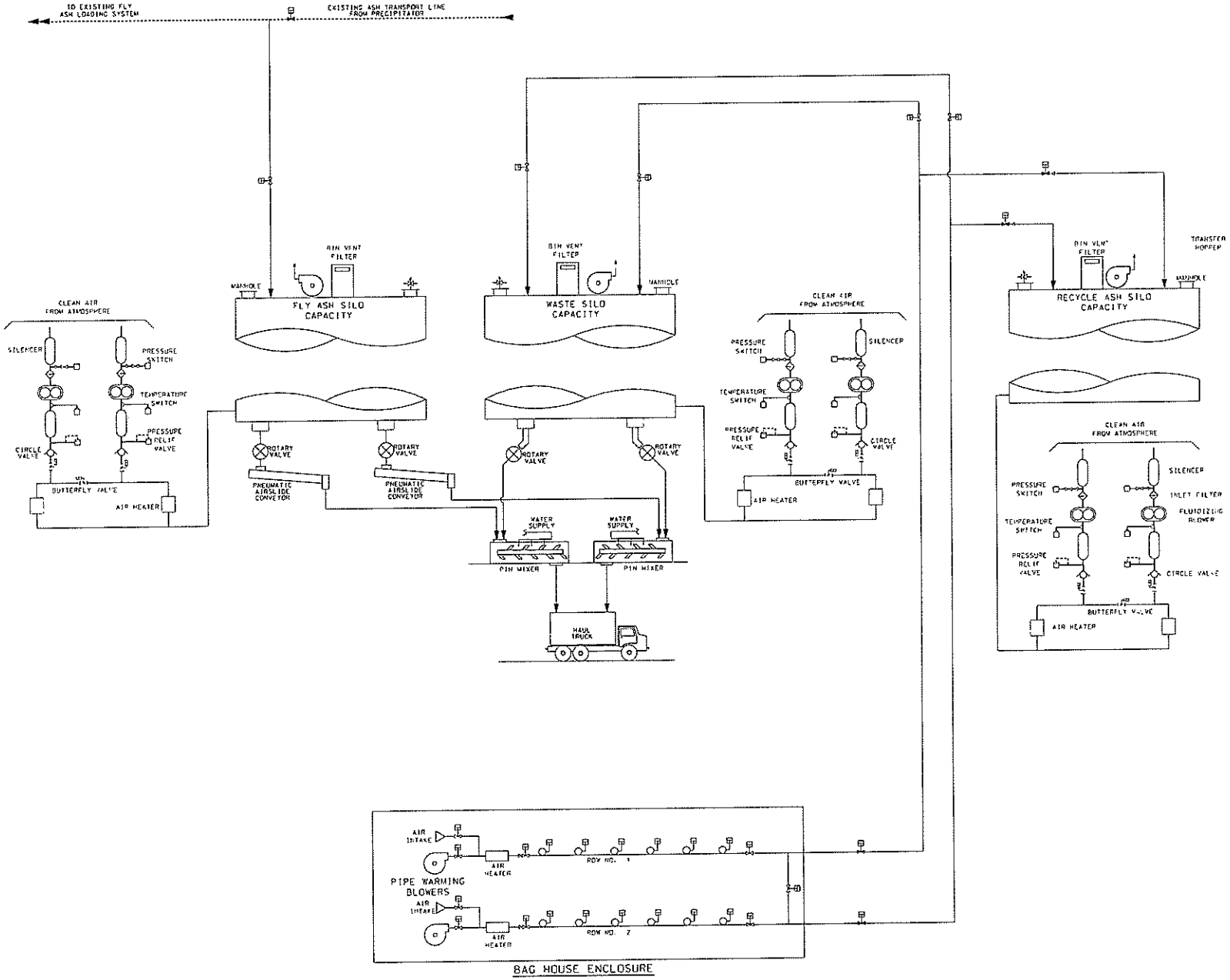
	Connected	Operating	Load per Motor HP	Load per Motor kW	CONNECTED HP	CONNECTED kW	OPERATING HP	OPERATING kW	Operating Usage
Booster Fan System w FGD									
Booster Fan with FGD	2	2	3520	2630	7040	5250	7040	5250	
Miscellaneous	0.5 to 10 HP motors		20	10	20	15	20	15	
Total						**5260**		**5260**	

Total Aux. Power		Connected (MW)	Operating (MW)	
FGD System only (SDA+BH)	Base	4.4	2.6	
	Total	**4.4**	**2.6**	
SDA/Baghouse/Booster Fans	Base	9.7	7.8	
	Total	**9.7**	**7.8**	**1.37%**

Attachment 4

Sooner Station Units 1 and 2

Material Handling Diagrams



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PROJECT

SOONER GENERATING STATION

UNITS 1 & 2
OKLAHOMA GAS & ELECTRIC
RED ROCK, OKLAHOMA

DRAWING TITLE

FLOW DIAGRAM FOR
FLY ASH / WASTE HANDLING
SYSTEM

DRAWING NUMBER	REVISION
SNR-MHS-02	A

SHEET 1 OF 1

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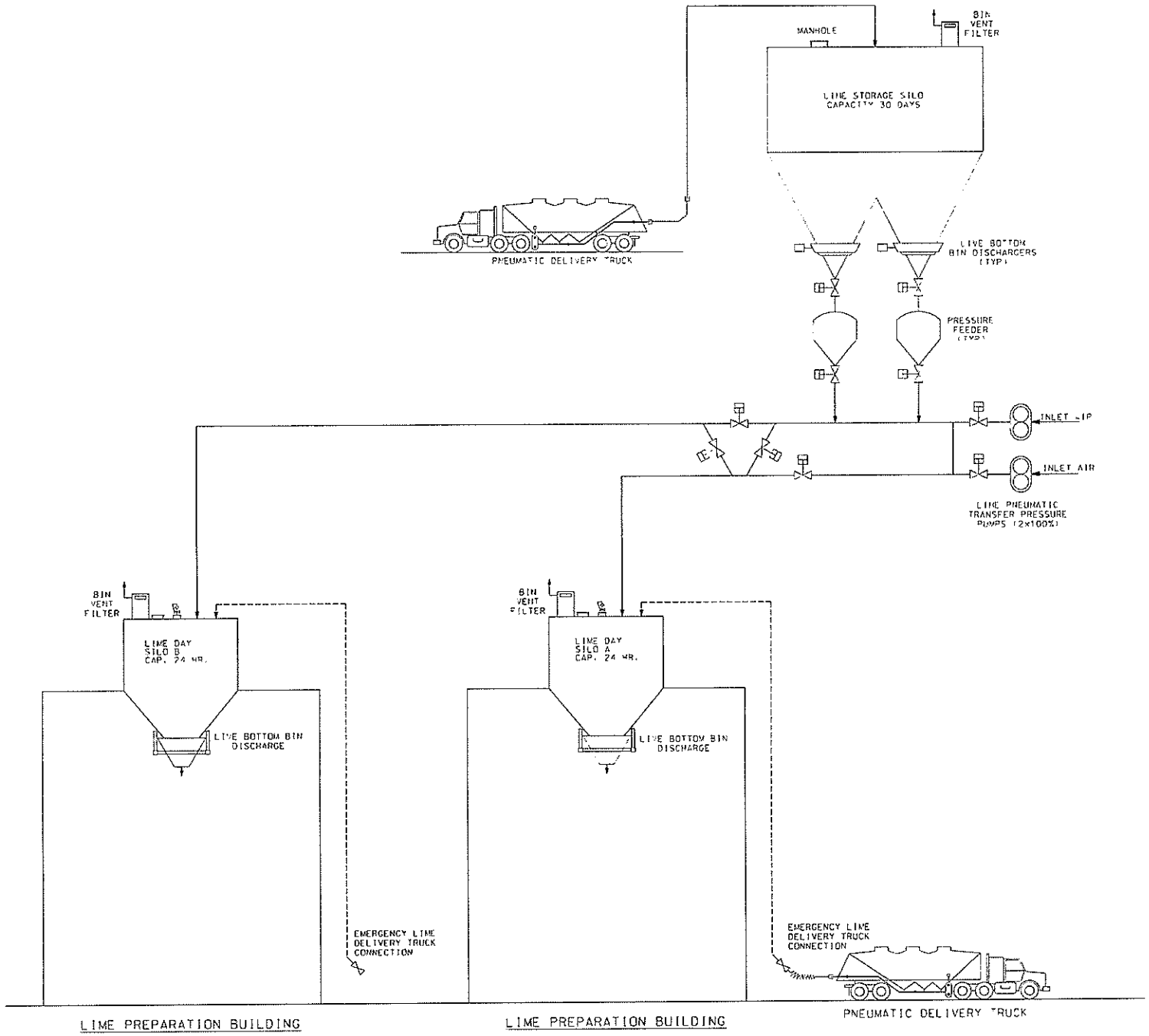
Form DDC-040-01-08, ANSI (Imperial) Microstation Border - Size E - 34 x 44
Revision 9, Revision Date: 12-15-2008



NO.	DATE	DESCRIPTION
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PROJECT

SOONER GENERATING STATION

UNITS 1 & 2
OKLAHOMA GAS & ELECTRIC
RED ROCK, OKLAHOMA

DRAWING TITLE

FLOW DIAGRAM FOR LIME HANDLING SYSTEM

DRAWING NUMBER	REVISION
SNR-MHS-01	A

SHEET 1 OF 1

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Form C00-0401-01-08, ANSI (Imperial) MicroStation Border - Size E - 34 x 44
Revision 9, Revision Date: 12-19-2008

Attachment 5

Summary of Vendor Quotations

OG&E
Sooner Units 1&2

DFGD Budgetary Proposal Pricing

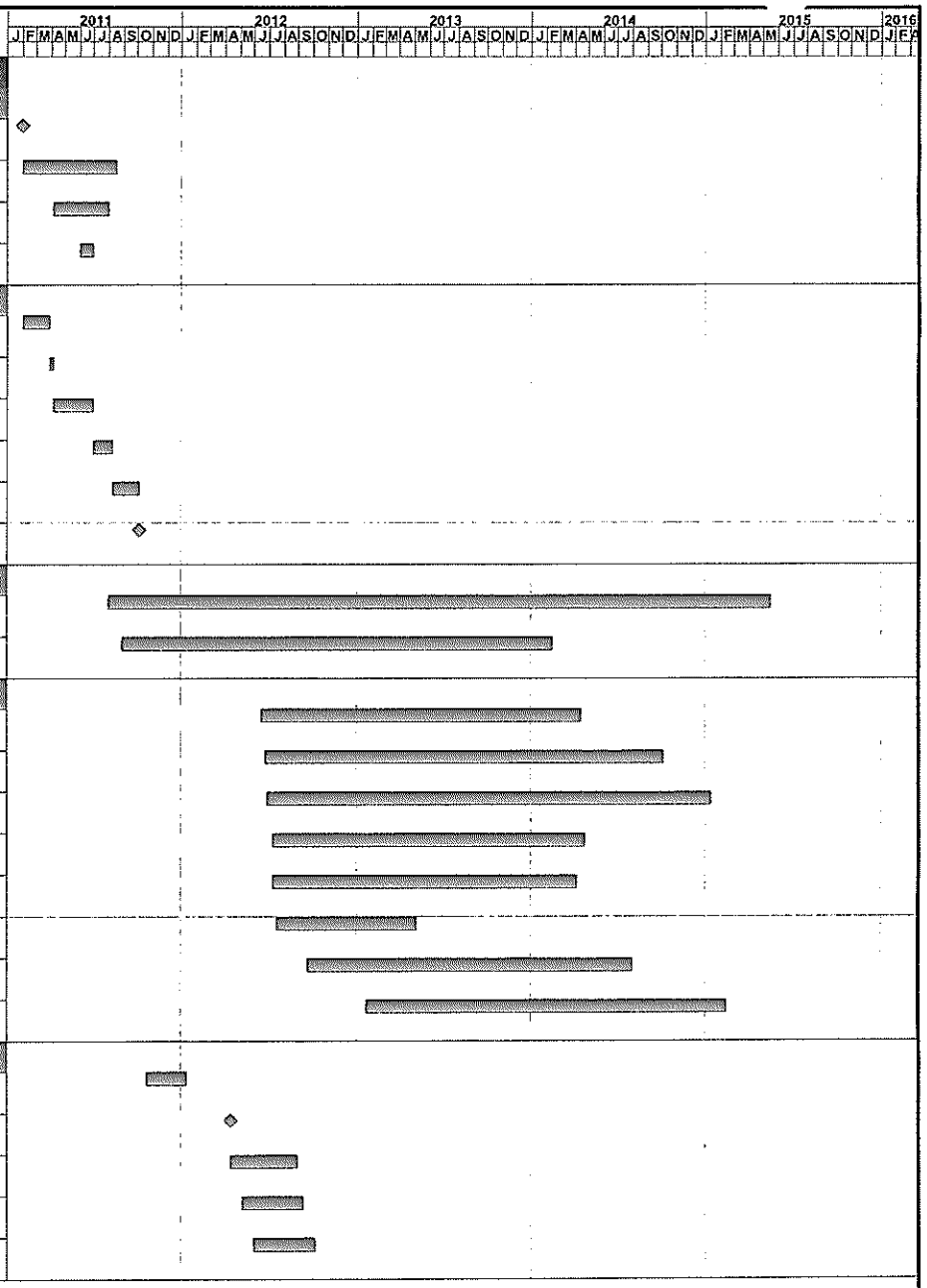
Date: 12/11/2009

PROPOSAL PRICING COMPARISON FOR OG&E - SOONER UNITS 1&2 DFGD SYSTEM				
Equipment Description	**Bidder 1**	**Bidder 2**	**Bidder 3**	**Average Cost**
Lime preparation	$5,010,000	$20,000,000	Incl with Other Misc	
Absorber Equipment	$20,962,000	$16,000,000	$21,400,000	
Recycle System	$4,506,000	$4,000,000	Incl with Other Misc	
Fabric Filter	$13,054,000	$26,000,000	$23,600,000	
Compressor System	$2,670,000	$2,000,000	Incl with Other Misc	
Other Misc Equipment	$10,820,000	$4,000,000	$33,000,000	
Total Equipment (Units 1&2)	**$57,022,000**	**$72,000,000**	**$78,000,000**	**$69,007,333**
S&L Cost Estimate for Sooner 1&2		$70,500,000		
Erection Budget Price (Units 1&2)	**$62,384,000**	**$67,270,000**	**$73,036,000**	**$67,563,333**
S&L Cost Estimate for Sooner 1&2		$65,753,000		
Note: Bidders 2 and 3 provided estimated erection manhours. Budget erection cost is calculated based on current S&L Cost Estimate using $62/mhr for mechanical labor cost (non-union) and 55% markup for Crane+scaffolding+mob/demob+Overtime+Per diem+G&A+Profit				
Note: S&L Cost estimate was performed based on our historical pricing information for Equipment/Material and Labor Costs. Labor costs were developed independently from the three bidders				

Attachment 6

Project Schedule

Activity ID	Activity Description	Orig Dur	Start	Finish
DFGD				
PRELIMINARY ENGINEERING				
SLN1001	Project Authorization	0	01FEB11*	
SLN1G01020	Develop FGDs GAs and Engineering Studies	140	01FEB11	16AUG11
SLN1G01090	Prepare Design Criteria	84	05APR11	01AUG11
SLN1G01608	Prepare Preliminary Site Arrangement Dwgs	23	31MAY11	30JUN11
EPC SPEC				
SLN1110	DFGD Sys EPC Spec - Bid Issue to Client	40	01FEB11	28MAR11
SLN1118	DFGD Sys EPC Spec- Bid Issue to Vendors	5	29MAR11	04APR11
SLN1120	Vendor Bid Period	60	05APR11	27JUN11
SLN1130	Evaluate Bids	30	28JUN11	09AUG11
SLN1140	Negotiation	40	10AUG11	04OCT11
SLN1150	Award EPC	0		04OCT11
PERMITTING				
SLP0000108	FGD Other Permits	978	02AUG11*	15MAY15
SLN2P00001	Air Permit: Dry FGD Prepare/Submit	636	30AUG11	14FEB14
ENGINEERING - ALL UNITS				
SLNSUM1900	Ductwork Design	472	15JUN12	15APR14
SLNSUM0500	BOP Piping & Hanger Design	586	25JUN12	01OCT14
SLNSUM0510	Electrical Design	654	28JUN12	12JAN15
SLNSUM0520	Substructure Design	461	09JUL12	21APR14
SLNSUM0800	Steel Design	450	09JUL12	04APR14
SLNSUM1060	Develop Preliminary P&ID's	206	18JUL12	03MAY13
SLNSUM0550	P&I ID Preparation	482	19SEP12	01AUG14
SLNSUM0600	Electrical Wiring	533	22JAN13	13FEB15
MAJOR PROCUREMENT - ALL UNITS				
SLN1M10000	DFGD Spec - Bid Issue	60	19OCT11	12JAN12
SLN1M10060	DFGD Spec - Award Contract	0		11APR12
SLN1M23600	Fabric Filter Bid/Award	100	12APR12	30AUG12
SLN1M13500	ID Booster Fans - Bid/Award	92	07MAY12	12SEP12
SLN1E17500	Switchyard/TL Upgrades Bid/Award	92	29MAY12	04OCT12



Start Date	31MAY10
Finish Date	26FEB16
Data Date	01JUN10
Run Date	30NOV09 13:26

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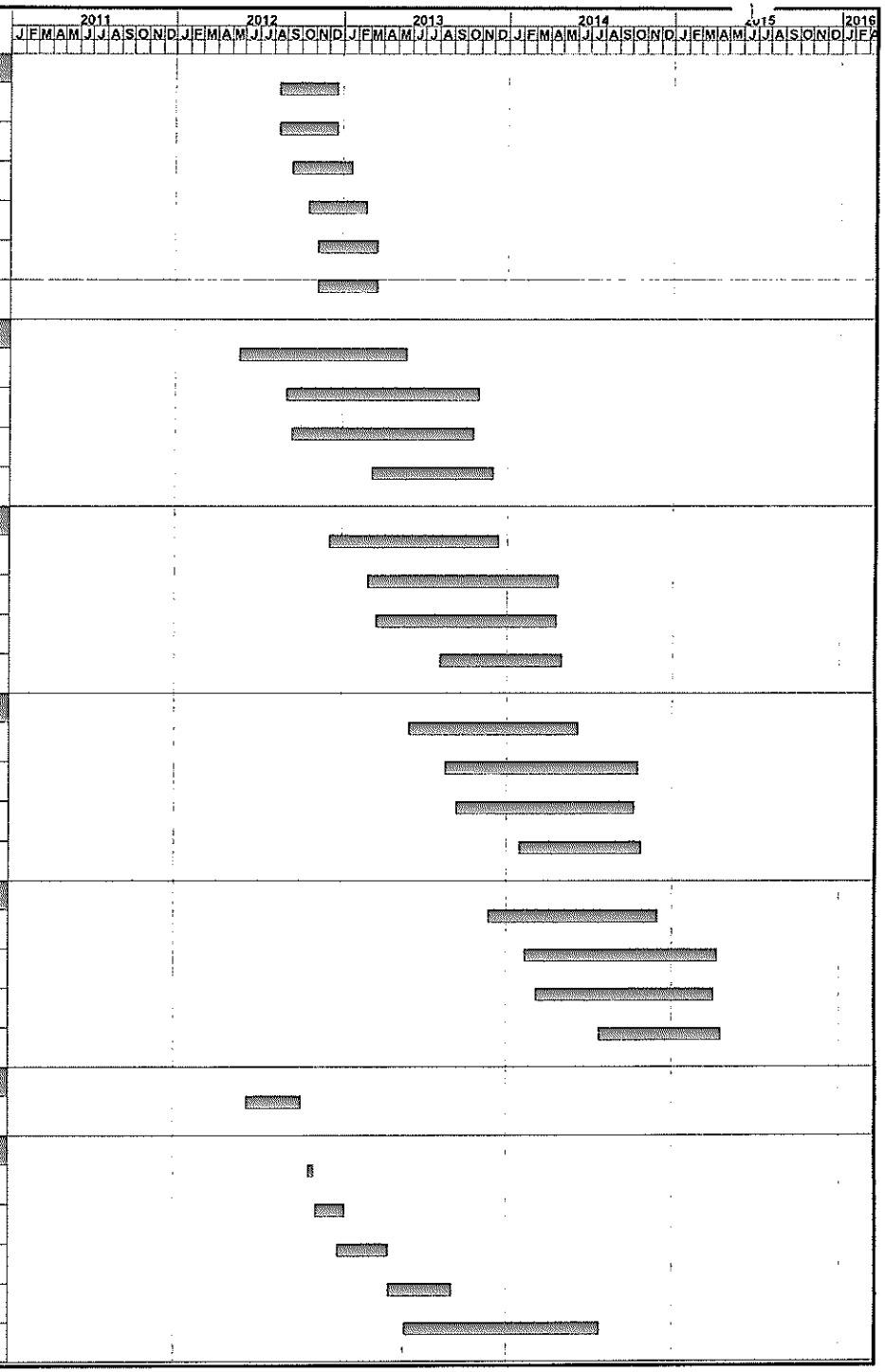
DF01

Sheet 1 of 4

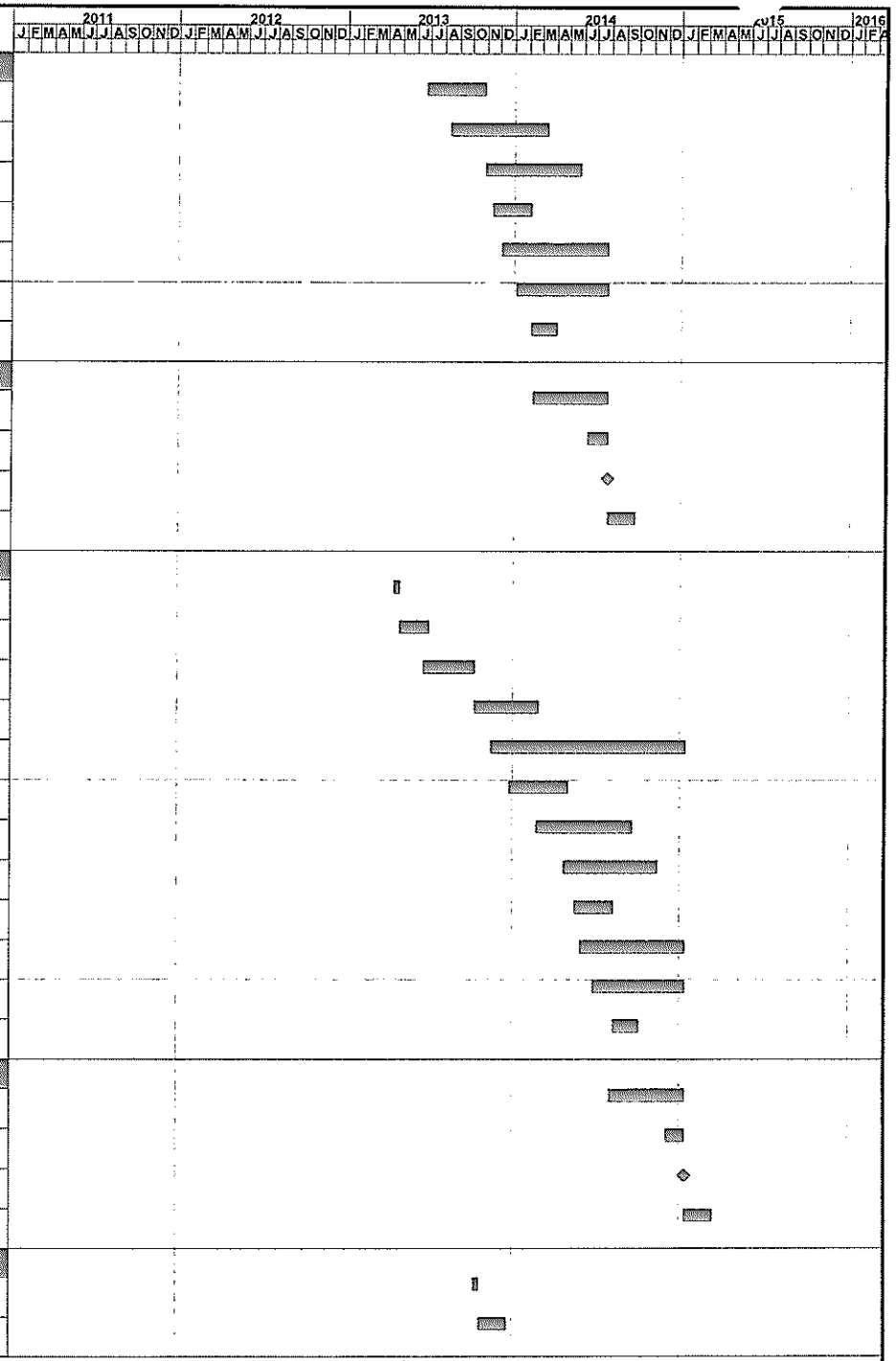
OKLAHOMA GAS & ELECTRIC
Sooner & Muskogee Stations DFGD Prj
SUMMARY SCHEDULE

Sargent & Lundy

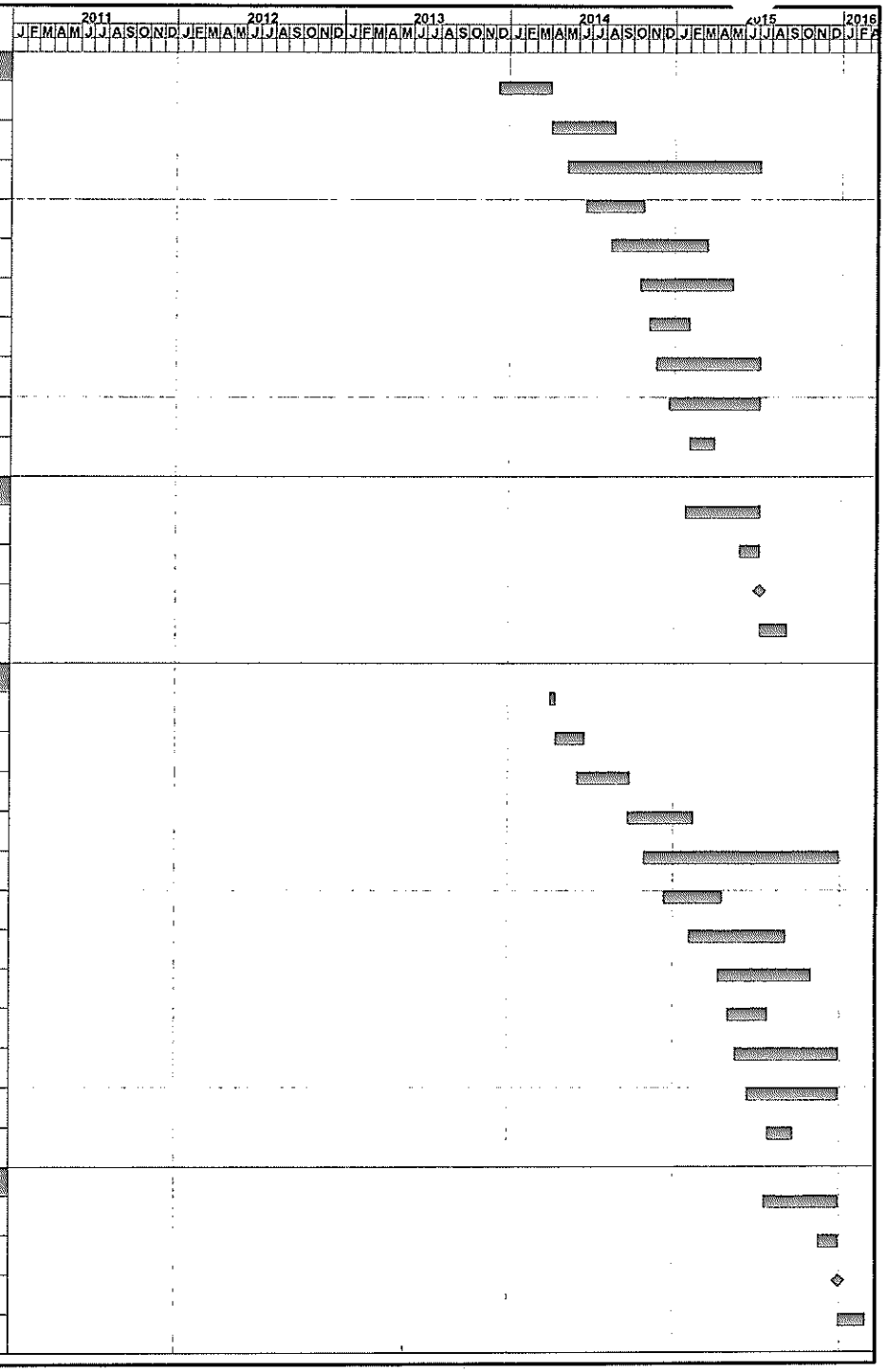
Activity ID	Activity Description	Orig Dur	Start	Finish
MAJOR PROCUREMENT - ALL UNITS				
SLN2S12000	Ductwork Bid/Award	92	13AUG12	18DEC12
SLN2S13000	Structural Steel Bid/Award	92	13AUG12	18DEC12
SLN1ES7000	Aux Transformer Bid/Award	92	13SEP12	22JAN13
SLN2E18000	Medium Voltage Switchgear Spec - Prep/Rvw/Award	92	16OCT12	22FEB13
SLN2F15000	DCS Bid/Award	92	08NOV12	19MAR13
SLN2M16000	Dampers Bid/Award	92	08NOV12	19MAR13
FABRICATION / DELIVERY - SOONER U1				
FDS10010	DFGD Fabrication & Delivery - Sooner U1	262	17MAY12	22MAY13
FDS10020	Fabric Filter Fabrication & Delivery - Sooner U1	300	31AUG12	29OCT13
FDS10030	ID Booster Fan Fab & Delivery - Sooner U1	280	13SEP12	14OCT13
FDS10040	Aux Transformer Fab & Delivery - Sooner U1	190	06MAR13	27NOV13
FABRICATION / DELIVERY - SOONER U2				
FDS20010	DFGD Fabrication & Delivery - Sooner U2	262	05DEC12	10DEC13
FDS20020	Fabric Filter Fabrication & Delivery - Sooner U2	300	25FEB13	23APR14
FDS20030	ID Booster Fan Fab & Delivery - Sooner U2	280	18MAR13	16APR14
FDS20040	Aux Transformer Fab & Delivery - Sooner U2	190	06AUG13	30APR14
FABRICATION / DELIVERY - MUSKOGEE U4				
FDM40010	DFGD Fabrication & Delivery - Muskogee U4	262	30MAY13	04JUN14
FDM40020	Fabric Filter Fab & Delivery - Muskogee U4	300	19AUG13	15OCT14
FDM40030	ID Booster Fan Fab & Delivery - Muskogee U4	280	09SEP13	08OCT14
FDM40040	Aux Transformer Fab & Delivery - Muskogee U4	190	29JAN14	22OCT14
FABRICATION / DELIVERY - MUSKOGEE U5				
FDM50010	DFGD Fabrication & Delivery - Muskogee U5	262	21NOV13	26NOV14
FDM50020	Fabric Filter Fab & Delivery - Muskogee U5	300	11FEB14	09APR15
FDM50030	ID Booster Fan Fab & Delivery - Muskogee U5	280	04MAR14	02APR15
FDM50040	Aux Transformer Fab & Delivery - Muskogee U5	190	23JUL14	16APR15
CONSTRUCTION CONTRACTS				
SLN1S20000	General Work Contract - Prep/Rvw/Award/Spec	85	08JUN12	05OCT12
CONSTRUCTION - SOONER U1				
CMS10010	General Work Contractor Mobilization - Sooner U1	10	22OCT12	02NOV12
CMS10020	U/G Utilities Relocation FGD Area - Sooner U1	45	05NOV12	08JAN13
CMS10030	DFGD Foundations - Sooner U1	80	24DEC12	16APR13
CMS10040	Structural Steel Installation - Sooner U1	100	16APR13	03SEP13
CMS10050	DFGD Erection and Startup - Sooner U1	300	22MAY13	21JUL14



Activity ID	Activity Description	Orig Dur	Start	Finish
CONSTRUCTION - SOONER U1				
CMS10060	ID Booster Fan Area Foundations - Sooner U1	90	24JUN13	28OCT13
CMS10070	Duckwork Installation - Sooner U1	150	15AUG13	14MAR14
CMS10080	Fabric Filter Erection - Sooner U1	145	30OCT13	22MAY14
CMS10090	ID Booster Fan Installation - Sooner U1	60	12NOV13	05FEB14
CMS10100	Electrical Installation - Sooner U1	160	05DEC13	21JUL14
CMS10110	Mechanical Installation - Sooner U1	140	06JAN14	21JUL14
CMS10120	Ductwork Erection ID Fan - Sooner U1	40	06FEB14	02APR14
START-UP - SOONER U1				
SUS10010	FGD Commissioning & Start Up - Sooner U1	140	08FEB14	21JUL14
SUS10020	Tie-in Outage - Sooner U1	37	09JUN14	21JUL14
SUS10030	DFGD in Service - Sooner U1	0		21JUL14
SUS10040	DFGD System Balancing / Performance Testing - S1	52	22JUL14	19SEP14
CONSTRUCTION - SOONER U2				
CMS20010	General Work Contractor Mobilization - Sooner U2	10	15APR13*	26APR13
CMS20020	U/G Utilities Relocation FGD Area - Sooner U2	45	29APR13	28JUN13
CMS20030	DFGD Foundations - Sooner U2	80	17JUN13	07OCT13
CMS20040	Structural Steel Installation - Sooner U2	100	07OCT13	25FEB14
CMS20050	DFGD Erection and Startup - Sooner U2	300	12NOV13	12JAN15
CMS20060	ID Booster Fan Area Foundations - Sooner U2	90	24DEC13	30APR14
CMS20070	Duckwork Installation - Sooner U2	150	20FEB14	18SEP14
CMS20080	Fabric Filter Erection - Sooner U2	145	24APR14	13NOV14
CMS20090	ID Booster Fan Installation - Sooner U2	60	15MAY14	07AUG14
CMS20100	Electrical Installation - Sooner U2	160	29MAY14	12JAN15
CMS20110	Mechanical Installation - Sooner U2	140	26JUN14	12JAN15
CMS20120	Ductwork Erection ID Fan - Sooner U2	40	08AUG14	02OCT14
START-UP - SOONER U2				
SUS20010	FGD Commissioning & Start Up - Sooner U2	140	02AUG14	12JAN15
SUS20020	Tie-in Outage - Sooner U2	37	01DEC14	12JAN15
SUS20030	DFGD in Service - Sooner U2	0		12JAN15
SUS20040	DFGD System Balancing / Performance Testing - S2	52	13JAN15	13MAR15
CONSTRUCTION - MUSKOGEE U4				
CMM40010	General Work Contractor Mobilization - Muskogee4	10	07OCT13*	18OCT13
CMM40020	U/G Utilities Relocation FGD Area - Muskogee U4	45	21OCT13	20DEC13



Activity ID	Activity Description	Orig Dur	Start	Finish
CONSTRUCTION - MUSKOGEE U4				
CMM40030	DFGD Foundations - Muskogee U4	80	09DEC13	01APR14
CMM40040	Structural Steel Installation - Muskogee U4	100	01APR14	19AUG14
CMM40050	DFGD Erection and Startup - Muskogee U4	300	07MAY14	06JUL15
CMM40060	ID Booster Fan Area Foundations - Muskogee U4	90	18JUN14	22OCT14
CMM40070	Duckwork Installation - Muskogee U4	150	14AUG14	13MAR15
CMM40080	Fabric Filter Erection - Muskogee U4	145	16OCT14	08MAY15
CMM40090	ID Booster Fan Installation - Muskogee U4	60	06NOV14	30JAN15
CMM40100	Electrical Installation - Muskogee U4	160	20NOV14	06JUL15
CMM40110	Mechanical Installation - Muskogee U4	140	18DEC14	06JUL15
CMM40120	Ductwork Erection ID Fan - Muskogee U4	40	02FEB15	27MAR15
START-UP - MUSKOGEE U4				
SUM40010	FGD Commissioning & Start Up - Muskogee U4	140	24JAN15	06JUL15
SUM40020	Tie-in Outage - Muskogee U4	37	25MAY15	06JUL15
SUM40030	DFGD in Service - Muskogee U4	0		06JUL15
SUM40040	DFGD System Balancing / Performance Testing - M4	52	07JUL15	04SEP15
CONSTRUCTION - MUSKOGEE U5				
CMM50010	General Work Contractor Mobilization - Muskogee5	10	01APR14*	14APR14
CMM50020	U/G Utilities Relocation FGD Area - Muskogee U5	45	15APR14	16JUN14
CMM50030	DFGD Foundations - Muskogee U5	80	03JUN14	23SEP14
CMM50040	Structural Steel Installation - Muskogee U5	100	23SEP14	11FEB15
CMM50050	DFGD Erection and Startup - Muskogee U5	300	29OCT14	28DEC15
CMM50060	ID Booster Fan Area Foundations - Muskogee U5	90	10DEC14	16APR15
CMM50070	Duckwork Installation - Muskogee U5	150	06FEB15	04SEP15
CMM50080	Fabric Filter Erection - Muskogee U5	145	10APR15	30OCT15
CMM50090	ID Booster Fan Installation - Muskogee U5	60	01MAY15	24JUL15
CMM50100	Electrical Installation - Muskogee U5	160	15MAY15	28DEC15
CMM50110	Mechanical Installation - Muskogee U5	140	12JUN15	28DEC15
CMM50120	Ductwork Erection ID Fan - Muskogee U5	40	27JUL15	18SEP15
START-UP - MUSKOGEE U5				
SUM50010	FGD Commissioning & Start Up - Muskogee U5	140	18JUL15	28DEC15
SUM50020	Tie-in Outage - Muskogee U5	37	16NOV15	28DEC15
SUM50030	DFGD in Service - Muskogee U5	0		28DEC15
SUM50040	DFGD System Balancing / Performance Testing - M5	52	29DEC15	26FEB16



Attachment B

Annualized Costs
Sooner Units 1 & 2
Muskogee Units 4 & 5

TABLE B-1
MUSKOGEE STATION UNIT 4
BART COST EVALUATION - DRY FGD (SDA) WORKSHEET

	INPUT	
	1 x 572 MW-gross	
Case	**PC Boiler**	
Gross Plant Output (MW-gross)	**572**	
Net Plant Output (MW-net)	**527**	Adjusted to account for additional auxiliary power
Approximate Full Load Flue Gas Flow Rate (acfm)	**2,288,000**	
Maximum Heat Input (mmBtu/hr)	**5,480**	
Uncontrolled SO2 Emission Rate (lb/mmBtu)	**0.507**	
Post Dry FGD SO2 Emission Rate (lb/mmBtu)	**0.10**	
Capacity Factor used for Cost Estimates (%)	**90%**	

CAPITAL COSTS	Muskogee Unit 4		Basis
Direct Costs	$162,651,300		Based on Sargent & Lundy's conceptual cost estimating system Direct costs include equipment, material, and labor; plus spare parts, special tools, consumables, and freight. Indirect costs include engineering, procurement, construction management, start-up, commissioning, operator training, and owner's costs
Indirect Costs	$24,045,100		
Contingency	$30,200,900		
Total Plant Cost	$216,897,300		
Escalation	$30,622,900		Escalation and AFUDC were calculated from the estimated distribution of cash flows during the construction period and OG&E's before-tax weighted average cost of capital of 8.66%/year. The 37-day tie-in outage for each unit is assumed to be coordinated with the normal 5-week scheduled outage such that incremental replacement cost is negligible
Allow. for Funds Used During Constr. (AFUDC)	$59,957,000		
Total Plant Investment (TPI)	$307,477,200		
Replacement Power Costs	$0		
Total Capital Requirement (TCR)	**$307,477,200**		
Total Capital Investment ($/kW - gross)	$538		
Capital Recovery Factor	0.1036		See derivation in Table 5
Annualized Capital Costs (Capital Recover Factor x Total Capital Investment)	**$31,854,600**		

OPERATING COSTS			Basis
Operating & Maintenance Costs			
Variable O&M Costs			
Lime Reagent Cost	$1,730,600	$ 105.53	Based on maximum heat input, SO2 removal rate (lb/hr), 0.90 stoichiometry, 90% CaO, 90% capacity factor, and $105.53/ton for lime.
Water Cost	$534,100	$ 2.57	Based on 219,839 lb/hr at full load, 90% capacity factor, and $2.57/1000 gal
FGD Waste Disposal Cost	$1,894,300	$ 40.59	Based on maximum heat input, SO2 removal rate (lb/hr), 90% capacity factor, and $40.59/ton on-site disposal cost. Disposal cost only includes FGD by-products and does not include fly ash
Bag and Cage Replacement Costs	$675,100	$ 3.31	Based on the exhaust gas flow through the baghouse, air-to-cloth ratio of 3.5 for pulse jet baghouse, $3.31/ft2 bag cost (including fabric and hangers), 4% contingency for bag cleaning, and 3 year bag life
Ash Disposal Costs	$0	$ 40.59	Assumed no increase in ash disposal with the fabric filter compared to the existing ESP control system.
Auxiliary Power Cost	$5,812,000	$ 85.92	Based on auxiliary power requirement of 1% (gross) for DFGD plus 0.5% (gross) for the baghouse, 90% capacity factor, and $85.92/MWh.
Total Variable O&M Costs	$10,646,100		
Fixed O&M Costs			
Additional Operators per shift	2.0		Based on S&L O&M estimate for dry FGD
Operating Labor	$1,029,500	$ 58.76	3 shifts/day, 365 days/year @ 58.76/hour (salary + benefits)
Supervisor Labor	$154,400	15.0%	of operating labor. EPA Control Cost Manual, page 2-31
Maintenance Materials	$1,844,900	0.6%	Based on S&L experience on other FGD projects
Maintenance Labor	$1,132,500	110.0%	of operating labor. EPA Control Cost Manual, page 2-31
Total Fixed O&M Cost	$4,161,300		
Indirect Operating Cost			
Property Taxes	$2,613,600	0.85%	Calculated as % of total capital investment (EPA Air Pollution Control Cost
Insurance	$32,200	0.0105%	Manual 6th Ed., page 2-34) Administrative costs are 20% of Fixed O&M
Administration	$832,300	20%	based on S&L experience on other projects
Total Indirect Operating Cost	$3,478,100		
Total Annual Operating Cost	**$18,285,500**		

TOTAL ANNUAL COST	
Annualized Capital Cost	**$31,854,600**
Annual Operating Cost	**$18,285,500**
Total Annual Cost	**$50,140,100**

TABLE B-2
MUSKOGEE STATION UNIT 5
BART COST EVALUATION - DRY FGD (SDA) WORKSHEET

	INPUT	
Case	1 x 572 MW-gross PC Boiler	
Gross Plant Output (MW-gross)	572	
Net Plant Output (MW-net)	527	Adjusted to account for additional auxiliary power
Approximate Full Load Flue Gas Flow Rate (acfm)	2,288,000	
Maximum Heat Input (mmBtu/hr)	5,480	
Uncontrolled SO2 Emission Rate (lb/mmBtu)	0.514	
Post Dry FGD SO2 Emission Rate (lb/mmBtu)	0.10	
Capacity Factor used for Cost Estimates (%)	90%	

CAPITAL COSTS	Muskogee Unit 5	Basis
Direct Costs	$162,651,300	Based on Sargent & Lundy's conceptual cost estimating system. Direct costs include equipment, material, and labor; plus spare parts, special tools, consumables, and freight. Indirect costs include engineering, procurement, construction management, start-up, commissioning, operator training, and owner's costs.
Indirect Costs	$24,045,100	
Contingency	$30,200,900	
Total Plant Cost	$216,897,300	
Escalation	$30,622,900	Escalation and AFUDC were calculated from the estimated distribution of cash flows during the construction period and OG&E's before-tax weighted average cost of capital of 8.66%/year. The 37-day tie-in outage for each unit is assumed to be coordinated with the normal 5-week scheduled outage such that incremental replacement cost is negligible
Allow. for Funds Used During Constr. (AFUDC)	$59,957,000	
Total Plant Investment (TPI)	$307,477,200	
Replacement Power Costs	$0	
Total Capital Requirement (TCR)	**$307,477,200**	
Total Capital Investment ($/kW - gross)	$538	
Capital Recovery Factor	0.1036	See derivation in Table 5
Annualized Capital Costs (Capital Recover Factor x Total Capital Investment)	**$31,854,600**	

OPERATING COSTS			Basis
Operating & Maintenance Costs			
Variable O&M Costs			
Lime Reagent Cost	$1,730,600	$ 105.53	Based on maximum heat input, SO2 removal rate (lb/hr), 0.90 stoichiometry, 90% CaO, 90% capacity factor, and $105.53/ton for lime
Water Cost	$534,100	$ 2.57	Based on 219,839 lb/hr at full load, 90% capacity factor, and $2.57/1000 gal
FGD Waste Disposal Cost	$1,894,300	$ 40.59	Based on maximum heat input, SO2 removal rate (lb/hr), 90% capacity factor, and $40.59/ton on-site disposal cost. Disposal cost only includes FGD by-products and does not include fly ash
Bag and Cage Replacement Costs	$675,100	$ 3.31	Based on the exhaust gas flow through the baghouse, air-to-cloth ratio of 3.5 for pulse jet baghouse, $3.31/ft2 bag cost (including fabric and hangers), 4% contingency for bag cleaning, and 3 year bag life.
Ash Disposal Costs	$0	40.59	Assumed no increase in ash disposal with the fabric filter compared to the existing ESP control system.
Auxiliary Power Cost	$5,812,000	$ 85.92	Based on auxiliary power requirement of 1% (gross) for DFGD plus 0.5% (gross) for the baghouse, 90% capacity factor, and $85.92/MWh.
Total Variable O&M Costs	$10,646,100		
Fixed O&M Costs			
Additional Operators per shift	2.0		Based on S&L O&M estimate for dry FGD
Operating Labor	$1,029,500	$ 58.76	3 shifts/day, 365 days/year @ 58.76/hour (salary + benefits)
Supervisor Labor	$154,400	15.0%	of operating labor. EPA Control Cost Manual, page 2-31
Maintenance Materials	$1,844,900	0.6%	Based on S&L experience on other FGD projects.
Maintenance Labor	$1,132,500	110.0%	of operating labor. EPA Control Cost Manual, page 2-31
Total Fixed O&M Cost	$4,161,300		
Indirect Operating Cost			
Property Taxes	$2,613,600	0.85%	Calculated as % of total capital investment (EPA Air Pollution Control Cost Manual 6th Ed., page 2-34). Administrative costs are 20% of Fixed O&M based on S&L experience on other projects.
Insurance	$32,200	0.0105%	
Administration	$832,300	20%	
Total Indirect Operating Cost	$3,478,100		
Total Annual Operating Cost	**$18,285,500**		

TOTAL ANNUAL COST	
Annualized Capital Cost	**$31,854,600**
Annual Operating Cost	**$18,285,500**
Total Annual Cost	**$50,140,100**

TABLE B-3
SOONER STATION UNIT 1
BART COST EVALUATION - DRY FGD (SDA) WORKSHEET

	INPUT	
	1 x 569 MW-gross	
Case	PC Boiler	
Gross Plant Output (MW-gross)	**569**	
Net Plant Output (MW-net)	**524**	Adjusted to account for additional auxiliary power
Approximate Full Load Flue Gas Flow Rate (acfm)	**2,276,000**	
Maximum Heat Input (mmBtu/hr)	**5,116**	
Uncontrolled SO2 Emission Rate (lb/mmBtu)	**0.509**	
Post Dry FGD SO2 Emission Rate (lb/mmBtu)	**0.10**	
Capacity Factor used for Cost Estimates (%)	**90%**	

CAPITAL COSTS	Sooner Unit 1	Basis
Direct Costs	$162,651,300	Based on Sargent & Lundy's conceptual cost estimating system. Direct costs include equipment, material, and labor; plus spare parts, special tools, consumables, and freight. Indirect costs include engineering, procurement, construction management, start-up, commissioning, operator training, and owner's costs.
Indirect Costs	$24,045,100	
Contingency	$29,336,700	
Total Plant Cost	$216,033,100	
Escalation	$23,301,500	Escalation and AFUDC were calculated from the estimated distribution of cash flows during the construction period and OG&E's before-tax weighted average cost of capital of 8.66%/year. The 37-day tie-in outage for each unit is assumed to be coordinated with the normal 5-week scheduled outage such that incremental replacement cost is negligible
Allow. for Funds Used During Constr. (AFUDC)	$52,960,300	
Total Plant Investment (TPI)	$292,294,900	
Replacement Power Costs	$0	
Total Capital Requirement (TCR)	**$292,294,900**	
Total Capital Investment ($/kW - gross)	$514	
Capital Recovery Factor	0.1036	See derivation in Table 5
Annualized Capital Costs (Capital Recover Factor x Total Capital Investment)	**$30,281,800**	

OPERATING COSTS			Basis
Operating & Maintenance Costs			
Variable O&M Costs			
Lime Reagent Cost	$1,826,900	$ 118.80	Based on maximum heat input, SO2 removal rate (lb/hr), 0.90 stoichiometry, 90% CaO, 90% capacity factor, and $118.80/ton for lime
Water Cost	$95,100	$ 0.49	Based on 205,256 lb/hr at full load, 90% capacity factor, and $0.49/1000 gal
FGD Waste Disposal Cost	$1,733,500	$ 39.60	Based on maximum heat input, SO2 removal rate (lb/hr), 90% capacity factor, and $39.60/ton on-site disposal cost. Disposal cost only includes FGD by-products and does not include fly ash
Bag and Cage Replacement Costs	$653,300	$ 3.22	Based on the exhaust gas flow through the baghouse, air-to-cloth ratio of 3.5 for pulse jet baghouse, $3.22/ft2 bag cost (including fabric and hangers), 4% contingency for bag cleaning, and 3 year bag life
Ash Disposal Costs	$0	$ 39.60	Assumed no increase in ash disposal with the fabric filter compared to the existing ESP control system.
Auxiliary Power Cost	$5,640,900	$ 83.83	Based on auxiliary power requirement of 1% (gross) for DFGD plus 0.5% (gross) for the baghouse, 90% capacity factor, and $83.83/MWh.
Total Variable O&M Costs	$9,949,700		
Fixed O&M Costs			
Additional Operators per shift	2.0	2	Based on S&L O&M estimate for dry FGD
Operating Labor	$1,004,400	$ 57.33	3 shifts/day, 365 days/year @ 57.33/hour (salary + benefits)
Supervisor Labor	$150,700	15.0%	of operating labor. EPA Control Cost Manual, page 2-31
Maintenance Materials	$1,753,800	0.6%	Based on S&L experience on other FGD projects
Maintenance Labor	$1,104,800	110.0%	of operating labor. EPA Control Cost Manual, page 2-31
Total Fixed O&M Cost	$4,013,700		
Indirect Operating Cost			
Property Taxes	$1,753,800	0.60%	Calculated as % of total capital investment (EPA Air Pollution Control Cost Manual 6th Ed., page 2-34). Administrative costs are 20% of Fixed O&M based on S&L experience on other projects
Insurance	$30,600	0.0105%	
Administration	$802,700	20%	
Total Indirect Operating Cost	$2,587,100		
Total Annual Operating Cost	**$16,550,500**		
TOTAL ANNUAL COST			
Annualized Capital Cost	**$30,281,800**		
Annual Operating Cost	**$16,550,500**		
Total Annual Cost	**$46,832,300**		

TABLE B-4
SOONER STATION UNIT 2
BART COST EVALUATION - DRY FGD (SDA) WORKSHEET

	INPUT	
	1 x 569 MW-gross	
Case	**PC Boiler**	
Gross Plant Output (MW-gross)	**569**	
Net Plant Output (MW-net)	**524**	Adjusted to account for additional auxiliary power
Approximate Full Load Flue Gas Flow Rate (acfm)	**2,276,000**	
Maximum Heat Input (mmBtu/hr)	**5,116**	
Uncontrolled SO2 Emission Rate (lb/mmBtu)	**0.516**	
Post Dry FGD SO2 Emission Rate (lb/mmBtu)	**0.10**	
Capacity Factor used for Cost Estimates (%)	**90%**	

CAPITAL COSTS	Sooner Unit 2		Basis
Direct Costs	$162,651,300		Based on Sargent & Lundy's conceptual cost estimating system. Direct costs include equipment, material, and labor; plus spare parts, special tools, consumables, and freight. Indirect costs include engineering, procurement, construction management, start-up, commissioning, operator training, and owner's costs.
Indirect Costs	$24,045,100		
Contingency	$29,336,700		
Total Plant Cost	$216,033,100		
Escalation	$23,301,500		Escalation and AFUDC were calculated from the estimated distribution of cash flows during the construction period and OG&E's before-tax weighted average cost of capital of 8.66%/year. The 37-day tie-in outage for each unit is assumed to be coordinated with the normal 5-week scheduled outage such that incremental replacement cost is negligible
Allow. for Funds Used During Constr. (AFUDC)	$52,960,300		
Total Plant Investment (TPI)	$292,294,900		
Replacement Power Costs	$0		
Total Capital Requirement (TCR)	**$292,294,900**		
Total Capital Investment ($/kW - gross)	$514		
Capital Recovery Factor	0.1036		See derivation in Table 5
Annualized Capital Costs (Capital Recover Factor x Total Capital Investment)	**$30,281,800**		
OPERATING COSTS			**Basis**
Operating & Maintenance Costs			
Variable O&M Costs			
Lime Reagent Cost	$1,826,900	$ 118.80	Based on maximum heat input, SO2 removal rate (lb/hr), 0.90 stoichiometry, 90% CaO, 90% capacity factor, and $118.80/ton for lime.
Water Cost	$95,100	$ 0.49	Based on 205,256 lb/hr at full load, 90% capacity factor, and $0.49/1000 gal
FGD Waste Disposal Cost	$1,733,500	$ 39.60	Based on maximum heat input, SO2 removal rate (lb/hr), 90% capacity factor, and $39.60/ton on-site disposal cost. Disposal cost only includes FGD by-products and does not include fly ash.
Bag and Cage Replacement Costs	$653,300	$ 3.22	Based on the exhaust gas flow through the baghouse, air-to-cloth ratio of 3.5 for pulse jet baghouse, $3.22/ft2 bag cost (including fabric and hangers), 4% contingency for bag cleaning, and 3 year bag life.
Ash Disposal Costs	$0	$ 39.60	Assumed no increase in ash disposal with the fabric filter compared to the existing ESP control system
Auxiliary Power Cost	$5,640,900	$ 83.83	Based on auxiliary power requirement of 1% (gross) for DFGD plus 0.5% (gross) for the baghouse, 90% capacity factor, and $83.83/MWh.
Total Variable O&M Costs	$9,949,700		
Fixed O&M Costs			
Additional Operators per shift	2.0	2	Based on S&L O&M estimate for dry FGD
Operating Labor	$1,004,400	$ 57.33	3 shifts/day, 365 days/year @ 57.33/hour (salary + benefits)
Supervisor Labor	$150,700	15.0%	of operating labor. EPA Control Cost Manual, page 2-31
Maintenance Materials	$1,753,800	0.6%	Based on S&L experience on other FGD projects.
Maintenance Labor	$1,104,800	110.0%	of operating labor. EPA Control Cost Manual, page 2-31
Total Fixed O&M Cost	$4,013,700		
Indirect Operating Cost			
Property Taxes	$1,753,800	0.60%	Calculated as % of total capital investment (EPA Air Pollution Control Cost
Insurance	$30,600	0.0105%	Manual 6th Ed., page 2-34). Administrative costs are 20% of Fixed O&M
Administration	$802,700	20%	based on S&L experience on other projects.
Total Indirect Operating Cost	$2,587,100		
Total Annual Operating Cost	**$16,550,500**		
TOTAL ANNUAL COST			
Annualized Capital Cost	**$30,281,800**		
Annual Operating Cost	**$16,550,500**		
Total Annual Cost	**$46,832,300**		

Table B-5
Annual and Levelized Capital Charges
Real Rates Excluding Inflation

Calendar Year		2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Operating Year		1	2	3	4	5	6	7	8	9	10	11	12
Tax Depreciation		5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%
Debt Balance		44,300,000	42,085,000	39,870,000	37,655,000	35,440,000	33,225,000	31,010,000	28,795,000	26,580,000	24,365,000	22,150,000	19,935,000
Equity Balance		55,700,000	52,915,000	50,130,000	47,345,000	44,560,000	41,775,000	38,990,000	36,205,000	33,420,000	30,635,000	27,850,000	25,065,000
	Levelized Values												
Capital Recovery	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Debt Return	932,578	1,525,649	1,449,366	1,373,084	1,296,801	1,220,519	1,144,237	1,067,954	991,672	915,389	839,107	762,824	686,542
Equity Return	2,740,413	4,483,171	4,259,012	4,034,854	3,810,695	3,586,537	3,362,378	3,138,220	2,914,061	2,689,902	2,465,744	2,241,585	2,017,427
Income Taxes	1,688,180	2,761,772	2,623,684	2,485,595	2,347,506	2,209,418	2,071,329	1,933,241	1,795,152	1,657,063	1,518,975	1,380,886	1,242,798
Property Taxes and Insurance	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Capital Charges	10,361,171	13,770,592	13,332,062	12,893,533	12,455,003	12,016,473	11,577,944	11,139,414	10,700,885	10,262,355	9,823,825	9,385,296	8,946,766
Annual Rate (% of initial capital investment)		13.77%	13.33%	12.89%	12.46%	12.02%	11.58%	11.14%	10.70%	10.26%	9.82%	9.39%	8.95%
Levelized Rate	10.36%												
Income Statement (Check)													
Revenue Requirements		13,770,592	13,332,062	12,893,533	12,455,003	12,016,473	11,577,944	11,139,414	10,700,885	10,262,355	9,823,825	9,385,296	8,946,766
Property Taxes and Insurance		0	0	0	0	0	0	0	0	0	0	0	0
EBITDA		13,770,592	13,332,062	12,893,533	12,455,003	12,016,473	11,577,944	11,139,414	10,700,885	10,262,355	9,823,825	9,385,296	8,946,766
Depreciation		5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
EBIT		8,770,592	8,332,062	7,893,533	7,455,003	7,016,473	6,577,944	6,139,414	5,700,885	5,262,355	4,823,825	4,385,296	3,946,766
Interest		1,525,649	1,449,366	1,373,084	1,296,801	1,220,519	1,144,237	1,067,954	991,672	915,389	839,107	762,824	686,542
EBT		7,244,943	6,882,696	6,520,449	6,158,202	5,795,954	5,433,707	5,071,460	4,709,213	4,346,966	3,984,719	3,622,472	3,260,224
Income Taxes													
Cash		2,761,772	2,623,684	2,485,595	2,347,506	2,209,418	2,071,329	1,933,241	1,795,152	1,657,063	1,518,975	1,380,886	1,242,798
Deferred		0	0	0	0	0	0	0	0	0	0	0	0
Total		2,761,772	2,623,684	2,485,595	2,347,506	2,209,418	2,071,329	1,933,241	1,795,152	1,657,063	1,518,975	1,380,886	1,242,798
Net Income		4,483,171	4,259,012	4,034,854	3,810,695	3,586,537	3,362,378	3,138,220	2,914,061	2,689,902	2,465,744	2,241,585	2,017,427
Equity Return (Check)		4,483,171	4,259,012	4,034,854	3,810,695	3,586,537	3,362,378	3,138,220	2,914,061	2,689,902	2,465,744	2,241,585	2,017,427
Tax Calculations:													
EBITDA		13,770,592	13,332,062	12,893,533	12,455,003	12,016,473	11,577,944	11,139,414	10,700,885	10,262,355	9,823,825	9,385,296	8,946,766
Tax Depreciation		5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
EBIT		8,770,592	8,332,062	7,893,533	7,455,003	7,016,473	6,577,944	6,139,414	5,700,885	5,262,355	4,823,825	4,385,296	3,946,766
Interest		1,525,649	1,449,366	1,373,084	1,296,801	1,220,519	1,144,237	1,067,954	991,672	915,389	839,107	762,824	686,542
EBT		7,244,943	6,882,696	6,520,449	6,158,202	5,795,954	5,433,707	5,071,460	4,709,213	4,346,966	3,984,719	3,622,472	3,260,224
Taxes		2,761,772	2,623,684	2,485,595	2,347,506	2,209,418	2,071,329	1,933,241	1,795,152	1,657,063	1,518,975	1,380,886	1,242,798
Rate Base - Year Begin		100,000,000	95,000,000	90,000,000	85,000,000	80,000,000	75,000,000	70,000,000	65,000,000	60,000,000	55,000,000	50,000,000	45,000,000
Book Depreciation		5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Deferred Taxes		0	0	0	0	0	0	0	0	0	0	0	0
Net Book		95,000,000											
Rate Base - Year End		95,000,000	90,000,000	85,000,000	80,000,000	75,000,000	70,000,000	65,000,000	60,000,000	55,000,000	50,000,000	45,000,000	40,000,000

Table B-5
Annual and Levelized Capital Charges
Real Rates Excluding Inflation

Calendar Year		2026	2027	2028	2029	2030	2031	2032	2033
Operating Year		13	14	15	16	17	18	19	20
Tax Depreciation		5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%	5.000%
Debt Balance		17,720,000	15,505,000	13,290,000	11,075,000	8,860,000	6,645,000	4,430,000	2,215,000
Equity Balance		22,280,000	19,495,000	16,710,000	13,925,000	11,140,000	8,355,000	5,570,000	2,785,000
	Levelized Values								
Capital Recovery	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Debt Return	932,578	610,260	533,977	457,695	381,412	305,130	228,847	152,565	76,282
Equity Return	2,740,413	1,793,268	1,569,110	1,344,951	1,120,793	896,634	672,476	448,317	224,159
Income Taxes	1,688,180	1,104,709	966,620	828,532	690,443	552,354	414,266	276,177	138,089
Property Taxes and Insurance	0	0	0	0	0	0	0	0	0
Total Capital Charges	10,361,171	8,508,237	8,069,707	7,631,178	7,192,648	6,754,118	6,315,589	5,877,059	5,438,530
Annual Rate (% of initial capital investment)		8.51%	8.07%	7.63%	7.19%	6.75%	6.32%	5.88%	5.44%
Levelized Rate	10.36%								
Income Statement (Check)									
Revenue Requirements		8,508,237	8,069,707	7,631,178	7,192,648	6,754,118	6,315,589	5,877,059	5,438,530
Property Taxes and Insurance		0	0	0	0	0	0	0	0
EBITDA		8,508,237	8,069,707	7,631,178	7,192,648	6,754,118	6,315,589	5,877,059	5,438,530
Depreciation		5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
EBIT		3,508,237	3,069,707	2,631,178	2,192,648	1,754,118	1,315,589	877,059	438,530
Interest		610,260	533,977	457,695	381,412	305,130	228,847	152,565	76,282
EBT		2,897,977	2,535,730	2,173,483	1,811,236	1,448,989	1,086,741	724,494	362,247
Income Taxes									
Cash		1,104,709	966,620	828,532	690,443	552,354	414,266	276,177	138,089
Deferred		0	0	0	0	0	0	0	0
Total		1,104,709	966,620	828,532	690,443	552,354	414,266	276,177	138,089
Net Income		1,793,268	1,569,110	1,344,951	1,120,793	896,634	672,476	448,317	224,159
Equity Return (Check)		1,793,268	1,569,110	1,344,951	1,120,793	896,634	672,476	448,317	224,159
Tax Calculations:									
EBITDA		8,508,237	8,069,707	7,631,178	7,192,648	6,754,118	6,315,589	5,877,059	5,438,530
Tax Depreciation		5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
EBIT		3,508,237	3,069,707	2,631,178	2,192,648	1,754,118	1,315,589	877,059	438,530
Interest		610,260	533,977	457,695	381,412	305,130	228,847	152,565	76,282
EBT		2,897,977	2,535,730	2,173,483	1,811,236	1,448,989	1,086,741	724,494	362,247
Taxes		1,104,709	966,620	828,532	690,443	552,354	414,266	276,177	138,089
Rate Base - Year Begin		40,000,000	35,000,000	30,000,000	25,000,000	20,000,000	15,000,000	10,000,000	5,000,000
Book Depreciation		5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000	5,000,000
Deferred Taxes		0	0	0	0	0	0	0	0
Net Book									
Rate Base - Year End		35,000,000	30,000,000	25,000,000	20,000,000	15,000,000	10,000,000	5,000,000	0

Attachment C

BART Comparison Table

BART Cost Evaluation
SO_2 Control

Facility		Dry FGD/SDA ESP	Dry FGD/SDA ESP	Dry FGD/SDA ESP	Dry FGD/SDA ESP	Dry FGD/SDA ESP	Dry FGD/SDA ESP	Dry FGD/SDA ESP	Dry FGD/SDA ESP	Dry FGD/SDA ESP	Dry FGD/SDA ESP	Dry FGD/SDA ESP	Dry FGD/SDA ESP	Dry FGD/SDA ESP	Dry FGD/SDA ESP	Remarks
Plant		MUSKOGEE STATION	MUSKOGEE STATION	SONNER STATION	SONNER STATION	GERALD ANDERSON	GERALD ANDERSON	SEMINOLE CITY	SEMINOLE CITY	SOONER STATION	SOONER STATION	MUSKOGEE STATION	MUSKOGEE STATION	SEMINOLE CITY	SEMINOLE CITY	
Unit		UNIT 4	UNIT 5	UNIT 1	UNIT 2	UNIT 1	UNIT 2	UNIT 1	UNIT 2	UNIT 1	UNIT 2	UNIT 1	UNIT 2	UNIT 1	UNIT 2	
Date		December 2009	December 2009	December 2009	December 2009	March 2009	March 2009	August 2009	August 2009	November 2009	May 2009	May 2009	December 2009	December 2009	August 2009	
Rating (gross)	MW	552	573	549	549	750	750	855	855	447	491	491	374	218	218	Nameplate MW = 2004 net from EIA 923 report
Rating (net)	MW	527	552	524	524	700	700	816	816	440	464	470	350	205	205	5-yr
Year Input	yrs/Facility	4,439	4,439	4,314	4,314	2,933	2,763	6,379	6,221	5,553	6,774	6,773	3,858	7,150	6,779	Analysis - highest rolling 12 month data - more conv
Capacity Factor	%	90%	90%	90%	90%	100%	100%	89%	89%	89%	89%	89%	90%	90%	90%	Analysis - average 2 yr CEMS
Minimum Uptime/Year	hours/yr	7,884	7,884	7,884	7,884	8,760	8,760	7,884	7,884	7,884	7,884	7,884	7,884	7,884	7,884	
Capacity Not Recovered AAPP																
Amortization Life	yrs	20	20	20	20	20	20	20	20	20	20	20	20	20	20	
Interest Rate	%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%	OGAE - interest rate is not an input value
Capital Cost Recovery Factor		0.0736	0.0736	0.0736	0.0736	0.0736	0.0736	0.0736	0.0736	0.0736	0.0736	0.0736	0.0736	0.0736	0.0736	OGAE - Implied every 20 years, includes inter on bubble, amortized w/ inflation DF20 at OGAE 3% inflation
Energy Impact	% or MW	1.9%	1.9%	1.9%	1.9%	11.5 MW	11.5 MW	13.6 MW	13.6 MW	4.5 MW	Not specified in BART	Not specified in BART	1.1% or 2.4 MW	1.7% or 1.5 MW	1% or 0 MW	
Cost		Not determined yet	Not determined yet	Not determined yet	Not determined yet	Not determined yet	Not determined yet	Not determined yet	Not determined yet	Not determined yet	Not determined yet	Not determined yet	Not determined yet	Not determined yet	Not determined yet	
Fuel Sulfur Content	%	0.30 - 0.37	0.30 - 0.37	0.30 - 0.37	0.30 - 0.37	0.7	0.7	0.7	0.75	0.87 - 1.00	0.15 - 0.49	0.15 - 0.49	0.50 - 1.02	0.50 - 1.02	0.50	Sonner - Coal mined from Powder River Basin, low sulfur subbituminous coal (0.3% - 0.37% sulfur, 8,800 Btu/lb) Muskogee - Coal mined from Powder River Basin, low sulfur subbituminous coal (0.3% - 0.37% sulfur, 8,800 Btu/lb) Gerald Anderson - Coal mined from Powder River Basin, low sulfur subbituminous coal (0.7% sulfur, 8,800 Btu/lb) Seminole City - Low Sulfur Coal (0.15% - 0.49% sulfur, 8,800 Btu/lb) Seminole City - Low Sulfur Coal (0.50% - 1.02% sulfur, 8,800 Btu/lb)
EMISSIONS																
BART Baseline Emission Rate	lb/mmBtu	0.06*	0.41	0.50	0.50	0.75	0.75	0.95	0.94	0.61	0.90	0.90	1.10	1.16	0.85	Gerald Anderson - permanent 24 hour test (June from 2003-2005) data Sonner - Stack test data and operating parameters provided in Table 3-1 of BART Report Muskogee - Stack test rolling 12 month test before 2004-2006 Seminole - Stack test average of 3 tests in June Seminole City - emissions related 24-hour maximum emission Lower than base emissions
BART Baseline Annual Mass Emissions	tons/yr	9,181	9,706	9,962	9,962	23,291	23,932	32,496	32,140	23,972	26,906	26,906	6,479	11,847	7,184	Calculation methodology
Expected SO2 Emission Rate	lb/mmBtu	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	Stay above based on 0.15 lb/mmBtu value
Expected SO2 Emissions	tons/yr	2,369	2,369	2,597	2,597	4,657	5,123	7,215	7,139	3,445	2,729	2,729	1,951	1,184	1,437	Calculation methodology
Expected SO2 Emission Reduction	tons/yr	6,811	7,336	7,365	7,365	18,633	18,809	25,281	25,001	20,527	24,176	24,176	4,528	10,663	5,747	Overall Gerald Anderson Potential emissions
% Removed	%	72.0%	75.5%	73.9%	73.9%	79.9%	78.6%	77.8%	78.2%	85.6%	89.9%	89.9%	69.9%	90.0%	80.0%	
Visibility Improvement - Sum of Class I Areas	deciv	4.217		2.130		Not Available		Not Available		8.812	3.678		1.916	2.176	1.265	Sum of visibility improvements at all monitoring Class I areas Gerald Anderson - only mentioned in one provided report (page 4 of BART) Sooner Draft - only mentioned in one provided report (pg 3-1 of BART)
Visibility Improvement - Single Class I Area	deciv	1.274		1.176		0.641		1.137		0.669	1.058		1.253	1.156	0.637	Sum of visibility improvements at all monitoring Class I areas Gerald Anderson - only mentioned in one provided report (page 4 of BART) Sooner Draft - only mentioned in one provided report (pg 3-1 of BART)
COSTS																
Total Capital Cost Investment	$	307,477,206	307,477,206	292,296,800	292,296,800	485,845,000	485,845,000	553,448,000	553,448,000	287,293,000	273,350,000	273,350,000	155,900,000	181,211,778	292,626,000	Sonner Draft - cost table includes site improvement, excavation, site clear, construction AFUDC Gerald Anderson - Implies - cost includes contingency, labor premium, EPC premium, bonding premium, sales tax, escalation, contingency on other, overhead and AFUDC
Capital Cost per kW (gross)	$/kw	558	558	558	558	694	694	678	678	643	557	557	445	830	1,341	Gerald Anderson - Sonner Draft - Muskogee Draft - Seminole City - based on kW
Annual Capital Recovery Cost	$/year	22,631,000	22,631,000	21,511,000	21,511,000	35,745,000	35,745,000	40,717,000	40,717,000	21,141,000	20,116,000	20,116,000	11,470,000	13,334,000	21,530,000	Sonner - cost table includes AAPP, Muskogee AAPP, Industry Gerald Anderson - Includes AAPP, Industry Gerald Anderson - Sonner Draft - Muskogee Draft - Seminole City - Industry - Fixed O&M
Annual Operating Costs	$/year	18,704,000	18,704,000	16,550,000	16,550,000	33,926,000	33,926,000	33,000,000	33,000,000	27,676,000	33,455,000	33,455,000	6,500,000	6,551,000	18,500,000	
Total Annual Costs	$/year	41,335,000	41,335,000	38,062,000	38,062,000	69,671,000	69,671,000	73,717,000	73,717,000	48,817,000	53,571,000	53,571,000	17,970,000	19,885,000	40,030,000	
Average Annual Cost Effectiveness	$/ton	7,211	7,211	6,318	7,317	2,710	2,712	2,455	2,431	2,274	2,202	2,204	2,568	2,833	1,779	Gerald Anderson - Sonner - based on 24 hour test - not consistent - Sonner - 24 hour test - consistent with OGAE Muskogee - 3 tests in BART Report - not consistent Sonner - Sonner Draft - Muskogee Draft - Seminole City - based on Annual emissions
Incremental Incremental Improvement Cost - Sum of Class I Areas	$/deciv	29,779,996		33,997,131		Does less pollution Make Sense		Does less pollution Make Sense		4,956,616	23,638,505		1,880,625	8,619,656	29,966,867	Calculated based on visibility improvement at all Class I areas with provided inputs
Incremental Incremental Improvement Cost - Single Class I Area	$/deciv	28,681,137		36,855,211		169,189,000		34,508,000		37,674,000	67,427,737		12,381,000	16,600,000	28,432,000	Calculated based on visibility improvement at Class I area with provided inputs Gerald Anderson - pg 49 of BART Sooner Draft - pg 3-1 of BART - includes Jump 15 & 1.5 - dry scrubber Muskogee - pg 3-12 of BART - includes 1.5 & 15 - wet - IFA Seminole City - pg 3-14 of BART - Sonner Draft - IFA

BART Cost Evaluation
SO_2 Control

Technology		Dry FGD/SDA ST	Dry FGD/SDA ST	Dry FGD/SDA ST	Dry FGD/SDA ST	Dry FGD/SDA ST	Dry FGD/SDA ST	Dry FGD/SDA ST	Dry FGD/SDA ST	Dry FGD/SDA ST	Dry FGD/SDA ST	Dry FGD/SDA ST	Dry FGD/SDA ST	Dry FGD/SDA ST	Dry FGD/SDA ST	
Plant		MUSKOGEE STATION	MUSKOGEE STATION	SONNER STATION	SONNER STATION	GRDA LR OF SITE STEAM	GRDA LR OF SITE STEAM	WHITE BLUFF	WHITE BLUFF	ROSS DATAN	ROSS DATAN	KIMBERLY CLARK	KIMBERLY CLARK	NEAL CITIZEN	NEAL CITIZEN	KANSAS CITY
Unit		UNIT 1	UNIT 2	UNIT 1	UNIT 2	UNIT 1	UNIT 2	UNIT 1	UNIT 2	UNIT 1	UNIT 2	UNIT 5	UNIT 6	UNIT 1	UNIT 2	UNIT 1	Remarks
ANNUAL COST																	
Capital costs - TOTAL		14,867,400	14,865,400	12,963,400	12,963,400	12,826,000	12,826,000	13,500,000	13,500,000	12,974,000	12,974,000	4,861,000	4,861,000	4,799,236	4,236,787	18,146,000	
Fixed O&M - TOTAL	$/year	4,861,000	4,861,000	4,863,700	4,863,700	3,906,000	3,906,000	3,500,000	3,500,000	3,500,000	3,500,000	0	0	1,953,721	2,402,537	2,320,000	
Maintenance (Plant Labor)	$/year	2,977,000	2,977,000	2,919,000	2,919,000	2,911,000	2,911,000	Incl. above	Incl. above	2,000,000	—	—	Incl. above	Incl. above	Incl. above	1,701,000	OG&E's additional operations and maintenance costs (15% of above) White Bluff - 172 M/hr salary, 4 man Bid Forward, 166 M/hr salary + benefits (3 hourly) White Bluff - $40/hr, 16 additional MB man days Ross Dam - $100,000/yr per person Network Plant - depreciation, $/MWh
Operating (Plant Labor)	$/year	2,189,000	2,189,000	2,155,100	2,155,100	955,000	955,000	Incl. above	Incl. above	500,000	—	—	Incl. above	Incl. above	Incl. above	455,000	
Variable costs - TOTAL	$/year	10,838,100	10,838,100	9,939,700	9,939,700	8,919,000	10,074,000	9,994,000	9,994,000	8,269,000	—	4,661,104	4,661,104	3,953,515	3,862,250	8,369,000	
Lime	$/year	1,756,000	1,756,000	1,776,000	1,776,000	7,150,000	7,470,000	Incl. above	Incl. above	4,815,000	5,365,000	1,900,000	1,900,000	939,535	1,391,570	2,935,000	Muskogee - $150/ton lime Sonner - $150/ton lime Grand Gas Station - $105/ton delivered White Bluff - $107/ton, 1.1 TPH Ross Dam - $150/ton Network Plant - $150/ton lime Muskogee - $91,250/ton lime, 1.1 TPH Network Plant - $135/ton lime, Delivered
Water	$/year	531,100	531,100	95,500	95,500	193,000	394,000	Incl. above	Incl. above	500,000	—	—	41,874	112,579	—	—	Muskogee - $270/1,000 gal Sonner - $9.95/1,000 gal Grand Gas Station - $9.95/1,000 gal White Bluff - 1,000 gpm per unit, 6,000,000 gal/month cooling water Ross Dam - 500 gpm, 8,000,000 gal/month cooling water Network Plant - 120 gpm, $1.20/1,000 gal
Solid Waste Disposal	$/year	2,598,000	2,993,000	2,733,000	2,733,000	1,429,000	1,419,000	Incl. above	Incl. above	750,000	—	—	356,487	444,241	1,000,000	—	Muskogee - $/ton, ash disposal Sonner - $19.00/ton ash disposal Grand Gas Station - $19/ton White Bluff - $9.88/ton Ross Dam - $10/ton Kimberly - $28.35/ton Network Plant - $50/ton Network Plant - Cement manufacturer Sonner - $19.00/ton ash disposal Grand Gas Station - $19/ton White Bluff - $9.88/ton Ross Dam - $10/ton Kimberly - $28.35/ton Network Plant - $50/ton Network Plant - Cement manufacturer
In Ash Disposal	$/year	0	0	0	0	—	—	—	—	—	—	—	—	—	—	—	OG&E's - Cement manufacturer, Company Owned Cement Kiln, Bartlesville
Disposal Water	$/year	675,100	675,100	433,300	433,300	—	—	Incl. above	Incl. above	200,000	—	—	106,611	147,000	500,000	—	Muskogee - $1.35/1,000 gal, 1 year buy-back Sonner - $1.27/1,000 gal, 3 year buy-back White Bluff - $1.60/1,000 gal Ross Dam - $1.90/1,000 gal, $500,000/yr Kimberly - $1.60/1,000 gal Network Plant - $500,000/yr, 5 year buy-back
Value of Allowances	$/year	0	0	0	0	0	0	—	—	—	—	—	—	—	—	—	
Purchase Power	$/year	5,812,000	5,812,000	5,656,000	5,656,000	5,256,000	5,256,000	Incl. above	Incl. above	3,572,000	3,915,250	2,715,250	2,715,250	1,243,000	2,000,000	4,500,000	Muskogee - $45.00/MWh Sonner - $45.00/MWh Grand Gas Station - $45.00/MWh, includes energy charges and capacity charges White Bluff - $47.50/MWh Ross Dam - Net Generation Shortfall Cost - $45.00/MWh Kimberly - $45.00/MWh, 30-45 MW Network Plant - $45.00/MWh
Forced Outage Power Cost	$/year	0	0	0	0	348,000	348,000	0	0	0	0	0	0	0	0	0	Sonner - $50,000/MWh Grand Gas Station - $50,000/MWh Network Plant - $50,000/MWh
Indirect Costs	$/year	3,478,100	3,478,100	3,467,100	3,467,100	0	0	0	0	0	0	30,932,000	30,932,000	0	0	0	Muskogee - 0.97% of total capital investment Sonner - 0.97% of total capital investment Network Plant - 0% of total capital investment
Property Taxes	$/year	2,431,000	2,431,000	2,355,000	2,355,000	—	—	—	—	—	—	2,355,000	2,355,000	—	—	—	OG&E's - 0.85% of total capital investment Network Plant - 0% of total capital investment
Insurance	$/year	32,200	32,200	30,000	30,000	—	—	—	—	—	—	2,715,000	2,715,000	—	—	—	Network Plant - 0% of total capital investment
Administrative	$/year	852,300	852,300	802,700	802,700	—	—	—	—	—	—	3,867,000	3,867,000	—	—	—	OG&E - 2% of Cost of Sales Network Plant - 2% of total capital investment
Fixed Charge on Investment	$/year	31,874,000	31,874,000	30,111,000	30,111,000	30,980,000	31,012,000	31,844,000	31,844,000	29,244,000	29,244,000	27,840,000	27,840,000	10,268,000	23,456,000	56,190,000	
Annual Cost	$/year	76,140,000	76,140,000	66,822,000	66,822,000	59,136,000	59,136,000	65,195,000	65,195,000	58,181,000	58,181,000	81,374,000	81,374,000	33,111,000	39,471,000	92,000,000	