Sargent & Lundy LLC

Pro Forma Financial Model
NPPD Multi-Pollutant Removal Study

Summary of Results

Case	1	2	21	22	23	24
	Levelized Annual Revenue Requirement Over 20 Years					
Pollutant			Hg			
Equipment Option	Status Quo		ACI Injection		ACI Inj., 50% Landfill	
Unit	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2
Year For Start of Levelizing	2015	2015	2015	2015	2015	2015
Investment cost, level $1000s/yr	$0	$0	$451	$451	$451	$451
Purchased power (outage extension)	$0	$0	$0	$0	$0	$0
O&M, level $1000s						
SOX fixed	$0	$0	$0	$0	$0	$0
SOX variable	$0	$0	$0	$0	$0	$0
NOX fixed	$0	$0	$0	$0	$0	$0
NOX variable	$0	$0	$0	$0	$0	$0
Hg fixed	$0	$0	$71	$71	$71	$71
Hg variable	$0	$0	$2,729	$2,933	$2,729	$2,933
Particulate fixed	$0	$0	$0	$0	$0	$0
Particulate variable	$783	$787	$1,259	$1,269	$783	$787
Allowances purch. (+) / sold (-)						
SOX	$0	$0	$0	$0	$0	$0
Hg	$0	$0	$0	$0	$0	$0
Fuel, level $1000s	$0	$0	$0	$0	$0	$0
Total level $1000s	$783	$787	$4,510	$4,724	$4,035	$4,242
Change from status quo, level $1000s	Base	Base	$3,727	$3,937	$3,252	$3,455
% change from status quo			476%	500%	415%	439%
Total Removal Cost, Level $/MWh	$0.17	$0.16	$0.97	$0.96	$0.87	$0.86
			Removal $/oz. Hg.		Removal $/oz. Hg.	
			$58	**$57**	**$58**	**$57**
			$0	**$0**	**$0**	**$0**
			$9	**$9**	**$9**	**$9**
			$351	**$372**	**$351**	**$372**
			$419	**$439**	**$419**	**$439**

Nebraska Public Power District
Gerald Gentleman Station

Technical Input to Proforma and O&M Cost Estimate

Project No. 12681-006
10/14/2011

	1	2	21	22	23	24	1
	Status Quo Case	**Status Quo Case**	**ACI**	**ACI**	**ACI 50% Landfill**	**ACI 50% Landfill**	
SCENARIO:	**0.28% S, Unit 1**	**0.28% S, Unit 2**	**Unit 1**	**Unit 2**	**Unit 1**	**Unit 2**	2
	Unit 1	Unit 2	Unit 1	Unit 2	Unit 1	Unit 2	3
Pollutant System Which Sets First Year of Analysis	None	None	Hg	Hg	Hg	Hg	4
							5
Date Analysis Begins	2015	2015	2015	2015	2015	2015	6
							7
General							8
Gross Capacity (MW)	705	745	705	745	705	745	9
Net Capacity (MW)	665	700	665	700	665	700	10
Auxiliary Power (MW)	40	45	40	45	40	45	11
Net Plant Heat Rate (Btu/kWh)	10,448	10,067	10,448	10,067	10,448	10,067	12
URGE Heat Input to Boiler (mmBtu/hr)	6948.0	7047.0	6948.0	7047.0	6948.0	7047.0	13
Annual Heat Input to Boiler (mmBtu/yr)	60,864,480	61,731,720	60,864,480	61,731,720	60,864,480	61,731,720	14
Fuel sulfur percentage	0.28%	0.28%	1.00%	1.00%	1.00%	1.00%	15
Annual Capacity Factor	100%	100%	100%	100%	100%	100%	16
							17
							29
Hg Emission							30
Control Technology (Type)			ACI	ACI	ACI	ACI	31
Control Efficiency (%)			90%	90%	90%	90%	32
Include Hg allowance costs/inventories in the economics? (Y/N)	N	N	N	N	N	N	33
Uncontrolled Rate (lb/trillion Btu)			11.08	11.08	11.08	11.08	34
Controlled Rate (lb/trillion Btu)			1.11	1.11	1.11	1.11	35
Annual Emission (oz/yr)	10,434	10,583	1,079	1,094	1,079	1,094	36
Annual Removed (oz/yr)	0	0	9,710	9,848	9,710	9,848	37
Allowance Equivalent Available (oz/yr)	2,984	3,046	2984	3046	2984	3046	38
Allowances Equivalent Used (oz/yr)	10,434	10,583	1,079	1,094	1,079	1,094	39
Allowances Equivalent Sold (+)/Bought (-) (oz/yr)	(7,450)	(7,537)	1,905	1,952	1,905	1,952	40
							41
Capital costs							64
Hg Control, Direct Cost ($)			$2,909,000	$2,909,000	$2,909,000	$2,909,000	75
Hg Control, Indirect Cost ($)			$869,000	$869,000	$869,000	$869,000	76
Hg Control, Contingency Cost ($)			$290,900	$290,900	$290,900	$290,900	77
Additional weeks of outage for installation							78
Operational Commercial Operation Date (year)	2015	2015	2015	2015	2015	2015	79
Fixed O&M (First Year)							109
Annual Hg Control Maintenance, Material, and Labor ($)			10,000	10,000	10,000	10,000	112
Staff Needed for Mercury Control (#)			0.5	0.5	0.5	0.5	113
Annual Aux Power System Control Maintenance, Material, and Labor ($)							120
Staff Needed for Aux Power System (#)							121
							122
Consumables/Products							123
Limestone (tpy)	0	0					124
Lime (tpy)	0	0	0	0	0	0	125
Brominated Activated Carbon (tpy)	0	0	1,250	1,343	1,250	1,343	126
Urea (tpy)	0	0	0	0	0	0	127
Water (1000 gallons/yr) for SO2 system	0	0	0	0	0	0	128
Water (1000 gallons/yr) for NOX system	0	0	0	0	0	0	129
Power due to SO_2 Removal (MW)	0	0	0	0	0	0	130
Power due to Mercury Removal (MW)	0	0	0	0	0	0	131
Power due to NO_x Removal (MW)	0	0	0	0	0	0	132
Power from Particulate Control Equipment (MW)	0	0	0	0	0	0	133
Bags (not a function of capacity factor)	16474	16474	16474	16474	16474	16474	134
Bag Life (years)							135
Cages (not a function of capacity factor)							136
Fly Ash - Sold (tpy)	68,625	69,603	0	0	68,625	69,603	137
Fly Ash - Landfilled (tpy)	68,625	69,603	137,250	139,206	68,625	69,603	138
Availability Penalty (MW-hr/yr)			0	0	0	0	139
Catalyst m3 per year (not a function of capacity factor)			0	0	0	0	140
Solid Waste - Sold (tpy)			0	0	0	0	141
Solid Waste - Landfilled (tpy)			0	0	0	0	142
Gypsum - Sold (tpy)							143
Gypsum - Landfilled (tpy)							144
Heat Rate Degradation			0	0	0	0	145
Fuel Additive (gallons/yr)			0	0	0	0	146

Pro Forma Financial Model
NPPD Multi-Pollutant Removal Study
Economic Input Data

Sargent & Lundy LLC

Unit Currently Selected	Unit 2
Fuel Sulfur Content	1.00%

Economic Parameters

Interest rate for construction financing	0.00% (zero because now is in the capex estimate)
Interest rate for discounting	5.25%
Interest rate for permanent debt	5.25%
Owners' costs (adder to capital investment)	0.0% (zero because now is in the capex estimate)
Sales tax applied to materials costs	0.00% (zero because now is in the capex estimate)
Insurance, % of initial cost	0.000%
Property tax rate, %	0.00%
Escalation rate for capital costs	0.00% (zero because now is in the capex estimate)
Fuel cost escalation rate	2.50%
Maintenance cost escalation rate (labor + mat'l)	2.50%
Base year for escalation, except coal	2011
Base year for coal cost escalation	2011
Year Hg allowances are first required	

Schedule and Capacity Factor

Number of years in financial analysis	20
Final operating year in revenue req'l analysis	2035
Construction spending lead time for DFGD, months	16
Construction spending lead time for WFGD, months	16
Capacity factor, %	80%

Prices

	Units	Base Price	Esc., %/yr	
Limestone	$/ton	$26.00	2.50%	(updated cost)
Lime (90% available CaO)	$/ton	$95.00	2.50%	
Powdered activated carbon	$/ton	$1,000	2.50%	(updated cost)
Brominated activated carbon	$/ton	$2,000	2.50%	
Fuel additive	$/gallon	$17.50	2.50%	
Urea	$/ton	$400.00	2.50%	(updated cost)
Dibasic acid	$/ton	$0.00	2.50%	
Water	$/1000 gallons	$1.00	2.50%	
SO_2 reduction agent (Na_2CO_3)	$/ton	$0.00	2.50%	
Power: energy charge (outage extension)	$/MWh	$31.90	2.50%	
Power: energy charge (aux. power))	$/MWh	$45.65	2.50%	
Power: capacity charge	$/kW/year	$46.00	2.50%	
Catalyst	$/cubic meter	$7,000	2.50%	
Bags	$/bag	$157	2.50%	
Bag change-out frequency, WFGD	years between changes	7		
Bag change-out frequency, DFGD	years between changes	5		
Cages	$/bag	$0	2.50%	
Cage change-out frequency, WFGD	years between changes	7		
Cage change-out frequency, DFGD	years between changes	5		
Bag change-out labor	$/bag	$15		(esc. like bag cost)
Flyash sell price	$/ton	$1.35	2.50%	
Flyash landfill cost	$/ton	$5.00	2.50%	
Solid waste sell price	$/ton	$0.00	2.50%	
Solid waste landfill cost	$/ton	$5.00	2.50%	**(run sensitivities at $5/ton too)**
Gypsum sell price	$/ton	$0.00	2.50%	
Gypsum landfill cost	$/ton	$5.00	2.50%	
NOX allowance cost	$/ton	$0.00	2.50%	
Staff cost per man-hour today	$/man-hour	$40.60	2.50%	
Frequency of boiler upgrade spending	years between spending	0	2.50%	

Emissions Prior To Installation of Pollution Control Equipment

		Unit 1, 1.00%S	Unit 2, 1.00%S	Unit 1, 0.70%S	Unit 2, 0.70%S	Unit 1, 0.25%S	Unit 2, 0.28%S	
Flyash sales	tpy	69,767	70,761	70,833	71,842	68,625	69,603	2
Flyash landfill quantity	tpy	69,767	70,761	70,833	71,842	68,625	69,603	3
SOX emissions, uncontrolled	tpy	68,960	69,943	53,193	53,951	20,288	20,577	4
NOX emissions, uncontrolled	tpy	6,999	7,099	6,999	7,099	6,999	7,099	5
Hg emissions, uncontrolled	oz./year	9,936	10,072	10,748	10,942	10,434	10,583	6

Allowances

	SOX (tons)		Hg (oz.)	
Year	tons / unit	factor	oz. / unit	factor
2005	16,600	1.00	0	1.0000
2009	16,600	1.00	0	1.0000
2010	14,977	1.00	0	1.0000
2015	14,977	1.00	0	1.0000
2018	14,977	1.00	0	1.0000
	1	2	3	4	5

Question 1

Pro Forma Financial Model
NPPD Multi-Pollutant Removal Study
Revenue Requirement Determination

Sargent & Lundy LLC

Case 2: Status Quo Case 0.28% S, Unit 2

	NPV RR	Levelized	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Analysis Year			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Calendar Year			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Discount factor			0.9501	0.9027	0.8577	0.8149	0.7743	0.7356	0.6989	0.6641	0.6310	0.5995	0.5696	0.5412	0.5142	0.4885	0.4642	0.4410	0.4190	0.3981	0.3783	0.3594
Capacity factor			80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%
Energy production, GWh (with NPV)	61,534		4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906
Available SOX allowances, tons			14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977
SOX allowance surrender rate			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Equivalent available SOX allowances, tons			14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977
Equivalent SOX allowances used, tons (i.e., emissions)			(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)	(13,993)
Equivalent SOX allowances sold(+)/bought(-)			984	984	984	984	984	984	984	984	984	984	984	984	984	984	984	984	984	984	984	984
Tons SOX removed			2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469	2,469
Available Hg allowances, oz.			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg allowance surrender rate			1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Equivalent available Hg allowances, oz.			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg allowances used, oz. (i.e., emissions)			(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)	(8,466)
Hg allowances sold(+)/bought(-)			(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)	(8,465)
Ounces Hg removed			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tons NOX removed			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tons particulates removed			111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364	111,364
SOX allowance cost, $/ton (escalated values)			$265	$282	$299	$317	$333	$351	$368	$387	$407	$428	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450
Hg allowance cost, $/oz (escalated values)			$1,507	$1,589	$1,674	$1,764	$1,872	$1,987	$2,109	$2,238	$2,375	$2,521	$2,675	$2,840	$3,014	$3,198	$3,395	$3,603	$3,824	$4,058	$4,307	$4,571
Control system operating period masks																						
SOX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Hg			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NOX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Particulates			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Fixed charge rates																						
SOX			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Hg			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
NOX			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Particulates			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Total																						
Fixed charges on investment, $1000s	**NPV RR**	**Levelized**																				
SOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hg	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Particulates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Extended outage purch power, $1000s																						
SOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hg	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Particulates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed O&M expense, $1000s																						
For SOX control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For Hg control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For NOX control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total fixed O&M cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M expense, $1000s																						
For SOX control:																						
Limestone	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Lime (90% available CaO)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Dibasic acid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water for SOX removal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SO_3 reduction agent (Na_2CO_3)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Solid waste sales revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Solid waste landfill cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gypsum sales revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gypsum landfill cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For Hg control:																						
Powdered activated carbon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Brominated activated carbon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fuel additive	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For NOX control:																						
Urea	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Catalyst	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water for NOX removal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For particulate control:																						
Bags	$8,392	$510	$0	$0	$0	$0	$0	$0	$3,627	$0	$0	$0	$0	$0	$0	$4,312	$0	$0	$0	$0	$0	$0
Cages	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Flyash sales	($1,287)	($103)	($83)	($85)	($87)	($89)	($92)	($94)	($96)	($99)	($101)	($104)	($106)	($109)	($112)	($114)	($117)	($120)	($123)	($126)	($129)	($133)
Flyash landfill cost	$4,766	$380	$307	$315	$323	$331	$339	$348	$356	$365	$374	$384	$392	$403	$413	$424	$434	$445	$456	$466	$479	$491
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total variable O&M cost	$9,871	$787	$224	$230	$236	$242	$248	$254	$3,887	$267	$273	$280	$287	$294	$302	$4,621	$317	$325	$333	$341	$350	$359
Fuel expense, $1000	$0	$0																				
Total revenue requirement, $1000s	$9,871	$787	$224	$230	$236	$242	$248	$254	$3,887	$267	$273	$280	$287	$294	$302	$4,621	$317	$325	$333	$341	$350	$359
Summary Revenue Requirements	**NPV RR**	**Levelized**																				
Investment cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Extended outage purchased power	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M w/o allowances or aux. pwr.	$9,871	$787	$224	$230	$236	$242	$248	$254	$3,887	$267	$273	$280	$287	$294	$302	$4,621	$317	$325	$333	$341	$350	$359
Auxiliary power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Auxiliary power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$9,871	$787	$224	$230	$236	$242	$248	$254	$3,887	$267	$273	$280	$287	$294	$302	$4,621	$317	$325	$333	$341	$350	$359

NPPDRH114_0006503

ED_005798_00000584-00004

Question 1

Pro Forma Financial Model
NPPD Multi-Pollutant Removal Study
Revenue Requirement Determination

Sargent & Lundy LLC

Case 1: Status Quo Case 0.28% S, Unit 1

Analysis Year	NPV RR	Levelized	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Calendar Year			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Discount factor			0.9501	0.9027	0.8577	0.8149	0.7743	0.7356	0.6989	0.6641	0.6310	0.5996	0.5696	0.5412	0.5142	0.4885	0.4642	0.4410	0.4190	0.3981	0.3783	0.3594
Capacity factor			80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%
Energy production, GWh (with NPV)		58,458	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660
Available SOX allowances, tons			14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977
SOX allowance surrender rate			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Equivalent available SOX allowances, tons			14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977
Equivalent SOX allowances used, tons (i.e., emissions)			(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)	(13,796)
Equivalent SOX allowances sold(+)/bought(-)			1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181	1,181
Tons SOX removed			2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435	2,435
Available Hg allowances, oz.			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg allowance surrender rate			1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Equivalent available Hg allowances, oz.			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg allowances used, oz. (i.e., emissions)			(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)	(8,347)
Hg allowances sold(+)/bought(-)			(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)	(8,346)
Ounces Hg removed			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tons NOX removed			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tons particulates removed			109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800
SOX allowance cost, $/ton (escalated values)			$265	$282	$299	$317	$333	$351	$368	$387	$407	$428	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450
Hg allowance cost, $/oz (escalated values)			$1,507	$1,589	$1,674	$1,764	$1,872	$1,997	$2,109	$2,236	$2,376	$2,521	$2,675	$2,840	$3,014	$3,198	$3,395	$3,603	$3,824	$4,058	$4,307	$4,571
Control system operating period masks																						
SOX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Hg			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NOX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Particulates			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Fixed charge rates																						
SOX			10.25%	9.99%	9.73%	9.46%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Hg			10.25%	9.99%	9.73%	9.46%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
NOX			10.25%	9.99%	9.73%	9.46%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Particulates			10.25%	9.99%	9.73%	9.46%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Total																						
Fixed charges on investment, $1000s	**NPV RR**	**Levelized**																				
SOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hg	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Particulates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Extended outage purch power, $1000s																						
SOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hg	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Particulates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed O&M expense, $1000s																						
For SOX control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For Hg control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For NOX control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total fixed O&M cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M expense, $1000s																						
For SOX control:																						
Limestone	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Lime (90% available CaO)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Dibasic acid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water for SOX removal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SO_3 reduction agent (Na_2CO_3)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Solid waste sales revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Solid waste landfill cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gypsum sales revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gypsum landfill cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For Hg control:																						
Powdered activated carbon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Brominated activated carbon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fuel additive	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For NOX control:																						
Urea	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Catalyst	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water for NOX removal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For particulate control:																						
Bags	$6,392	$510	$0	$0	$0	$0	$0	$0	$3,627	$0	$0	$0	$0	$0	$0	$4,312	$0	$0	$0	$0	$0	$0
Cages	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Flyash sales	($1,269)	($101)	($82)	($84)	($86)	($88)	($90)	($93)	($95)	($97)	($100)	($102)	($105)	($107)	($110)	($113)	($116)	($118)	($121)	($124)	($128)	($131)
Flyash landfill cost	$4,699	$375	$303	$311	$318	$326	$334	$343	$351	$360	$369	$378	$388	$398	$407	$418	$428	$439	$450	$461	$473	$484
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total variable O&M cost	$9,822	$783	$221	$227	$232	$238	$244	$250	$3,884	$263	$269	$276	$283	$290	$297	$4,616	$313	$320	$328	$337	$345	$354
Fuel expense, $1000	$0	$0																				
Total revenue requirement, $1000s	$9,822	$783	$221	$227	$232	$238	$244	$250	$3,884	$263	$269	$276	$283	$290	$297	$4,616	$313	$320	$328	$337	$345	$354
Summary Revenue Requirements	**NPV RR**	**Levelized**																				
Investment cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Extended outage purchased power	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed O&M	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Variable O&M w/o allowances or aux. pwr.	$9,822	$783	$221	$227	$232	$238	$244	$250	$3,884	$263	$269	$276	$283	$290	$297	$4,616	$313	$320	$328	$337	$345	$354
Auxiliary power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Auxiliary power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$9,822	$783	$221	$227	$232	$238	$244	$250	$3,884	$263	$269	$276	$283	$290	$297	$4,616	$313	$320	$328	$337	$345	$354

NPPDRH114_0006504

ED_005798_00000584-00005

Question 1

Pro Forma Financial Model
NPPD Multi-Pollutant Removal Study
Revenue Requirement Determination

Sargent & Lundy LLC

Case 21: ACI
Unit 1

	NPV RR	Levelized	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Analysis Year			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Calendar Year			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Discount factor			0.9501	0.9027	0.8577	0.8149	0.7743	0.7356	0.6989	0.6641	0.6310	0.5996	0.5696	0.5412	0.5142	0.4885	0.4642	0.4410	0.4190	0.3981	0.3783	0.3594
Capacity factor			80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%
Energy production, GWh (with NPV) 1	58,458		4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660
Available SOX allowances, tons			14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977
SOX allowance surrender rate			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Equivalent available SOX allowances, tons			14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977
Equivalent SOX allowances used, tons (i.e., emissions)			(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)
Equivalent SOX allowances sold(+)/bought(-)			(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)
Tons SOX removed			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Available Hg allowances, oz.			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg allowance surrender rate			1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Equivalent available Hg allowances, oz.			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg allowances used, oz. (i.e., emissions)			(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)
Hg allowances sold(+)/bought(-)			(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)
Ounces Hg removed			7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768
Tons NOX removed			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tons particulates removed			109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800
SOX allowance cost, $/ton (escalated values)			$265	$282	$299	$317	$333	$351	$368	$387	$407	$428	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450
Hg allowance cost, $/oz (escalated values)			$1,507	$1,589	$1,674	$1,764	$1,872	$1,987	$2,109	$2,238	$2,375	$2,521	$2,675	$2,840	$3,014	$3,198	$3,395	$3,603	$3,824	$4,058	$4,307	$4,571
Control system operating period masks																						
SOX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Hg			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NOX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Particulates			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Fixed charge rates																						
SOX			10.25%	9.99%	9.73%	9.46%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Hg			10.25%	9.99%	9.73%	9.46%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
NOX			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Particulates			10.25%	9.99%	9.73%	9.46%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Total																						
Fixed charges on investment, $1000s	**NPV RR**	**Levelized**																				
SOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hg	$5,655	$451	$580	$565	$550	$535	$520	$505	$491	$476	$461	$446	$431	$416	$402	$387	$372	$357	$342	$327	$312	$298
NOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Particulates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	**$5,655**	**$451**	**$580**	**$565**	**$550**	**$535**	**$520**	**$505**	**$491**	**$476**	**$461**	**$446**	**$431**	**$416**	**$402**	**$387**	**$372**	**$357**	**$342**	**$327**	**$312**	**$298**
Extended outage purch power, $1000s																						
SOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hg	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Particulates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed O&M expense, $1000s																						
For SOX control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For Hg control:																						
Maintenance (labor + mat'l)	$171	$14	$11	$11	$12	$12	$12	$13	$13	$13	$13	$14	$14	$14	$15	$15	$16	$16	$16	$17	$17	$18
Operating labor	$723	$58	$47	$48	$49	$50	$51	$53	$54	$55	$57	$58	$60	$61	$63	$64	$66	$68	$69	$71	$73	$75
For NOX control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total fixed O&M cost	**$894**	**$71**	**$58**	**$59**	**$61**	**$62**	**$64**	**$65**	**$67**	**$69**	**$70**	**$72**	**$74**	**$76**	**$78**	**$79**	**$81**	**$83**	**$86**	**$88**	**$90**	**$92**
Variable O&M expense, $1000s																						
For SOX control:																						
Limestone	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Lime (90% available CaO)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Dibasic acid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water for SOX removal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SO_3 reduction agent (Na_2CO_3)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Solid waste sales revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Solid waste landfill cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gypsum sales revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gypsum landfill cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For Hg control:																						
Powdered activated carbon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Brominated activated carbon	$34,238	$2,729	$2,208	$2,263	$2,318	$2,377	$2,437	$2,498	$2,560	$2,624	$2,690	$2,757	$2,826	$2,897	$2,968	$3,043	$3,119	$3,197	$3,277	$3,359	$3,443	$3,529
Fuel additive	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For NOX control:																						
Urea	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Catalyst	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water for NOX removal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For particulate control:																						
Bags	$6,392	$510	$0	$0	$0	$0	$0	$0	$3,627	$0	$0	$0	$0	$0	$0	$4,312	$0	$0	$0	$0	$0	$0
Cages	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Flyash sales	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Flyash landfill cost	$9,398	$749	$606	$621	$637	$653	$669	$686	$703	$720	$738	$757	$776	$795	$815	$835	$856	$878	$900	$922	$945	$969
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total variable O&M cost	**$50,028**	**$3,988**	**$2,814**	**$2,884**	**$2,956**	**$3,030**	**$3,106**	**$3,183**	**$6,890**	**$3,345**	**$3,428**	**$3,514**	**$3,602**	**$3,692**	**$3,784**	**$8,160**	**$3,976**	**$4,075**	**$4,177**	**$4,281**	**$4,388**	**$4,498**
Fuel expense, $1000	$0	$0																				
Total revenue requirement, $1000s	**$56,577**	**$4,510**	**$3,451**	**$3,508**	**$3,567**	**$3,627**	**$3,690**	**$3,754**	**$7,448**	**$3,889**	**$3,959**	**$4,032**	**$4,107**	**$4,184**	**$4,263**	**$8,656**	**$4,429**	**$4,515**	**$4,605**	**$4,696**	**$4,791**	**$4,888**
Summary Revenue Requirements	**NPV RR**	**Levelized**																				
Investment cost	$5,655	$451	$580	$565	$550	$535	$520	$505	$491	$476	$461	$446	$431	$416	$402	$387	$372	$357	$342	$327	$312	$298
Extended outage purchased power	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed O&M	$894	$71	$58	$59	$61	$62	$64	$65	$67	$69	$70	$72	$74	$76	$78	$79	$81	$83	$86	$88	$90	$92
Variable O&M w/o allowances or aux. pwr.	$50,028	$3,988	$2,814	$2,884	$2,956	$3,030	$3,106	$3,183	$6,890	$3,345	$3,428	$3,514	$3,602	$3,692	$3,784	$8,160	$3,976	$4,075	$4,177	$4,281	$4,388	$4,498
Auxiliary power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Auxiliary power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$56,577	$4,510	$3,451	$3,508	$3,567	$3,627	$3,690	$3,754	$7,448	$3,889	$3,959	$4,032	$4,107	$4,184	$4,263	$8,656	$4,429	$4,515	$4,605	$4,696	$4,791	$4,888

Question 1

Pro Forma Financial Model
NPPD Multi-Pollutant Removal Study
Revenue Requirement Determination

Sargent & Lundy LLC

Case 22: ACI
Unit 2

	NPV RR	Levelized																				
Analysis Year			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Calendar Year			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Discount factor			0.9501	0.9027	0.8577	0.8149	0.7743	0.7356	0.6989	0.6641	0.6310	0.5996	0.5696	0.5412	0.5142	0.4885	0.4642	0.4410	0.4190	0.3981	0.3783	0.3594
Capacity factor			80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%
Energy production, GWh (with NPV)	1	61,534	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906
Available SOX allowances, tons			14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977
SOX allowance surrender rate			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Equivalent available SOX allowances, tons			14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977
Equivalent SOX allowances used, tons (i.e., emissions)			(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)
Equivalent SOX allowances sold(+)/bought(-)			(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)
Tons SOX removed			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Available Hg allowances, oz.			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg allowance surrender rate			1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Equivalent available Hg allowances, oz.			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg allowances used, oz. (i.e., emissions)			(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)
Hg allowances sold(+)/bought(-)			(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)
Ounces Hg removed			7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878
Tons NOX removed			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tons particulates removed			111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365
SOX allowance cost, $/ton (escalated values)			$265	$282	$299	$317	$333	$351	$368	$387	$407	$428	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450
Hg allowance cost, $/oz (escalated values)			$1,507	$1,589	$1,674	$1,764	$1,872	$1,987	$2,109	$2,238	$2,376	$2,521	$2,675	$2,840	$3,014	$3,198	$3,395	$3,603	$3,824	$4,058	$4,307	$4,571
Control system operating period masks																						
SOX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Hg			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NOX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Particulates			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Fixed charge rates																						
SOX			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Hg			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
NOX			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Particulates			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Total																						
Fixed charges on investment, $1000s	**NPV RR**	**Levelized**																				
SOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hg	$5,655	$451	$580	$565	$550	$535	$520	$505	$491	$476	$461	$446	$431	$416	$402	$387	$372	$357	$342	$327	$312	$298
NOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Particulates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$5,655	$451	$580	$565	$550	$535	$520	$505	$491	$476	$461	$446	$431	$416	$402	$387	$372	$357	$342	$327	$312	$298
Extended outage purch power, $1000s																						
SOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hg	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Particulates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed O&M expense, $1000s																						
For SOX control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For Hg control:																						
Maintenance (labor + mat'l)	$171	$14	$11	$11	$12	$12	$12	$12	$13	$13	$13	$14	$14	$14	$15	$15	$16	$16	$16	$17	$17	$18
Operating labor	$723	$58	$47	$48	$49	$50	$51	$53	$54	$55	$57	$58	$60	$61	$63	$64	$66	$68	$69	$71	$73	$75
For NOX control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total fixed O&M cost	$894	$71	$58	$59	$61	$62	$64	$65	$67	$69	$70	$72	$74	$76	$78	$79	$81	$83	$86	$88	$90	$92
Variable O&M expense, $1000s																						
For SOX control:																						
Limestone	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Lime (90% available CaO)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Dibasic acid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water for SOX removal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SO_3 reduction agent (Na_2CO_3)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Solid waste sales revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Solid waste landfill cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gypsum sales revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gypsum landfill cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For Hg control:																						
Powdered activated carbon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Brominated activated carbon	$36,785	$2,933	$2,372	$2,431	$2,492	$2,554	$2,618	$2,684	$2,751	$2,819	$2,890	$2,962	$3,036	$3,112	$3,190	$3,270	$3,351	$3,435	$3,521	$3,609	$3,699	$3,792
Fuel additive	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For NOX control:																						
Urea	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Catalyst	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water for NOX removal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For particulate control:																						
Bags	$6,392	$510	$0	$0	$0	$0	$0	$0	$3,627	$0	$0	$0	$0	$0	$0	$4,312	$0	$0	$0	$0	$0	$0
Cages	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Flyash sales	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Flyash landfill cost	$9,532	$760	$615	$630	$646	$662	$678	$695	$713	$731	$749	$768	$787	$806	$827	$847	$868	$890	$912	$935	$959	$983
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total variable O&M cost	$52,709	$4,202	$2,987	$3,061	$3,138	$3,216	$3,297	$3,379	$7,091	$3,550	$3,639	$3,730	$3,823	$3,919	$4,017	$8,428	$4,220	$4,325	$4,433	$4,544	$4,658	$4,774
Fuel expense, $1000	$0	$0																				
Total revenue requirement, $1000s	$59,258	$4,724	$3,624	$3,685	$3,748	$3,813	$3,880	$3,950	$7,648	$4,094	$4,170	$4,248	$4,328	$4,411	$4,496	$8,895	$4,673	$4,766	$4,861	$4,959	$5,060	$5,164
Summary Revenue Requirements	**NPV RR**	**Levelized**																				
Investment cost	$5,655	$451	$580	$565	$550	$535	$520	$505	$491	$476	$461	$446	$431	$416	$402	$387	$372	$357	$342	$327	$312	$298
Extended outage purchased power	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed O&M	$894	$71	$58	$59	$61	$62	$64	$65	$67	$69	$70	$72	$74	$76	$78	$79	$81	$83	$86	$88	$90	$92
Variable O&M w/o allowances or aux. pwr.	$52,709	$4,202	$2,987	$3,061	$3,138	$3,216	$3,297	$3,379	$7,091	$3,550	$3,639	$3,730	$3,823	$3,919	$4,017	$8,428	$4,220	$4,325	$4,433	$4,544	$4,658	$4,774
Auxiliary power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Auxiliary power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$59,258	$4,724	$3,624	$3,685	$3,748	$3,813	$3,880	$3,950	$7,648	$4,094	$4,170	$4,248	$4,328	$4,411	$4,496	$8,895	$4,673	$4,766	$4,861	$4,959	$5,060	$5,164

NPPDRH114_0006506

ED_005798_00000584-00007

Question 1

Pro Forma Financial Model
NPPD Multi-Pollutant Removal Study
Revenue Requirement Determination

Sargent & Lundy LLC

Case 23: ACI 50% Landfill
Unit 1

Analysis Year			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Calendar Year			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Discount factor			0.9501	0.9027	0.8577	0.8149	0.7743	0.7356	0.6989	0.6641	0.6310	0.5995	0.5696	0.5412	0.5142	0.4885	0.4642	0.4410	0.4190	0.3981	0.3783	0.3594
Capacity factor			80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%
Energy production, GWh (with NPV)	58,458		4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660	4,660
Available SOX allowances, tons			14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977
SOX allowance surrender rate			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Equivalent available SOX allowances, tons			14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977
Equivalent SOX allowances used, tons (i.e., emissions)			(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)	(55,168)
Equivalent SOX allowances sold(+)/bought(-)			(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)	(40,191)
Tons SOX removed			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Available Hg allowances, oz.			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg allowance surrender rate			1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Equivalent available Hg allowances, oz.			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg allowances used, oz. (i.e., emissions)			(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)	(863)
Hg allowances sold(+)/bought(-)			(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)	(862)
Ounces Hg removed			7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768	7,768
Tons NOX removed			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tons particulates removed			109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800	109,800
SOX allowance cost, $/ton (escalated values)			$265	$282	$299	$317	$333	$351	$368	$387	$407	$428	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450
Hg allowance cost, $/oz.(escalated values)			$1,507	$1,589	$1,674	$1,764	$1,872	$1,987	$2,109	$2,238	$2,376	$2,521	$2,676	$2,840	$3,014	$3,198	$3,395	$3,603	$3,824	$4,058	$4,307	$4,571
Control system operating period masks																						
SOX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Hg			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NOX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Particulates			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Fixed charge rates																						
SOX			10.25%	9.99%	9.73%	9.46%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Hg			10.25%	9.99%	9.73%	9.46%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
NOX			10.25%	9.99%	9.73%	9.46%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Particulates			10.25%	9.99%	9.73%	9.46%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Total																						
Fixed charges on investment, $1000s	**NPV RR**	**Levelized**																				
SOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hg	$5,655	$451	$580	$565	$550	$535	$520	$505	$491	$476	$461	$446	$431	$416	$402	$387	$372	$357	$342	$327	$312	$298
NOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Particulates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$5,655	$451	$580	$565	$550	$535	$520	$505	$491	$476	$461	$446	$431	$416	$402	$387	$372	$357	$342	$327	$312	$298
Extended outage purch power, $1000s																						
SOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hg	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Particulates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed O&M expense, $1000s																						
For SOX control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For Hg control:																						
Maintenance (labor + mat'l)	$171	$14	$11	$11	$12	$12	$12	$13	$13	$13	$13	$14	$14	$14	$15	$16	$16	$16	$16	$17	$17	$18
Operating labor	$723	$58	$47	$48	$49	$50	$51	$53	$54	$55	$57	$58	$60	$61	$63	$64	$66	$68	$69	$71	$73	$75
For NOX control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total fixed O&M cost	$894	$71	$58	$59	$61	$62	$64	$65	$67	$69	$70	$72	$74	$76	$78	$79	$81	$83	$86	$88	$90	$92
Variable O&M expense, $1000s																						
For SOX control:																						
Limestone	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Lime (90% available CaO)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Dibasic acid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water for SOX removal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SO_3 reduction agent (Na_2CO_3)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Solid waste sales revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Solid waste landfill cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gypsum sales revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gypsum landfill cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For Hg control:																						
Powdered activated carbon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Brominated activated carbon	$34,238	$2,729	$2,208	$2,263	$2,318	$2,377	$2,437	$2,498	$2,560	$2,624	$2,690	$2,757	$2,826	$2,897	$2,968	$3,043	$3,119	$3,197	$3,277	$3,359	$3,443	$3,529
Fuel additive	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For NOX control:																						
Urea	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Catalyst	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water for NOX removal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For particulate control:																						
Bags	$8,392	$510	$0	$0	$0	$0	$0	$0	$3,627	$0	$0	$0	$0	$0	$0	$4,312	$0	$0	$0	$0	$0	$0
Cages	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Flyash sales	($1,269)	($101)	($82)	($84)	($86)	($88)	($90)	($93)	($95)	($97)	($100)	($102)	($105)	($107)	($110)	($113)	($116)	($118)	($121)	($124)	($128)	($131)
Flyash landfill cost	$4,699	$375	$303	$311	$318	$326	$334	$343	$351	$360	$369	$378	$388	$398	$407	$418	$428	$439	$450	$461	$473	$484
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total variable O&M cost	$44,060	$3,513	$2,429	$2,490	$2,552	$2,616	$2,681	$2,748	$6,444	$2,887	$2,959	$3,033	$3,109	$3,187	$3,266	$7,660	$3,432	$3,518	$3,606	$3,696	$3,788	$3,883
Fuel expense, $1000	$0	$0																				
Total revenue requirement, $1000s	$50,609	$4,035	$3,066	$3,113	$3,162	$3,213	$3,265	$3,319	$7,001	$3,431	$3,490	$3,551	$3,614	$3,679	$3,746	$8,126	$3,885	$3,958	$4,033	$4,111	$4,190	$4,273
Summary Revenue Requirements	**NPV RR**	**Levelized**																				
Investment cost	$5,655	$451	$580	$565	$550	$535	$520	$505	$491	$476	$461	$446	$431	$416	$402	$387	$372	$357	$342	$327	$312	$298
Extended outage purchased power	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed O&M	$894	$71	$58	$59	$61	$62	$64	$65	$67	$69	$70	$72	$74	$76	$78	$79	$81	$83	$86	$88	$90	$92
Variable O&M w/o allowances or aux. pwr.	$44,060	$3,513	$2,429	$2,490	$2,552	$2,616	$2,681	$2,748	$6,444	$2,887	$2,959	$3,033	$3,109	$3,187	$3,266	$7,660	$3,432	$3,518	$3,606	$3,696	$3,788	$3,883
Auxiliary power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Auxiliary power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$50,609	$4,035	$3,066	$3,113	$3,162	$3,213	$3,265	$3,319	$7,001	$3,431	$3,490	$3,551	$3,614	$3,679	$3,746	$8,126	$3,885	$3,958	$4,033	$4,111	$4,190	$4,273

NPPDRH114_0006507

ED_005798_00000584-00008

Question 1

Pro Forma Financial Model
NPPD Multi-Pollutant Removal Study
Revenue Requirement Determination

Sargent & Lundy LLC

Case 24: ACI 50% Landfill
Unit 2

	NPV RR	Levelized	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Analysis Year			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Calendar Year			2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034
Discount factor			0.9501	0.9027	0.8577	0.8149	0.7743	0.7356	0.6989	0.6641	0.6310	0.5995	0.5696	0.5412	0.5142	0.4885	0.4642	0.4410	0.4190	0.3981	0.3783	0.3594
Capacity factor			80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%	80.00%
Energy production, GWh (with NPV)		61,534	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906	4,906
Available SOX allowances, tons			14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977
SOX allowance surrender rate			1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Equivalent available SOX allowances, tons			14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977	14,977
Equivalent SOX allowances used, tons (i.e., emissions)			(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)	(55,954)
Equivalent SOX allowances sold(+)/bought(-)			(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)	(40,977)
Tons SOX removed			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Available Hg allowances, oz.			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg allowance surrender rate			1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Equivalent available Hg allowances, oz.			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hg allowances used, oz. (i.e., emissions)			(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)	(875)
Hg allowances sold(+)/bought(-)			(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)	(874)
Ounces Hg removed			7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878	7,878
Tons NOX removed			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tons particulates removed			111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365	111,365
SOX allowance cost, $/ton (escalated values)			$265	$282	$299	$317	$333	$351	$368	$387	$407	$428	$450	$450	$450	$450	$450	$450	$450	$450	$450	$450
Hg allowance cost, $/oz (escalated values)			$1,507	$1,589	$1,674	$1,764	$1,872	$1,987	$2,109	$2,238	$2,376	$2,521	$2,676	$2,840	$3,014	$3,198	$3,395	$3,603	$3,824	$4,058	$4,307	$4,571
Control system operating period masks																						
SOX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Hg			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NOX			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Particulates			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Fixed charge rates																						
SOX			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Hg			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
NOX			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Particulates			10.25%	9.99%	9.73%	9.48%	9.20%	8.94%	8.68%	8.41%	8.15%	7.89%	7.63%	7.36%	7.10%	6.84%	6.58%	6.31%	6.05%	5.79%	5.53%	5.26%
Total																						
Fixed charges on investment, $1000s	**NPV RR**	**Levelized**																				
SOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hg	$5,655	$451	$580	$565	$550	$535	$520	$505	$491	$476	$461	$446	$431	$416	$402	$387	$372	$357	$342	$327	$312	$298
NOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Particulates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$5,655	$451	$580	$565	$550	$535	$520	$505	$491	$476	$461	$446	$431	$416	$402	$387	$372	$357	$342	$327	$312	$298
Extended outage purch power, $1000s																						
SOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Hg	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
NOX	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Particulates	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed O&M expense, $1000s																						
For SOX control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For Hg control:																						
Maintenance (labor + mat'l)	$171	$14	$11	$11	$12	$12	$12	$12	$13	$13	$13	$14	$14	$14	$15	$15	$16	$16	$16	$17	$17	$18
Operating labor	$723	$58	$47	$48	$49	$50	$51	$53	$54	$55	$57	$58	$60	$61	$63	$64	$66	$68	$69	$71	$73	$75
For NOX control:																						
Maintenance (labor + mat'l)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Operating labor	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total fixed O&M cost	$894	$71	$58	$59	$61	$62	$64	$65	$67	$69	$70	$72	$74	$76	$78	$79	$81	$83	$86	$88	$90	$92
Variable O&M expense, $1000s																						
For SOX control:																						
Limestone	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Lime (90% available CaO)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Dibasic acid	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water for SOX removal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
SO_3 reduction agent (Na_2CO_3)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Solid waste sales revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Solid waste landfill cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gypsum sales revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Gypsum landfill cost	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For Hg control:																						
Powdered activated carbon	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Brominated activated carbon	$36,785	$2,933	$2,372	$2,431	$2,492	$2,554	$2,618	$2,684	$2,751	$2,819	$2,890	$2,962	$3,036	$3,112	$3,190	$3,270	$3,351	$3,435	$3,521	$3,609	$3,699	$3,792
Fuel additive	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For NOX control:																						
Urea	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Catalyst	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water for NOX removal	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Purchases (+) or sales (-) of allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
For particulate control:																						
Bags	$6,392	$510	$0	$0	$0	$0	$0	$0	$3,627	$0	$0	$0	$0	$0	$0	$4,312	$0	$0	$0	$0	$0	$0
Cages	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Flyash sales	($1,297)	($103)	($83)	($85)	($87)	($89)	($92)	($94)	($96)	($99)	($101)	($104)	($106)	($109)	($112)	($114)	($117)	($120)	($123)	($126)	($129)	($133)
Flyash landfill cost	$4,706	$380	$307	$315	$323	$331	$339	$348	$356	$365	$374	$384	$393	$403	$413	$424	$434	$445	$456	$468	$479	$491
Aux. power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Aux. power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total variable O&M cost	$46,656	$3,719	$2,596	$2,661	$2,728	$2,796	$2,866	$2,937	$6,638	$3,086	$3,163	$3,242	$3,323	$3,406	$3,492	$7,890	$3,668	$3,760	$3,854	$3,950	$4,049	$4,150
Fuel expense, $1000	$0	$0																				
Total revenue requirement, $1000s	$53,205	$4,242	$3,234	$3,285	$3,338	$3,393	$3,450	$3,508	$7,195	$3,630	$3,694	$3,760	$3,828	$3,898	$3,971	$8,357	$4,122	$4,201	$4,282	$4,365	$4,452	$4,540
Summary Revenue Requirements	**NPV RR**	**Levelized**																				
Investment cost	$5,655	$451	$580	$565	$550	$535	$520	$505	$491	$476	$461	$446	$431	$416	$402	$387	$372	$357	$342	$327	$312	$298
Extended outage purchased power	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fixed O&M	$894	$71	$58	$59	$61	$62	$64	$65	$67	$69	$70	$72	$74	$76	$78	$79	$81	$83	$86	$88	$90	$92
Variable O&M w/o allowances or aux. pwr.	$46,656	$3,719	$2,596	$2,661	$2,728	$2,796	$2,866	$2,937	$6,638	$3,086	$3,163	$3,242	$3,323	$3,406	$3,492	$7,890	$3,668	$3,760	$3,854	$3,950	$4,049	$4,150
Auxiliary power, energy charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Auxiliary power, capacity charge	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Allowances	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Fuel	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total	$53,205	$4,242	$3,234	$3,285	$3,338	$3,393	$3,450	$3,508	$7,195	$3,630	$3,694	$3,760	$3,828	$3,898	$3,971	$8,357	$4,122	$4,201	$4,282	$4,365	$4,452	$4,540

NPPDRH114_0006508

ED_005798_00000584-00009