Appendix 6

DETAILED EMISSIONS CALCULATIONS

Nevada Power
Boiler Emissions: Criteria Pollutant Potential To Emit

	Unit 1	Unit 2	Unit 3	Unit 4	Information Source
Nominal Net Unit Output (MW)	110	110	110	295	Nevada Power
Coal Feed Rate (tons/hr)	67.5	67.5	68.7	181.1	Nevada Power
Coal Percent Sulfur (%)	0.540	0.540	0.540	0.540	Nevada Power
Coal Ash Content (%)	16.00	16.00	16.00	16.00	Nevada Power
Heat Input to Boiler (MMBtu/hr)	1,215	1,215	1,237	2,956	Nevada Power
Fuel Heat Value (Btu/lb)	9,000	9,000	9,000	8,160	Nevada Power
Annual Capacity Factor (%/yr)	100	100	100	100	Nevada Power
NOx [PSD sig level = 40 tpy]					
NOx Stack Emissions (lb/MMBtu)	0.460	0.460	0.460	0.460	Reid Gardner Title V Permit
NOx Stack Emissions (lb/hr)	559	559	569	1360	Calculated
NOx Stack Emissions (tpy)	2,448	2,448	2,492	5,956	Calculated
SO_2 [PSD sig level = 40 tpy]					
SO_2 Stack Emissions (lb/MMBtu)	0.370	0.370	0.370	0.290	Reid Gardner Title V Permit
SO_2 Stack Emissions (lb/hr)	450	450	458	857	Calculated
SO_2 Stack Emissions (tpy)	1,969	1,969	2,005	3,755	Calculated
CO [PSD sig level = 100 tpy]					
CO Emission Factor (lb/ton)	0.500	0.500	0.500	0.500	AP-42, Table 1.1-3
CO Stack Emissions (lb/hr)	1000	1000	1200	12000	Calculated
CO Stack Emissions (tpy)	4380	4380	5256	52560	Calculated
PM_{10} [PSD sig level = 15 tpy]					
PM_{10} Stack Emissions (lb/MMBtu)	0.080	0.080	0.080	0.030	Reid Gardner Title V Permit
PM_{10} Stack Emissions (lb/hr)	97.2	97.2	99.0	88.7	Calculated
PM_{10} Stack Emissions (tpy)	426	426	433	388	Calculated
$PM_{2.5}$ [PSD sig level = 15 tpy]					
$PM_{2.5}$ Stack Emissions (lb/MMBtu)	0.080	0.080	0.080	0.030	Reid Gardner Title V Permit
$PM_{2.5}$ Stack Emissions (lb/hr)	0.0	0.0	0.0	0.0	Calculated
$PM_{2.5}$ Stack Emissions (tpy)	4	4	4	4	Calculated
VOC [PSD sig level = 40 tpy]					
VOC Emission Factor (lb/ton)	0.06	0.060	0.060	0.060	AP-42, Table 1.1-19
VOC Emissions (lb/hr)	430.0	430.0	510.0	910.0	Calculated
VOC Emissions (tpy)	1883.4	1883.4	2233.8	3985.8	Calculated

REID GARDNER GENERATING STATION

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION BUREAU OF AIR POLLUTION CONTROL

Unit	S2.005	Unit #1 Cooling Tower	
Cooling water TDS concentration (mg/L)	8,500	**Water flow rate (gpm)**	63,800
Hours/year	8760	**Total liquid drift factor (%)**	0.0005

Criteria Pollutant	**Cooling Water Emission Factor***	**Emission Factor Source**	**Tower Emissions (lb/hr)**	**Tower Emissions (ton/yr)**
Total Particulate Matter (PM)	Assume PM as PM_{10}[1]	*AP-42*	1.36	5.94
Particulates as PM_{10}	Calculation[1]	*AP-42*	1.36	5.94
Sulfur Dioxide	NA		NA	NA
Carbon Monoxide	NA		NA	NA
Oxides of Nitrogen	NA		NA	NA
Volatile Organic Compounds	NA		NA	NA
Lead	NA		NA	NA

Note: Drift is 0.0005% per manufacturer specifications.

[1] Tower Emissions = TDS concentration x total liquid drift factor x circulating water rate x 8.34 lb/gal x

REID GARDNER GENERATING STATION

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION BUREAU OF AIR POLLUTION CONTROL

Unit	S2.006	Unit #2 Cooling Tower	
Cooling water TDS concentration (mg/L)	8,500	**Water flow rate (gpm)**	63,800
Hours/year	8760	**Total liquid drift factor (%)**	0.0005

Criteria Pollutant	**Cooling Water Emission Factor***	**Emission Factor Source**	**Tower Emissions (lb/hr)**	**Tower Emissions (ton/yr)**
Total Particulate Matter (PM)	Assume PM as PM_{10}[1]	*AP-42*	1.36	5.94
Particulates as PM_{10}	Calculation[1]	*AP-42*	1.36	5.94
Sulfur Dioxide	NA		NA	NA
Carbon Monoxide	NA		NA	NA
Oxides of Nitrogen	NA		NA	NA
Volatile Organic Compounds	NA		NA	NA
Lead	NA		NA	NA

Note: Drift is 0.0005% per manufacturer specifications.

[1] Tower Emissions = TDS concentration x total liquid drift factor x circulating water rate x 8.34 lb/gal x

REID GARDNER GENERATING STATION

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION BUREAU OF AIR POLLUTION CONTROL

Unit	S2.007	Unit #3 Cooling Tower	
Cooling water TDS concentration (mg/L)	8,500	**Water flow rate (gpm)**	63,800
Hours/year	8760	**Total liquid drift factor (%)**	0.0005

Criteria Pollutant	**Cooling Water Emission Factor***	**Emission Factor Source**	**Tower Emissions (lb/hr)**	**Tower Emissions (ton/yr)**
Total Particulate Matter (PM)	Assume PM as PM_{10}[1]	*AP-42*	1.36	5.94
Particulates as PM_{10}	Calculation[1]	*AP-42*	1.36	5.94
Carbon Monoxide	NA		NA	NA
Oxides of Nitrogen	NA		NA	NA
Volatile Organic Compounds	NA		NA	NA
Lead	NA		NA	NA

Note: Drift is 0.0005% per manufacturer specifications.

[1] Tower Emissions = TDS concentration x total liquid drift factor x circulating water rate x 8.34 lb/gal x

REID GARDNER GENERATING STATION

NEVADA DIVISION OF ENVIRONMENTAL PROTECTION BUREAU OF AIR POLLUTION CONTROL

Unit	S2.008	Unit #4 Cooling Tower	
Cooling water TDS concentration (mg/L)	8,500	**Water flow rate (gpm)**	131,000
Hours/year	8760	**Total liquid drift factor (%)**	0.0023

Criteria Pollutant	**Cooling Water Emission Factor***	**Emission Factor Source**	**Tower Emissions (lb/hr)**	**Tower Emissions (ton/yr)**
Total Particulate Matter (PM)	Assume PM as PM_{10}[1]	*AP-42*	12.82	56.13
Particulates as PM_{10}	Calculation[1]	*AP-42*	12.82	56.13
Carbon Monoxide	NA		NA	NA
Oxides of Nitrogen	NA		NA	NA
Volatile Organic Compounds	NA		NA	NA
Lead	NA		NA	NA

Note: Drift is 0.0023% per manufacturer specifications.

[1] Tower Emissions = TDS concentration x total liquid drift factor x circulating water rate x 8.34 lb/gal x

Nevada Power
Coal Unloading Station and Coal Conveying Equipment (PF1.001)

Coal handling
Emission factor from AP-42, Section 13.2.4: *Aggregate Handling and Storage Piles* (1/95), Equation (1) - batch or continuous drop operation

E (lb PM_{10} per ton material handled) = k (0.0032) (U/5)^1.3 / [(M/2)^1.4]

where:

k =	0.35	[particles < 10um]
k =	0.74	[particles < 30um]
U =	10	[mph, annual avg wind speed]
M =	4	[%, mean moisture content for coal (as received)]

E (lb PM_{10} per ton handled) = 1.04E-03 at 10 mph
E (lb PM per ton handled) = 2.21E-03 at 10 mph

PF1.001 Annual operating hours 6700 hours
PF1.001 Annual throughput 2,417,690 ton per year

Source ID	Source Name	Process Rate (ton/hour)	Max # Transfers	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual PM Emissions (tpy)	Annual PM_{10} Emissions (tpy)	Control System and Comments
P1.001a	Coal train unloading station into the coal feed hoppers	2500	1	5.52	2.61	95	0.276	0.131	0.134	0.063	Wet supression - fine mist spray and water deluge, enclosed
P1.001b	Coal Transfer from Reclaim Conveyor A1 onto conveyor B	2500	1	5.52	2.61	100.0	0.000	0.000	0.000	0.000	Wet supression - foam, the transfer point is enclosed, emissions
P1.001c	Coal Transfer from Reclaim Conveyor A2 onto conveyor B	2500	1	5.52	2.61	100.0	0.000	0.000	0.000	0.000	Wet supression - foam, the transfer point is enclosed, emissions
P1.001d	Transfer of coal from conveyor B onto conveyors C or F	2500	1	5.52	2.61	99.5	0.028	0.013	0.013	0.006	Wet supression - foam, the transfer point is enclosed, emissions
P1.001e	Transfer of coal from conveyor F onto conveyor G or N	2500	1	5.52	2.61	99.5	0.028	0.013	0.013	0.006	Wet supression - foam, the transfer point is enclosed, emissions
P1.001g	Transfer of coal from conveyor C into reclaim stackout # 1	2500	1	5.52	2.61	95	0.276	0.131	0.134	0.063	Telescopic chute and the transfer point is enclosed.
P1.001h	Transfer of coal from conveyor G into reclaim stackout # 2	2500	1	5.52	2.61	95	0.276	0.131	0.134	0.063	The transfer point is enclosed.
P1.001i	Transfer of coal from conveyor N onto Reclaim stockout pile # 3	2500	1	5.52	2.61	95	0.276	0.131	0.134	0.063	The transfer point is enclosed.
						Total	**1.16**	**0.55**	**0.56**	**0.27**	

Notes:
1) Control efficiencies from *Reasonably Available Control Measures for Fugitive Dust* , Section 2.1 General Fugitive Dust Emission Sources. Environmental Protection Agency, Ohio.
2) Railcar unloading hoppers A1 and A2 are underground with no ventilation. Hence these are not emission sources.
3) Can only bring coal to one stockout pile at a time.

Wind Erosion
Reference: Control of Open Fugitive Dust Sources, Section 4.1.3, EPA-450/3-98-008
[Wind Emissions From Continuously Active Piles]

E (lb PM per day per acre) = 1.7 (s/1.5) (365-p/235) (f/15)

where:

s =	2.2	silt content %	[from AP-42 Table 13.2.4-1 (coal as received at coal-fired power plant)
p =	60	number of days with >0.01 inches precip. per year [from AP-42 Figure 13.2.2-1]	
f =	22.5	percentage of time that wind speed exceeds 5.4 m/s at mean pile height	
E =	4.9	lb PM per day per acre	
E =	2.4	lb PM-10 per day per acre [using PM-10 to PM ratio of 0.5 from EPA-450/3-98-008]	

Source ID	Source Name	Coal pile size (acres)	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Controlled PM Emissions (tpy)	Controlled PM_{10} Emissions (tpy)	Control System
P1.001q	Inactive Coal Storage Pile	8.0	1.62	0.81	99	0.02	0.01	0.07	0.04	Chemical Suppressants
P1.001p	Active Coal Storage Pile	2.2	0.44	0.22	90	0.04	0.02	0.19	0.10	Water Sprays Surfactant
					Total	**0.06**	**0.03**	**0.27**	**0.13**	

Maintenance of Storage Pile (Bulldozing)
Reference: AP-42, Table 11.9-1 (Western Surface Coal Mining)

E (lb PM per hour) = 78.4 (s)^1.2 / (M)^1.3
E (lb PM-10 per hour) = (0.75) 18.6 (s)^1.5 / (M)^1.4
E (lb PM-2.5 per hour) = (0.022) 18.6 (s)^1.5 / (M)^1.4

where:

s =	2.2	silt content %	[from AP-42 Table 13.2.4-1 (coal as received at coal-fired power plant)
M =	4.0	moisture %	[mean moisture content for coal (as received)]
E =	33.31	lb/hr PM	
E =	6.54	lb/hr PM-10	

Source ID	Source Name	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Controlled PM Emissions (tpy)	Controlled PM_{10} Emissions (tpy)	Control System (Note 2)
P1.001p	Active Coal Storage Pile	33.31	6.54	50	16.65	3.27	72.94	14.31	Water Sprays

	Controlled Emissions (lb PM/hr)	Controlled PM Emissions (tpy)	Controlled Emissions (lb PM_{10}/hr)	Controlled PM_{10} Emissions (tpy)	Controlled Emissions (lb $PM_{2.5}$/hr)	Controlled $PM_{2.5}$ Emissions (tpy)
Total	**17.87**	**73.77**	**3.85**	**14.71**	**#REF!**	**#REF!**

Notes:
1) Control efficiencies from *Reasonably Available Control Measures for Fugitive Dust* , Section 2.1 General Fugitive Dust Emission Sources. Environmental Protection Agency, Ohio.
2) No maintenance activities associated with the inactive portion of the pile

Nevada Power
Unit 4 Coal Unloading Station and Coal Conveying Equipment (PF1.002)

Coal handling
Emission factor from AP-42, Section 13.2.4: *Aggregate Handling and Storage Piles* (1/95), Equation (1) - batch or continuous drop operation

E (lb PM_{10} per ton material handled) = k (0.0032) (U/5)^1.3 / [(M/2)^1.4]

where:

k =	0.35	[particles < 10um]
k =	0.74	[particles < 30um]
U =	10	[mph, annual avg wind speed]
M =	4	[%, mean moisture content for coal (as received)]

E (lb PM_{10} per ton handled) = 1.04E-03 at 10 mph

E (lb PM per ton handled) = 2.21E-03 at 10 mph

PF1.002 Annual operating hours 8760 hours

PF1.002 Annual throughput 1,079,232 tons per year

Source ID	Source Name	Process Rate (ton/hour)	Max # Transfers	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual PM Emissions (tpy)	Annual PM_{10} Emissions (tpy)	Control System and Comments	Comments
P1.002i	Transfer of coal from reclaim pile onto conveyors O-1 and O-2	700	2	3.09	1.46	100	0.000	0.000	0.000	0.000	Dustless Transfer Point	Coal transferred for Unit 4. The transfer point has a dustless systems. No emissions are expected from the transfer
P1.002j	Transfer of coal from conveyors O-1 and O-2 onto Conveyor P-1 and P-2	700	2	3.09	1.46	99.5	0.015	0.007	0.006	0.003	Transfer point is enclosed, emissions through two dust bags.	Coal transferred for Unit 4. Annual Emissions based on coal usage for Unit 3.
P1.002l	Transfer of coal from conveyors P-1 and P-2 into the coal silos	Emissions from coal transfer into the silos shown on the coal silo worksheet. Transfer of coal from R, S and T conveyors into the silos are also accounted for on the coal silo worksheet as the total drop into the silos is only 1,800 TPH.										
						Total	**0.015**	**0.007**	**0.006**	**0.003**		

Notes:
1) Control efficiencies from *Reasonably Available Control Measures for Fugitive Dust* , Section 2.1 General Fugitive Dust Emission Sources. Environmental Protection Agency, Ohio.

Grain loading

Emissions vent through Engart dust extractors. Emissions are based on grain loading and emission flow rate.

Source ID	Source Name	Flow Rate (CFM)	Grain Load (gr/ft^3)	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual PM Emissions (tpy)	Annual PM_{10} Emissions (tpy)	Control System and Comments	Comments
TBD	Single emission point for Engart O.	36,000	0.0037	1.142	1.142	1.14	1.14	5.00	5.00	Emissions vent through Engart 36 model unit.	Coal transferred for Unit 4. Annual Emissions based on coal usage for Unit 3.

Wind Erosion

Reference: Control of Open Fugitive Dust Sources, Section 4.1.3, EPA-450/3-98-008
[Wind Emissions From Continuously Active Piles]

E (lb PM per day per acre) = 1.7 (s/1.5) (365-p/235) (f/15)

where:

s =	2.2	silt content % [from AP-42 Table 13.2.4-1 (coal as received at coal-fired power plant)
p =	60	number of days with >0.01 inches precip. per year [from AP-42 Figure 13.2.2-1]
f =	22.5	percentage of time that wind speed exceeds 5.4 m/s at mean pile height
E =	4.9	lb PM per day per acre
E =	2.4	lb PM-10 per day per acre [using PM-10 to PM ratio of 0.5 from EPA-450/3-98-008]

Source ID	Source Name	Coal pile size (acres)	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Controlled PM Emissions (tpy)	Controlled PM_{10} Emissions (tpy)	Control System
P1.002e	Active Coal Storage Pile	8.1	1.63	0.81	90	0.16	0.08	0.71	0.36	Water Sprays
P1.002f	Inactive Coal Storage Pile	4.1	0.84	0.42	99	0.01	0.004	0.04	0.02	Water Sprays
				Total		**0.17**	**0.09**	**0.75**	**0.38**	

Maintenance of Storage Pile (Bulldozing)

Reference: AP-42, Table 11.9-1 (Western Surface Coal Mining)

E (lb PM per hour) = 78.4 (s)^1.2 / (M)^1.3

E (lb PM-10 per hour) = (0.75) 18.6 (s)^1.5 / (M)^1.4

E (lb PM-2.5 per hour) = (0.022) 18.6 (s)^1.5 / (M)^1.4

where:

s =	2.2	silt content % [from AP-42 Table 13.2.4-1 (coal as received at coal-fired power plant)
M =	4.0	moisture % [mean moisture content for coal (as received)]
E =	33.31	lb/hr PM
E =	6.54	lb/hr PM-10
E =	0.19	

Source ID	Source Name	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Uncontrolled Emissions (lb $PM_{2.5}$/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Controlled PM Emissions (tpy)	Controlled PM_{10} Emissions (tpy)	Control System (Note 2)
P1.001p	Active Coal Storage Pile	33.31	6.54	0.19	50	16.65	3.27	72.94	14.31	Water Sprays

	Controlled Emissions (lb PM/hr)	Controlled PM Emissions (tpy)	Controlled Emissions (lb PM_{10}/hr)	Controlled PM_{10} Emissions (tpy)
Total	**17.98**	**78.70**	**4.50**	**19.69**

Notes:

1) Control efficiencies from *Reasonably Available Control Measures for Fugitive Dust* , Section 2.1 General Fugitive Dust Emission Sources. Environmental Protection Agency, Ohio.
2) No maintenance activities associated with the inactive portion of the pile

Nevada Power
Coal Silos - Loading and Unloading (S2.010, PF1.003, S2.011, PF1.004)

Coal handling
Emission factor from AP-42, Section 13.2.4: *Aggregate Handling and Storage Piles* (1/95), Equation (1) - batch or continuous drop operation

E (lb PM_{10} per ton material handled) = k (0.0032) (U/5)^1.3 / [(M/2)^1.4]

where:

k =	0.35	[particles < 10um]
k =	0.74	[particles < 30um]
U =	10	[mph, annual avg wind speed]
U =	1	[mph, avg wind speed, Reduced]
M =	4	[%, mean moisture content for coal (as received)]

E (lb PM_{10} per ton handled) =	1.04E-03	at 10 mph
E (lb PM per ton handled) =	2.21E-03	at 10 mph
E (lb PM_{10} per ton handled) =	5.24E-05	at 1 mph
E (lb PM per ton handled) =	1.11E-04	at 1 mph

System annual operating hours	8760	hours
Coal Silo 23 annual throughput	1,338,458	tons per year
Coal Silo 4 annual throughput	1,078,943	tons per year

Source ID (from permit)	Source Name	Process Rate (ton/hour)	Max # Transfers	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual PM Emissions (tpy)	Annual PM_{10} Emissions (tpy)	Control System and Comments	Comments
PF1.003	Unloading of Coal Silos for Units 1-3	152.8	1	0.34	0.16	100	0.00	0.00	0.00	0.00	Dustless Transfer Point	Coal transferred for three units. The transfer point has a dustless systems. No emissions are expected from the transfer.
PF1.004	Unloading of Coal Silos for Units 4	123.2	1	0.27	0.13	100	0.00	0.00	0.00	0.00	Dustless Transfer Point	Coal transferred for three units. The transfer point has a dustless systems. No emissions are expected from the transfer.
						Total	**0.00**	**0.00**	**0.00**	**0.00**		

Grain loading
Emissions from these sources now vent through Engart dust extractors. Emissions are based on grain loading and emission flow rate.

Source ID	Source Name	Flow Rate (CFM)	Grain Load (gr/ft^3)	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual PM Emissions (tpy)	Annual PM_{10} Emissions (tpy)	Control System and Comments	Comments
S2.010	Conveyor D to Conveyor E, Conveyor J to Conveyor M and K, and Unit 1-3 Loading into the Coal Silos (E,M,K constrained by E Tripper & J) - Engart 123a & Engart 123b single emission point	42,500	0.0037	1.348	1.348	1.35	1.35	5.90	5.90	Emissions vent through Engart 33 model unit.	Coal transferred for Unit 4. Annual Emissions based on coal usage for Unit 3.
S2.011	Unit 4 Loading into the Coal Silos - Engart 4a and 4b single emission point	34,250	0.0037	1.086	1.086	1.09	1.09	4.76	4.76	Emissions vent through one Engart 24 and one Engart 33 model unit, out a single stack.	Coal transferred for Unit 4. Annual Emissions based on coal usage for Unit 3.
	TOTAL					**2.43**	**2.43**	**10.66**	**10.66**		

S2.010 Annual operating hours	8,760
S2.011 Annual operating hours	8,760

Nevada Power
Flyash Silos - Loading and Unloading (S2.012, PF1.009, S2.013, PF1.010, S2.014, PF1.011)

Emission factor from AP-42, Section 13.2.4: *Aggregate Handling and Storage Piles* (1/95), Equation (1) - batch or continuous drop operation

E (lb PM_{10} per ton material handled) = k (0.0032) (U/5)^1.3 / [(M/2)^1.4]

where:

k =	0.35	[particles < 10um]
k =	0.74	[particles < 30um]
U =	10	[mph, avg wind speed]
		[Reid Gardner Title V Permit]
M =	1	[%, mean moisture content for fly ash (AP42)]

E (lb PM_{10} per ton handled) = 7.28E-03
E (lb PM per ton handled) = 1.54E-02

Source ID	Source Name	Process Rate (ton/hour)	Max # Transfers	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual PM Emissions (tpy)	Annual PM_{10} Emissions (tpy)	Control System and Comments
S2.012	Unit 1-3 Loading into the Flyash Silos	27	1	0.42	0.20	90	0.0415	0.0197	0.18	0.09	Emissions vented through baghouse
PF1.009	Unit 1-3 Unloading from the Flyash Silos	250	1	3.85	1.82	87.5	0.481	0.227	0.23	0.11	Unloading point is partially enclosed. Water Sprays are used for dust control
S2.013	Unit 1-3 Loading into the Flyash Backup Silos	27	1	0.42	0.20	90	0.0415	0.0197	0.18	0.09	Emissions vented through baghouse
PF1.010	Unit 1-3 Unloading from the Flyash Backup Silos	250	1	3.85	1.82	87.5	0.481	0.227	0.23	0.11	Unloading point is partially enclosed. Water Sprays are used for dust control
S2.014	Unit 4 Loading into the Flyash Silos	65	1	1.00	0.47	90	0.10	0.047	0.44	0.21	Emissions vented through baghouse
PF1.011	Unit 4 Unloading from the Flyash Silos	250	1	3.85	1.82	87.5	0.48	0.23	0.55	0.26	Unloading point is partially enclosed. Water Sprays are used for dust control
						Total	**1.63**	**0.77**	**1.80**	**0.85**	

Notes:
1) Control efficiencies from *Reasonably Available Control Measures for Fugitive Dust* , Section 2.1 General Fugitive Dust Emission Sources. Environmental Protection Agency, Ohio.
2) Ash loading rates into the silos provided by Reid Gardner.

Calculation for fly ash produced

	Unit 1	Unit 4	
Fly ash produced	236,520	569,400	tons per yr

Calculation for fly ash unloading rate

Silo Diameter (ft)
Silo Height (ft)
Silo Volume (ft3)
Silo Volume (m3)
Silo Volume (yd3)
Fly Ash Density (ton/yd3)
Mass of Fly Ash (ton)

Unloading time (hrs)

Unloading rate (TPH)

Calculation for bottom ash

Bottom ash produced
Bottom ash produced

Nevada Power
Soda Ash Silos - Loading and Unloading (S2.015, PF1.012, S2.016, PF1.013)

Emission factor from AP-42, Section 13.2.4: *Aggregate Handling and Storage Piles* (1/95), Equation (1) - batch or continuous drop operation

E (lb PM_{10} per ton material handled) = k (0.0032) (U/5)^1.3 / [(M/2)^1.4]

where:

k = 0.35	[particles < 10um]
k = 0.74	[particles < 30um]
U = 10	[mph, avg wind speed]
	[Reid Gardner Title V Permit]
M = 1	[%, mean moisture content for soda ash (estimated)]

E (lb PM_{10} per ton handled) = 7.28E-03
E (lb PM per ton handled) = 1.54E-02

Source ID	Source Name	Process Rate (ton/hour)	Max # Transfers	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual PM Emissions (tpy)	Annual PM_{10} Emissions (tpy)	Control System and Comments
S2.015	Unit 1-3 Loading Soda Ash Slurry Tank	30	1	0.46	0.22	80	0.09	0.04	0.37	0.17	Emissions vented through venturi Scrubber
PF1.012	Unit 1-3 Unloading Soda Ash Slurry Tank	13.5	1	0.21	0.10	100	0.00	0.00	0.00	0.00	Material is wet
S2.016	Unit 4 Loading Soda Ash Slurry Tank	30	1	0.46	0.22	80	0.09	0.04	0.12	0.06	Emissions vented through venturi Scrubber
PF1.013	Unit 4 Unloading Soda Ash Slurry Tank	13.5	1	0.21	0.10	100	0.00	0.00	0.00	0.00	Material is wet
						Total	**0.18**	**0.09**	**0.49**	**0.23**	

Notes:
1) Control efficiencies from *Reasonably Available Control Measures for Fugitive Dust* , Section 2.1 General Fugitive Dust Emission Sources. Environmental Protection Agency, Ohio.
2) Assumed the same loading and unloading rates for the ash slurry tanks as an conservative estimate.

Annual Material Handled (TPY):

S2.015	88,038
PF1.012	88,038
S2.016	77,982
PF1.013	77,982

Nevada Power
Lime Silos - Loading and Unloading (S2.017, PF1.014)

Emission factor from AP-42, Section 13.2.4: *Aggregate Handling and Storage Piles* (1/95), Equation (1) - batch or continuous drop operation

E (lb PM_{10} per ton material handled) = k (0.0032) (U/5)^1.3 / [(M/2)^1.4]

where:

k =	0.35	[particles < 10um]
k =	0.74	[particles < 30um]
U =	10	[mph, avg wind speed]
		[Reid Gardner Title V Permit]
M =	1	[%, mean moisture content for soda ash (estimated)]

E (lb PM_{10} per ton handled) = 7.28E-03

E (lb PM per ton handled) = 1.54E-02

Source ID	Source Name	Process Rate (ton/hour)	Max # Transfers	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual PM Emissions (tpy)	Annual PM_{10} Emissions (tpy)
S2.017	Unit 4 Loading Lime Storage Silo	40	1	0.62	0.29	90	0.062	0.029	0.002	0.001
PF1.014	Unit 4 Unloading Lime Storage Silo	0.29	1	0.00	0.00	50	0.002	0.001	0.010	0.005
						Total	**0.064**	**0.030**	**0.012**	**0.006**

Notes:
1) Control efficiencies from *Reasonably Available Control Measures for Fugitive Dust*, Section 2.1 General Fugitive Dust Emission Sources. Environmental Protection Agency, Ohio.
2) Lime loading and Unloading rates provided by Reid Gardner. Nevada Power would like to use the above process rates in their permits.

Annual Material Handled (TPY):

S2.017	2,540
PF1.014	2,540

Reid Gardner Haul Road Emissions and Dispersion Model Input

Emissions

Road Sources		Maximum Controlled Emissions (lb PM/hr)	Maximum Controlled Emissions (lb PM_{10}/hr)	Maximum Controlled Emissions (lb $PM_{2.5}$/hr)	Annual Controlled PM Emissions (tpy)	Annual Controlled PM_{10} Emissions (tpy)	Annual Controlled $PM_{2.5}$ Emissions (tpy)
Unpaved Pond Construction Haul Roads		201.01	51.85	7.78	261.31	67.41	10.11
Unpaved Ash Haul Roads		133.02	34.32	5.15	131.46	33.91	5.09
TOTAL		**334.02**	**86.17**	**12.93**	**392.76**	**101.32**	**15.20**

Model Inputs

Volume Source Representation

Road Sources	Description
ALL1 - ALL18	Inside Coal yard to pond construction truck entrance
ALL18 - ALL34	Pond construction truck entrance to northernmost part of ash haul road, north of pond
ALL35 - ALL83	Northernmost part of ash haul road north of pond to ash dump

Road Sources	Controls	Q from Ash Haul (g/s per source)	Q from Pond Construction (g/s per source)	Total Q (g/s_per_source)
ALL1 - ALL18	85% control, 12 RT/hr Ash	0.0223	0.0000	0.0223
ALL18 - ALL34	85% control, 12 RT/hr Ash, 30 RT/hr Pond Const.	0.0298	0.0503	0.0800
ALL35 - ALL83	80% control, 12 RT/hr Ash, 30 RT/hr Pond Const.	0.0298	0.0503	0.0800

Nevada Power
Unpaved Contractor Haul Roads (from ponds to landfill)
This worksheet estimates emissions for unpaved section of the road. Unpaved Emission Factors are used.

Unpaved Roads emission factor for industrial roads from AP-42, Section 13.2.2: *Unpaved Roads* (12/03), Equation (2) - corrected to account for annual precipitation

E_U (lb per vehicle mile traveled) = $(k(s/12)^a(W/3)^b)((365-p)/365)$

where:

k =	1.5	[Table 13.2.2-2, for PM_{10}]
k =	4.9	[Table 13.2.2-2, for PM]
s =	5.1	[silt content (%) for coal mine plant road, Table 13.2.2-1]
a =	0.9	[Table 13.2.2-2, for PM_{10}]
a =	0.7	[Table 13.2.2-2, for PM]
W=	37	[mean vehicle weight(tons)] Assume empty truck weight of 24 tons and full load truck at 50 tons
b =	0.45	[Table 13.2.2-2, for PM_{10} and PM]
p=	60	number of days with >0.01 inches precip. per year [from AP-42 Figure 13.2.2-1]
E_U =	1.797	[PM_{10}]
E_U =	6.967	[PM]

Haul truck maximum load =	26	tons per truck
Percentage trucked =	100%	
Haul road round trip =	2.40	miles
Round trips per hour =	30.00	RT
Round trips per year =	78000	RT (assumed 10 hours/day, 5 days/week, 52 weeks/year)
VMT (per hour) =	72.1	miles
VMT (annual) =	187,525	miles

Ash Unpaved Haul Road from pond const. truck entrance to northernmost part of ash haul road

Source ID	Source Name	Maximum Uncontrolled Emissions (lb PM/hr)	Maximum Uncontrolled Emissions (lb PM_{10}/hr)	Annual Uncontrolled PM Emissions (tpy)	Annual Uncontrolled PM_{10} Emissions (tpy)	Control %	Maximum Controlled Emissions (lb PM/hr)	Maximum Controlled Emissions (lb PM_{10}/hr)	Maximum Controlled Emissions (lb $PM_{2.5}$/hr)	Annual Controlled PM Emissions (tpy)	Annual Controlled PM_{10} Emissions (tpy)
All1-All18	Unpaved Contractor Trucks haul roads	502.51	129.63	653.27	168.52	80	101	25.93	3.89	130.65	33.70

Ash Unpaved Haul Road from northernmost part of ash haul road to ash dump

Source ID	Source Name	Maximum Uncontrolled Emissions (lb PM/hr)	Maximum Uncontrolled Emissions (lb PM_{10}/hr)	Annual Uncontrolled PM Emissions (tpy)	Annual Uncontrolled PM_{10} Emissions (tpy)	Control %	Maximum Controlled Emissions (lb PM/hr)	Maximum Controlled Emissions (lb PM_{10}/hr)	Maximum Controlled Emissions (lb $PM_{2.5}$/hr)	Annual Controlled PM Emissions (tpy)	Annual Controlled PM_{10} Emissions (tpy)
All18-All83	Unpaved Contractor Trucks haul roads	502.51	129.63	653.27	168.52	80	101	25.93	3.89	130.65	33.70
Total Emissions							**201.0053**	**51.85**	**7.78**	**261.31**	**67.4099**

Notes:

1) Control efficiencies from *Reasonably Available Control Measures for Fugitive Dust*, Section 2.1 General Fugitive Dust Emission Sources. Environmental Protection Agency, Ohio.
2) Both fly ash and bottom ash are hauled to the landfill.

Nevada Power
Unpaved Ash Haul Roads (sent to landfill) (New Emission Unit)
This worksheet estimates emissions for unpaved section of the road. Unpaved Emission Factors are used.

Unpaved Roads emission factor for industrial roads from AP-42, Section 13.2.2: *Unpaved Roads* (12/03), Equation (2) - corrected to account for annual precipitation

E_U (lb per vehicle mile traveled) = $(k(s/12)^a(W/3)^b)((365-p)/365)$

where:

k =	1.5	[Table 13.2.2-2, for PM_{10}]
k =	4.9	[Table 13.2.2-2, for PM]
s =	5.1	[silt content (%) for coal mine plant road, Table 13.2.2-1]
a =	0.9	[Table 13.2.2-2, for PM_{10}]
a =	0.7	[Table 13.2.2-2, for PM]
W=	37	[mean vehicle weight(tons)] Assume empty truck weight of 24 tons and full load truck at 50 tons
b =	0.45	[Table 13.2.2-2, for PM_{10} and PM]
p=	60	number of days with >0.01 inches precip. per year [from AP-42 Figure 13.2.2-1]
E_U =	1.797	[PM_{10}]
E_U =	6.967	[PM]

Haul truck maximum load =	26	tons per truck	
Amount of Ash produced (per year) =	616,675	tons	
Percentage trucked =	100%		
Amount hauled (per hour) =	518	tons	
Haul road round trip =	4.55	miles	24,000 ft roundtrip
Round trips per hour =	12.00	(assumes 10 hours per day operation)	
Round trips per year =	23,718		
VMT (per hour) =	54.5	miles	
VMT (annual) =	107,817	miles	

Ash Unpaved Haul Road from pond const. truck entrance to northernmost part of ash haul road

Source ID	Source Name	Maximum Uncontrolled Emissions (lb PM/hr)	Maximum Uncontrolled Emissions (lb PM_{10}/hr)	Annual Uncontrolled PM Emissions (tpy)	Annual Uncontrolled PM_{10} Emissions (tpy)	Control %	Maximum Controlled Emissions (lb PM/hr)	Maximum Controlled Emissions (lb PM_{10}/hr)	Maximum Controlled Emissions (lb $PM_{2.5}$/hr)	Annual Controlled PM Emissions (tpy)	Annual Controlled PM_{10} Emissions (tpy)
	Unpaved Ash haul roads	380.05	98.04	375.59	96.89	85	57	14.71	2.21	56.34	14.53

Ash Unpaved Haul Road from northernmost part of ash haul road to ash dump

Source ID	Source Name	Maximum Uncontrolled Emissions (lb PM/hr)	Maximum Uncontrolled Emissions (lb PM_{10}/hr)	Annual Uncontrolled PM Emissions (tpy)	Annual Uncontrolled PM_{10} Emissions (tpy)	Control %	Maximum Controlled Emissions (lb PM/hr)	Maximum Controlled Emissions (lb PM_{10}/hr)	Maximum Controlled Emissions (lb $PM_{2.5}$/hr)	Annual Controlled PM Emissions (tpy)	Annual Controlled PM_{10} Emissions (tpy)
	Unpaved Ash haul roads	380.05	98.04	375.59	96.89	80	76	19.61	2.94	75.12	19.38
Total Emissions							**133.02**	**34.32**	**5.15**	**131.46**	**33.91**

Notes:

1) Control efficiencies from *Reasonably Available Control Measures for Fugitive Dust*, Section 2.1 General Fugitive Dust Emission Sources. Environmental Protection Agency, Ohio.
2) Both fly ash and bottom ash are hauled to the landfill.

Nevada Power
Ash Landfill - Fugitives (New Emission Unit)

Ash Transfer from Truck to the Landfill
Reference: AP-42, Section 13.2.4
[Aggregate Handling and Storage Piles - Batch or continuos drop operation]

TSP $E = k * (0.0032) * [(U/5)^{1.3} / (M/2)^{1.4}]$ AP-42 page 13.2.4-3
PM_{10} $E' = k' * (0.0032) * [(U/5)^{1.3} / (M/2)^{1.4}]$ AP-42 page 13.2.4-3

where:	E = emission factor, lb PM/ton	0.0011	lb PM/ton	Calculated
	E' = emission factor, lb PM_{10}/ton	0.00054	lb PM_{10}/ton	Calculated
	k = particle size multiplier, dimensionless	0.74		AP-42 page 13.2.4-3
	k' = particle size multiplier, dimensionless	0.35		AP-42 page 13.2.4-3
	U = mean wind speed, mph	25	mph	
	M = material moisture content, percent	15	%	Sprayed with water to reduce dust

Source ID	Source Name	Quantity of ash transferred (tons per yr)	Quantity of ash transferred (tons per hr)	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual Controlled PM_{10} Emissions (tpy)	Annual Controlled PM_{10} Emissions (tpy)	Control
	Material Truck Dump onto the landfill	616,675	517.6	0.59	0.28	0%	0.59	0.28	0.35	0.17	Water Sprays

Inactive Area of Landfill - Wind Erosion and Maintenance

Wind erosion in the inactive area of the landfill is negligible because the landfill is watered frequently and inactive area is capped to reduce fugitive dust emissions.

Wind Erosion - Active Area

Reference: Control of Open Fugitive Dust Sources, Section 4.1.3, EPA-450/3-98-008
[Wind Emissions From Continuously Active Piles]

E (lb PM per day per acre) : 1.7 (s/1.5) (365-p/235) (f/15)

where:

s =	80.0	silt content % [from AP-42 Table 13.2.4-1 (for fly ash)
p =	60	number of days with >0.01 inches precip. per year [from AP-42 Figure 13.2.2-1]
f =	22.5	percentage of time that wind speed exceeds 5.4 m/s at mean pile height
E =	176.5	lb PM per day per acre
E =	88.3	lb PM-10 per day per acre [using PM-10 to PM ratio of 0.5 from EPA-450/3-98-008]

Source ID	Source Name	Coal pile size (acres)	Controlled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Controlled PM Emissions (tpy)	Controlled PM_{10} Emissions (tpy)	Control System (Note 2)
	Active Landfill	2.0	14.71	7.35	50	7.35	3.68	32.21	16.11	Water Sprays

Maintenance of Ash Landfill - Active Area

Reference: AP-42, Table 11.9-2

E (lb PM per hour) = 5.7 * s1.2 / M1.3
E (lb PM-10 per hour) = (1.0 * s1.5 / M1.4) * 0.75
E (lb PM-2.5 per hour) = (1.0 * s1.5 / M1.4) * 0.022

where:

s =	80.0	silt content %	AP-42, Table 13.2.4-1 for Fly Ash
M =	15	moisture %	
E =	32.41	lb/hr PM	
E =	12.11	lb/hr PM-10	
E =	0.36	lb/hr PM-2.5	

Source ID	Source Name	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Uncontrolled Emissions (lb $PM_{2.5}$/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual Controlled PM Emissions (tpy)	Annual Controlled PM_{10} Emissions (tpy)	Annual Controlled PM_{10} Emissions (tpy)	Control
	Maintenance of ash landfills	32.41	12.11	0.36	50%	16.20	6.06	70.98	26.52	0.78	Additional Water Sprays after the ash is laid on the landfill

	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual Controlled PM Emissions (tpy)	Annual Controlled PM10 Emissions (tpy)
Total	**24.15**	**10.01**	**103.54**	**42.80**

Nevada Power
Units 1-3 Coal Conveying System

Coal handling
Emission factor from AP-42, Section 13.2.4: *Aggregate Handling and Storage Piles* (1/95), Equation (1) - batch or continuous drop operation

E (lb PM_{10} per ton material handled) = k (0.0032) (U/5)^1.3 / [(M/2)^1.4]

where:

k = 0.35 [particles < 10um]
k = 0.74 [particles < 30um]
U = 10 [mph, annual avg wind speed]
M = 4 [%, mean moisture content for coal (as received)]

E (lb PM_{10} per ton handled) = 1.04E-03 at 10 mph
E (lb PM per ton handled) = 2.21E-03 at 10 mph

System annual operating hours 8760 hours
System annual throughput 1,338,458 tons per year

Source ID (from permit)	Source Name	Process Rate (ton/hour)	Max # Transfers	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Control %	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual PM Emissions (tpy)	Annual PM_{10} Emissions (tpy)	Control System and Comments	Comments
TBD	Transfer of coal from bottom of the stockout pile # 1 onto conveyor D	1650	1	3.65	1.72	100	0.00	0.00	0.00	0.00	Dustless Transfer Point	Coal transferred for three units.
TBD	Transfer of coal from bottom of the stockout pile # 2 onto conveyor H	1650	1	3.65	1.72	100	0.00	0.00	0.00	0.00	Dustless Transfer Point	Coal transferred for three units.
						Total	**0.00**	**0.00**	**0.00**	**0.00**		

Notes:
1) Control efficiencies from *Reasonably Available Control Measures for Fugitive Dust*, Section 2.1 General Fugitive Dust Emission Sources. Environmental Protection Agency, Ohio.

Grain loading

Emissions vent through Engart dust extractors. Emissions are based on grain loading and emission flow rate.

Source ID	Source Name	Flow Rate (CFM)	Grain Load (gr/ft^3)	Uncontrolled Emissions (lb PM/hr)	Uncontrolled Emissions (lb PM_{10}/hr)	Controlled Emissions (lb PM/hr)	Controlled Emissions (lb PM_{10}/hr)	Annual PM Emissions (tpy)	Annual PM10 Emissions (tpy)	Control System and Comments	Comments
TBD	Transfer of coal from Feeder D onto Conveyor E - Engart emission point	13,000	0.0037	0.412	0.412	0.412	0.41	1.81	1.81	Emissions vent through Engart dust extractor.	Emissions now vent through Engart D, an Engart 24 model unit.
TBD	Transfer of coal from Feeder H1/H2 onto Conveyor H and Conveyor H onto J - Engart	36,000	0.0037	1.142	1.142	1.142	1.14	5.00	5.00	Emissions vent through Engart dust extractor.	Emisssion vent through Engart 36
					Total	**1.55**	**1.55**	**6.81**	**6.81**		

		Controlled Emissions (lb PM/hr)	Controlled PM Emissions (tpy)	Controlled Emissions (lb PM_{10}/hr)	Controlled PM_{10} Emissions (tpy)
Units 1-3 Coal Conveying System	**Total**	**1.55**	**6.81**	**1.55**	**6.81**

Engart Units

Stack Parameters (english units)				
Unit ID	**ENG_D**	**ENG_U123**	**ENG_U4**	**ENG_H&O**
Type	Engart 24	Engart 33	Engart 24/33	Engart 36
Grain Loading (gr/ft^3)	0.0037	0.0037	0.0037	0.0037
Diameter (ft)	2.00	2.75	2.75	3.00
Area (ft^2)	3.14	5.94	5.94	7.07
Flow Rate (ft^3/min)	13,000	21,250	34,250	36,000
Velocity (ft/s)	68.98	59.64	96.12	84.90
Stack Height (ft)	see below	see below	see below	14.00
Stack Temp	ambient	ambient	ambient	ambient
Emission Rate (lb/hr)	0.412	0.674	1.086	1.142

Stack Parameters (metric units)				
Unit ID	**ENG_D**	**ENG_U123**	**ENG_U4**	**ENG_H&O**
Unit ID	Engart 24	Engart 33	Engart 24/33	Engart 36
Grain Loading (gr/ft^3)	0.0037	0.0037	0.0037	0.0037
Diameter (m)	0.6096	0.8382	0.8382	0.9144
Area (m^2)	0.29	0.55	0.55	0.66
Flow Rate (m^3/min)	368	602	970	1,020
Velocity (m/s)	21.03	18.18	29.30	25.88
Stack Height (m)	see below	see below	see below	4.27
Stack Temp	ambient	ambient	ambient	ambient
Emission Rate (g/s)	0.052	0.085	0.137	0.144

	Stack Height (ft)	Stack Height (m)
ENG_D	7	2.1336
ENGU123	120	36.576
ENG_U4	192.5	58.674

*Note emision rates and outlet grain loading are based on an inlet grain loading

Dust Bags

Stack Parameters			Emission Rate (lb/hr)	
Unit ID	12" Bag	24" Bag	12" Bag	24" Bag
Grain Loading (gr/ft^3)	0.02	0.02	0.077	0.171
Diameter (ft)	1.00	2.00		
Area (ft^2)	0.79	3.14		
Flow Rate (ft^3/min)	450	1,000		
*Velocity (ft/s)	9.55	5.31		
Stack Height (ft)	6.00	6.00		

			Controlled**	
Stack Parameters			Emission Rate (g/s)	
Unit ID	12" Bag	24" Bag	12" Bag	24" Bag
Grain Loading (gr/ft^3)	0.02	0.02	0.0024	0.0054
Diameter (m)	0.3048	0.6096		
Area (m^2)	0.07	0.29		
Flow Rate (m^3/min)	13	28		
Velocity (m/s)	2.91	1.62		
Stack Height (m)	1.83	1.83		

*Note Velocity is calculated but may not be used

** Assume 75% control of emissions per dust bags being within enclosure (see WRAP)

Nevada Power
Unit 1&2 Emergency Generator

Emission Equations: **Hourly Emissions (lbs/hr) = PR (hp) * E (g/hp-hr) * (lb/453.56 g)**
or
Hourly Emissions (lbs/hr) = PR (hp) * E (lb/hp-hr)

24-Hour emissions (lb/hr) = Hourly Emissions (lbs/hr) * D/24hours

Annual emissions (tons/yr) = Hourly Emissions (lbs/hr) * OH * (ton/2000 lbs)

Where:
PR = fire pump rating (hp)
E = emission factor
OH = annual operating hours (hours/year)
D = daily operating hours (hours/day)

Data:

PR =	490	hp
OH =	100	hours/year
D =	8	hours/day

Unit 1&2 Emergency Generator Emissions Estimate

Fire Pump Identification	Pollutant	Emission Factor per Unit	Units	Emission Factor Source	Hourly Emissions[3] (lb/hr)	24-Hour Emissions[4] (lb/hr)	Annual Emissions (tons/yr)
Unit 1&2 Emergency Generator (490 hp) [1]	CO[2]	6.68E-03	lb/hp-hr	AP-42 (10/96) Table 3.3-1	1.0	NA	0.05
	NO_X	0.031	lb/hp-hr	AP-42 (10/96) Table 3.3-1	15.2	NA	0.8
	PM_{10}	2.20E-03	lb/hp-hr	AP-42 (10/96) Table 3.3-1	1.08	0.4	0.05
	PM	2.20E-03	lb/hp-hr	AP-42 (10/96) Table 3.3-1	1.08	0.4	0.05
	VOC	2.51E-03	lb/hp-hr	AP-42 (10/96) Table 3.3-1 [3]	1.23	NA	0.06
	SO_2	2.05E-03	lb/hp-hr	AP-42 (10/96) Table 3.3-1	1.00	NA	0.05

[1] All emission factors are all taken from AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines.
(Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines).

[2] CO emissions are assumed to be reduced by 70% from AP-42 calculated emissions, per 40 CFR 63 Subpart ZZZZ Table 2a (amended March 3, 2010).

[3] The VOC emission factor is equal to 100% of the AP-42 Total Organic Compounds emission factor.

[4] All short-term emissions were calculated based on hourly emission averages, except for PM10, which was calculated based on a 24-hour average.

Hazardous Air Pollutant Basis:

Power Rating	490	HP
Heat Input		MMBtu/hr
Hours of Operation	100	hr/yr
Fuel Use		gal/hr

HAP	Emission factor (lb/MMBtu)	Source	Emission factor* (lb/hp-hr)	Emissions (lb/hr)	Emissions (ton/yr)
1,3 Butadiene	3.91E-05	AP-42 Table 3.3-2	2.74E-07	1.34E-04	6.71E-06
Acetaldehyde	7.67E-04	AP-42 Table 3.3-2	5.37E-06	2.63E-03	1.32E-04
Acrolein	9.25E-05	AP-42 Table 3.3-2	6.48E-07	3.17E-04	1.59E-05
Benzene	9.33E-04	AP-42 Table 3.3-2	6.53E-06	3.20E-03	1.60E-04
Formaldehyde	1.18E-03	AP-42 Table 3.3-2	8.26E-06	4.05E-03	2.02E-04
Naphthalene	8.48E-05	AP-42 Table 3.3-2	5.94E-07	2.91E-04	1.45E-05
Propylene	2.58E-03	AP-42 Table 3.3-2	1.81E-05	8.85E-03	4.42E-04
Toluene	4.09E-04	AP-42 Table 3.3-2	2.86E-06	1.40E-03	7.01E-05
Xylenes	2.85E-04	AP-42 Table 3.3-2	2.00E-06	9.78E-04	4.89E-05
TOTAL				**2.19E-02**	**1.09E-03**

* The lb/hp-hr emission factor was calculated based on the lb/MMBtu emission factor in AP-42 and a conversion factor of 7,000 Btu/hp-hr.

Nevada Power
Unit 3 Emergency Generator

Emission Equations: **Hourly Emissions (lbs/hr) = PR (hp) * E (g/hp-hr) * (lb/453.56 g)**
or
Hourly Emissions (lbs/hr) = PR (hp) * E (lb/hp-hr)

24-Hour emissions (lb/hr) = Hourly Emissions (lbs/hr) * D/24hours

Annual emissions (tons/yr) = Hourly Emissions (lbs/hr) * OH * (ton/2000 lbs)

Where:
PR = fire pump rating (hp)
E = emission factor
OH = annual operating hours (hours/year)
D = daily operating hours (hours/day)

Data:

PR =	197	hp
OH =	100	hours/year
D =	8	hours/day

Unit 3 Emergency Generator Emissions Estimate

Fire Pump Identification	Pollutant	Emission Factor per Unit	Units	Emission Factor Source	Hourly Emissions[3] (lb/hr)	24-Hour Emissions[4] (lb/hr)	Annual Emissions (tons/yr)
Unit 3Emergency Generator (480 hp) [1]	CO[2]	8.00E-01	g/bhp-hr	manufacturer guarantee	0.3	NA	0.02
	NO_X	2.7	g/bhp-hr	manufacturer guarantee	1.2	NA	0.1
	PM_{10}	1.10E-01	g/bhp-hr	manufacturer guarantee	0.05	0.02	0.002
	PM	1.10E-01	g/bhp-hr	manufacturer guarantee	0.05	0.02	0.002
	VOC	1.00E-01	g/bhp-hr	manufacturer guarantee	0.04	NA	0.002
	SO_2	2.05E-03	lb/hp-hr	AP-42 (10/96) Table 3.3-1	0.4	NA	0.02

[1] All emission factors are all taken from AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines.
(Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines).

[2] CO emissions are assumed to be reduced by 70% from AP-42 calculated emissions, per 40 CFR 63 Subpart ZZZZ Table 2a (amended March 3, 2010).

[3] The VOC emission factor is equal to 100% of the AP-42 Total Organic Compounds emission factor.

[4] All short-term emissions were calculated based on hourly emission averages, except for PM10, which was calculated based on a 24-hour average.

Hazardous Air Pollutant Basis:

Power Rating	197	HP
Heat Input		MMBtu/hr
Hours of Operation	100	hr/yr
Fuel Use		gal/hr

HAP	Emission factor (lb/MMBtu)	Source	Emission factor* (lb/hp-hr)	Emissions (lb/hr)	Emissions (ton/yr)
1,3 Butadiene	3.91E-05	AP-42 Table 3.3-2	2.74E-07	5.39E-05	2.70E-06
Acetaldehyde	7.67E-04	AP-42 Table 3.3-2	5.37E-06	1.06E-03	5.29E-05
Acrolein	9.25E-05	AP-42 Table 3.3-2	6.48E-07	1.28E-04	6.38E-06
Benzene	9.33E-04	AP-42 Table 3.3-2	6.53E-06	1.29E-03	6.43E-05
Formaldehyde	1.18E-03	AP-42 Table 3.3-2	8.26E-06	1.63E-03	8.14E-05
Naphthalene	8.48E-05	AP-42 Table 3.3-2	5.94E-07	1.17E-04	5.85E-06
Propylene	2.58E-03	AP-42 Table 3.3-2	1.81E-05	3.56E-03	1.78E-04
Toluene	4.09E-04	AP-42 Table 3.3-2	2.86E-06	5.64E-04	2.82E-05
Xylenes	2.85E-04	AP-42 Table 3.3-2	2.00E-06	3.93E-04	1.97E-05
TOTAL				**8.78E-03**	**4.39E-04**

* The lb/hp-hr emission factor was calculated based on the lb/MMBtu emission factor in AP-42 and a conversion factor of 7,000 Btu/hp-hr.

Nevada Power
Unit 4 Emergency Generator

Emission Equations: **Hourly Emissions (lbs/hr) = PR (hp) * E (g/hp-hr) * (lb/453.56 g)**
or
Hourly Emissions (lbs/hr) = PR (hp) * E (lb/hp-hr)

24-Hour emissions (lb/hr) = Hourly Emissions (lbs/hr) * D/24hours

Annual emissions (tons/yr) = Hourly Emissions (lbs/hr) * OH * (ton/2000 lbs)

Where:
PR = fire pump rating (hp)
E = emission factor
OH = annual operating hours (hours/year)
D = daily operating hours (hours/day)

Data:

PR =	348	hp
OH =	100	hours/year
D =	8	hours/day

Unit 4 Emergency Generator Emissions Estimate

Fire Pump Identification	Pollutant	Emission Factor per Unit	Units	Emission Factor Source	Hourly Emissions[3] (lb/hr)	24-Hour Emissions[4] (lb/hr)	Annual Emissions (tons/yr)
Unit 4 Emergency Generator (348 hp) [1]	CO[2]	6.68E-03	lb/hp-hr	AP-42 (10/96) Table 3.3-1	0.7	NA	0.03
	NO_X	0.031	lb/hp-hr	AP-42 (10/96) Table 3.3-1	10.8	NA	0.5
	PM_{10}	2.20E-03	lb/hp-hr	AP-42 (10/96) Table 3.3-1	0.77	0.3	0.04
	PM	2.20E-03	lb/hp-hr	AP-42 (10/96) Table 3.3-1	0.77	0.3	0.04
	VOC	2.51E-03	lb/hp-hr	AP-42 (10/96) Table 3.3-1 [3]	0.87	NA	0.04
	SO_2	2.05E-03	lb/hp-hr	AP-42 (10/96) Table 3.3-1	0.71	NA	0.04

[1] All emission factors are all taken from AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines.
(Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines).

[2] CO emissions are assumed to be reduced by 70% from AP-42 calculated emissions, per 40 CFR 63 Subpart ZZZZ Table 2a (amended March 3, 2010).

[3] The VOC emission factor is equal to 100% of the AP-42 Total Organic Compounds emission factor.

[4] All short-term emissions were calculated based on hourly emission averages, except for PM10, which was calculated based on a 24-hour average.

Hazardous Air Pollutant Basis:

Power Rating	348	HP
Heat Input		MMBtu/hr
Hours of Operation	100	hr/yr
Fuel Use		gal/hr

HAP	Emission factor (lb/MMBtu)	Source	Emission factor* (lb/hp-hr)	Emissions (lb/hr)	Emissions (ton/yr)
1,3 Butadiene	3.91E-05	AP-42 Table 3.3-2	2.74E-07	9.52E-05	4.76E-06
Acetaldehyde	7.67E-04	AP-42 Table 3.3-2	5.37E-06	1.87E-03	9.34E-05
Acrolein	9.25E-05	AP-42 Table 3.3-2	6.48E-07	2.25E-04	1.13E-05
Benzene	9.33E-04	AP-42 Table 3.3-2	6.53E-06	2.27E-03	1.14E-04
Formaldehyde	1.18E-03	AP-42 Table 3.3-2	8.26E-06	2.87E-03	1.44E-04
Naphthalene	8.48E-05	AP-42 Table 3.3-2	5.94E-07	2.07E-04	1.03E-05
Propylene	2.58E-03	AP-42 Table 3.3-2	1.81E-05	6.28E-03	3.14E-04
Toluene	4.09E-04	AP-42 Table 3.3-2	2.86E-06	9.96E-04	4.98E-05
Xylenes	2.85E-04	AP-42 Table 3.3-2	2.00E-06	6.94E-04	3.47E-05
TOTAL				**1.55E-02**	**7.76E-04**

* The lb/hp-hr emission factor was calculated based on the lb/MMBtu emission factor in AP-42 and a conversion factor of 7,000 Btu/hp-hr.

Nevada Power
Fire Pump

Emission Equations: **Hourly Emissions (lbs/hr) = PR (bhp) * E (g/bhp-hr) * (lb/453.56 g)**
or
Hourly Emissions (lbs/hr) = PR (bhp) * E (lb/bhp-hr)

24-Hour emissions (lb/hr) = Hourly Emissions (lbs/hr) * D/24hours

Annual emissions (tons/yr) = Hourly Emissions (lbs/hr) * OH * (ton/2000 lbs)

Where:
PR = fire pump rating (hp)
E = emission factor
OH = annual operating hours (hours/year)
D = daily operating hours (hours/day)

Data:

PR =	355	bhp
OH =	100	hours/year
D =	8	hours/day

Fire Pump Emissions Estimate

Fire Pump Identification	Pollutant	Emission Factor per Unit	Units	Emission Factor Source	Hourly Emissions[2] (lb/hr)	24-Hour Emissions[3] (lb/hr)	Annual Emissions (tons/yr)
Fire Pump (400 hp) [1]	CO	1.42E+00	g/bhp-hr	manufacturer guarantee	1.1	NA	0.06
	NO_X	2.2	g/bhp-hr	manufacturer guarantee	1.7	NA	0.1
	PM_{10}	1.18E-01	g/bhp-hr	manufacturer guarantee	0.1	0.03	0.005
	PM	1.18E-01	g/bhp-hr	manufacturer guarantee	0.1	0.03	0.005
	VOC	1.23E-01	g/bhp-hr	manufacturer guarantee	0.1	NA	0.005
	SO_2	2.05E-03	lb/hp-hr	AP-42 (10/96) Table 3.3-1	0.7	NA	0.04

[1] All emission factors are all taken from either manufacturer guarantee or AP-42, Table 3.3-1, Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines. (Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engines).

[2] The VOC emission factor is equal to 100% Non methane Hydrocarbon.

[3] All short-term emissions were calculated based on hourly emission averages, except for PM10, which was calculated based on a 24-hour average.

Hazardous Air Pollutant Basis:

Power Rating	355	BHP
Heat Input		MMBtu/hr
Hours of Operation	100	hr/yr
Fuel Use	19	gal/hr

HAP	Emission factor (lb/MMBtu)	Source	Emission factor* (lb/bhp-hr)	Emissions (lb/hr)	Emissions (ton/yr)
1,3 Butadiene	3.91E-05	AP-42 Table 3.3-2	2.74E-07	9.72E-05	4.86E-06
Acetaldehyde	7.67E-04	AP-42 Table 3.3-2	5.37E-06	1.91E-03	9.53E-05
Acrolein	9.25E-05	AP-42 Table 3.3-2	6.48E-07	2.30E-04	1.15E-05
Benzene	9.33E-04	AP-42 Table 3.3-2	6.53E-06	2.32E-03	1.16E-04
Formaldehyde	1.18E-03	AP-42 Table 3.3-2	8.26E-06	2.93E-03	1.47E-04
Naphthalene	8.48E-05	AP-42 Table 3.3-2	5.94E-07	2.11E-04	1.05E-05
Propylene	2.58E-03	AP-42 Table 3.3-2	1.81E-05	6.41E-03	3.21E-04
Toluene	4.09E-04	AP-42 Table 3.3-2	2.86E-06	1.02E-03	5.08E-05
Xylenes	2.85E-04	AP-42 Table 3.3-2	2.00E-06	7.08E-04	3.54E-05
TOTAL				**1.58E-02**	**7.92E-04**

* The lb/hp-hr emission factor was calculated based on the lb/MMBtu emission factor in AP-42 and a conversion factor of 7,000 Btu/hp-hr.

Reid Gardner
Facility - Wide PTE

Emission Unit	lbs/hour							tons/year						
	PM	PM10	NOx	CO	SO2	VOCs	HAPs	PM	PM10	NOx	CO	SO2	VOCs	HAPs
S2.001	97.2	97.2	559	1000	450	430	7.2	426	426	2,448	4380	1,969	1883.4	31.7
S2.002	97.2	97.2	559	1000	450	430	7.2	426	426	2,448	4380	1,969	1883.4	31.7
S2.003	98.96	98.96	569	1200	458	510	7.4	433	433	2,492	5256	2,005	2233.8	32.3
S2.004	88.68	88.68	1360	12000	857	910	19.4	388	388	5,956	52560	3,755	3985.8	85.1
S2.005	1.36	1.36						5.94	5.94					
S2.006	1.36	1.36						5.94	5.94					
S2.007	1.36	1.36						5.94	5.94					
S2.008	12.82	12.82						56.13	56.13					
PF1.001	17.87	3.85					0.0006	73.77	14.71					0.002
PF1.002	0.00	0.00					0.0002	0.00	0.00					0.001
S2.010/PF1.003	1.35	1.35					0.0002	5.90	#REF!					0.001
S2.011/PF1.004	1.09	1.09					0.0002	4.76	#REF!					0.001
S2.012/PF1.009	0.52	0.25						0.41	0.19					
S2.013/PF010	0.52	0.25						0.41	0.19					
S2.014/PF.011	0.58	0.27						0.99	0.47					
S2.015/PF1.012	0.09	0.04						0.37	0.17					
S2.016/PF1.013	0.09	0.04						0.12	0.06					
S2.017/PF1.014	0.06	0.03						0.012	0.006					
Unpaved Haul Roads	126.10	32.53					NA	75.12	19.38					NA
Landfill	24.15	10.01						#REF!	103.54					
Unit 1-3 Coal Conveying	1.55	1.55					0.0003	6.81	6.81					0.001
Fire Pump	0.09	0.09	1.72	1.11	0.73	0.10	0.016	0.005	0.005	0.086	0.055	0.036	0.005	0.000
Unit 1&2 EG	1.08	1.08	15.19	0.98	1.00	1.23	0.001	0.054	0.054	0.760	0.049	0.050	0.062	0.001
Unit 3 EG	0.05	0.05	1.17	0.35	0.40	0.04	0.001	0.002	0.002	0.059	0.017	0.020	0.002	0.000
Unit 4 EG	0.77	0.77	10.79	0.70	0.71	0.87	0.001	0.038	0.038	0.539	0.035	0.036	0.044	0.001
Total	575	452	3,075	15,203	2,217	2,282	41.3	#REF!	#REF!	13,345	66,576	9,698	9,987	180.7

Table A-1

NV Energy

Reid Gardner Unit 1

HAPs Emission Calculations

Emission Calculation

Basis:

Fuel Burn Rate	1,215	MBtu/h
Unit MW (net)	100	MW
Unit MW (gross)	120	MW
Hours of Operation	8,760	h/y
Fuel Heating Value	9,000	Btu/lb

		Uncontrolled			Controlled		
Inorganic Solid HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**
Antimony	1.80E-05	1.00E-04	1.22E-01	0.53	1.00E-06	1.22E-03	0.0053
Arsenic	4.10E-04	2.28E-03	2.77E+00	12.12	2.28E-05	2.77E-02	0.1212
Beryllium	2.10E-05	1.17E-04	1.42E-01	0.62	1.17E-06	1.42E-03	0.0062
Cadmium	5.10E-05	2.83E-04	3.44E-01	1.51	2.83E-06	3.44E-03	0.0151
Chromium	2.60E-04	1.44E-03	1.76E+00	7.69	1.44E-05	1.76E-02	0.0769
Chromium (VI)	7.90E-05	4.39E-04	5.33E-01	2.34	4.39E-06	5.33E-03	0.0234
Cobalt	1.00E-04	5.56E-04	6.75E-01	2.96	5.56E-06	6.75E-03	0.0296
Lead	4.20E-04	2.33E-03	2.84E+00	12.42	2.33E-05	2.84E-02	0.1242
Manganese	4.90E-04	2.72E-03	3.31E+00	14.49	2.72E-05	3.31E-02	0.1449
Nickel	2.80E-04	1.56E-03	1.89E+00	8.28	1.56E-05	1.89E-02	0.0828
Selenium	1.30E-03	7.22E-03	8.78E+00	38.43	7.22E-05	8.78E-02	0.3843
mercury	8.30E-05	4.61E-04	5.60E-01	2.45	4.61E-06	5.60E-03	0.0245
	Inorganic Solid HAPs Sub-Total		**23.71**	**103.83**		**0.24**	**1.04**

		Uncontrolled			Controlled		
Inorganic Acid Gas HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**
HF	0.15	5.83E-04	7.09E-01	3.1043	5.83E-04	7.09E-01	3.1043
HCl	1.2	4.67E-03	5.67E+00	24.8346	4.67E-03	5.67E+00	24.8346
	Inorganic Acid Gases Sub-Total		**6.38**	**27.94**		**6.38**	**27.94**

		Uncontrolled			Controlled		
Organic HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**
Total PCDD/PCDF	2.44E-07	1.36E-08	1.65E-05	0.0001	1.36E-08	1.65E-05	0.0001
Biphenyl	1.70E-06	9.44E-08	1.15E-04	0.0005	9.44E-08	1.15E-04	0.0005
Acenaphthene	5.10E-07	2.83E-08	3.44E-05	0.0002	2.83E-08	3.44E-05	0.0002
Acenaphthylene	2.50E-07	1.39E-08	1.69E-05	0.0001	1.39E-08	1.69E-05	0.0001
Anthracene	2.10E-07	1.17E-08	1.42E-05	0.0001	1.17E-08	1.42E-05	0.0001
Benzo(a)anthracene	8.00E-08	4.44E-09	5.40E-06	0.0000	4.44E-09	5.40E-06	0.0000
Benzo(a)pyrene	3.80E-08	2.11E-09	2.57E-06	0.0000	2.11E-09	2.57E-06	0.0000
Benzo(b,j,k)fluoranthene	1.10E-07	6.11E-09	7.43E-06	0.0000	6.11E-09	7.43E-06	0.0000
Benzo(g,h,i)perylene	2.70E-08	1.50E-09	1.82E-06	0.0000	1.50E-09	1.82E-06	0.0000
Chrysene	1.00E-07	5.56E-09	6.75E-06	0.0000	5.56E-09	6.75E-06	0.0000
Fluoranthene	7.10E-07	3.94E-08	4.79E-05	0.0002	3.94E-08	4.79E-05	0.0002
Fluorene	9.10E-07	5.06E-08	6.14E-05	0.0003	5.06E-08	6.14E-05	0.0003
Indeno(1,2,3-cd)pyrene	6.10E-08	3.39E-09	4.12E-06	0.0000	3.39E-09	4.12E-06	0.0000
Naphthalene	1.30E-05	7.22E-07	8.78E-04	0.0038	7.22E-07	8.78E-04	0.0038
Phenanthrene	2.70E-06	1.50E-07	1.82E-04	0.0008	1.50E-07	1.82E-04	0.0008
Pyrene	3.30E-07	1.83E-08	2.23E-05	0.0001	1.83E-08	2.23E-05	0.0001
5-Methyl chrysene	2.20E-08	1.22E-09	1.49E-06	0.0000	1.22E-09	1.49E-06	0.0000
Acetaldhyde	5.70E-04	3.17E-05	3.85E-02	0.1685	3.17E-05	3.85E-02	0.1685
Acetophenone	1.50E-05	8.33E-07	1.01E-03	0.0044	8.33E-07	1.01E-03	0.0044
Acrolein	2.90E-04	1.61E-05	1.96E-02	0.0857	1.61E-05	1.96E-02	0.0857
Benzene	1.30E-03	7.22E-05	8.78E-02	0.3843	7.22E-05	8.78E-02	0.3843
Benzyl chloride	7.00E-04	3.89E-05	4.73E-02	0.2070	3.89E-05	4.73E-02	0.2070
Bis(2-ethylhexyl)phthalate	7.30E-05	4.06E-06	4.93E-03	0.0216	4.06E-06	4.93E-03	0.0216
Bromoform	3.90E-05	2.17E-06	2.63E-03	0.0115	2.17E-06	2.63E-03	0.0115
Carbon disulfide	1.30E-04	7.22E-06	8.78E-03	0.0384	7.22E-06	8.78E-03	0.0384
2-Chloroacetophenone	7.00E-06	3.89E-07	4.73E-04	0.0021	3.89E-07	4.73E-04	0.0021
Chlorobenzene	2.20E-05	1.22E-06	1.49E-03	0.0065	1.22E-06	1.49E-03	0.0065
Chloroform	5.90E-05	3.28E-06	3.98E-03	0.0174	3.28E-06	3.98E-03	0.0174
Cumene	5.30E-06	2.94E-07	3.58E-04	0.0016	2.94E-07	3.58E-04	0.0016
Cyanide	2.50E-03	1.39E-04	1.69E-01	0.7391	1.39E-04	1.69E-01	0.7391
2,4-Dinitrotoluene	2.80E-07	1.56E-08	1.89E-05	0.0001	1.56E-08	1.89E-05	0.0001
Dimethyl sulfate	4.80E-05	2.67E-06	3.24E-03	0.0142	2.67E-06	3.24E-03	0.0142
Ethyl benzene	9.40E-05	5.22E-06	6.35E-03	0.0278	5.22E-06	6.35E-03	0.0278
Ethyl chloride	4.20E-05	2.33E-06	2.84E-03	0.0124	2.33E-06	2.84E-03	0.0124
Ethylene dichloride	4.00E-05	2.22E-06	2.70E-03	0.0118	2.22E-06	2.70E-03	0.0118
Ethylene dibromide	1.20E-06	6.67E-08	8.10E-05	0.0004	6.67E-08	8.10E-05	0.0004
Formaldehyde	2.40E-04	1.33E-05	1.62E-02	0.0710	1.33E-05	1.62E-02	0.0710
Hexane	6.70E-05	3.72E-06	4.52E-03	0.0198	3.72E-06	4.52E-03	0.0198
Isophorone	5.80E-04	3.22E-05	3.92E-02	0.1715	3.22E-05	3.92E-02	0.1715
Methyl bromide	1.60E-04	8.89E-06	1.08E-02	0.0473	8.89E-06	1.08E-02	0.0473
Methyl chloride	5.30E-04	2.94E-05	3.58E-02	0.1567	2.94E-05	3.58E-02	0.1567
Methyl ethyl ketone	3.90E-04	2.17E-05	2.63E-02	0.1153	2.17E-05	2.63E-02	0.1153
Methyl hydrazine	1.70E-04	9.44E-06	1.15E-02	0.0503	9.44E-06	1.15E-02	0.0503
Methyl methacrylate	2.00E-05	1.11E-06	1.35E-03	0.0059	1.11E-06	1.35E-03	0.0059
Methyl tert butyl ether	3.50E-05	1.94E-06	2.36E-03	0.0103	1.94E-06	2.36E-03	0.0103

Methylene chloride	2.90E-04	1.61E-05	1.96E-02	0.0857	1.61E-05	1.96E-02	0.0857
Phenol	1.60E-05	8.89E-07	1.08E-03	0.0047	8.89E-07	1.08E-03	0.0047
Propionaldehyde	3.80E-04	2.11E-05	2.57E-02	0.1123	2.11E-05	2.57E-02	0.1123
Tetrachloroethylene	4.30E-05	2.39E-06	2.90E-03	0.0127	2.39E-06	2.90E-03	0.0127
Toluene	2.40E-04	1.33E-05	1.62E-02	0.0710	1.33E-05	1.62E-02	0.0710
1,1,1-Trichloroethane	2.00E-05	1.11E-06	1.35E-03	0.0059	1.11E-06	1.35E-03	0.0059
Styrene	2.50E-05	1.39E-06	1.69E-03	0.0074	1.39E-06	1.69E-03	0.0074
Xylenes	3.70E-05	2.06E-06	2.50E-03	0.0109	2.06E-06	2.50E-03	0.0109
Vinyl acetate	7.60E-06	4.22E-07	5.13E-04	0.0022	4.22E-07	5.13E-04	0.0022
	Organic HAPs Sub-Total		**0.62**	**2.72**		**0.62**	**2.72**
						7.2373	31.6994

Notes:

1) Inorganic Solid HAPs emission factors based on USEPA AP-42, Table 1.1-18 "Emission Factors for Trace Metals from Controlled Coal Combustion."
2) Controlled Inorganic Solid HAPS emission estimates based on 99 percent control efficiency through the fabric filter.
3) Uncontrolled Inorganic Acid Gas HAPS emission estimates based on 93 percent control efficiency through the WFGD&Fabric Filter.
4) Organic HAPS emission factors based on USEPA AP-42, Table 1.1-12, 1.1-13, and 1.1-14 for PCDD/PCDF, PAHs, and Organic Compounds, respectively.
PCDD/PCDF = Polychlorinated Dibenzo-P-Dioxans/Polychlorinated Dibenzofurans.
PAH = Polynuclear Aromatic Hydrocarbons

Table A-1

NV Energy

Reid Gardner Unit 2

HAPs Emission Calculations

Emission Calculation

Basis:

Fuel Burn Rate	1,215	MBtu/h
Unit MW (net)	100	MW
Unit MW (gross)	120	MW
Hours of Operation	8,760	h/y
Fuel Heating Value	9,000	Btu/lb

		Uncontrolled			Controlled		
Inorganic Solid HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**
Antimony	1.80E-05	1.00E-04	1.22E-01	0.53	1.00E-06	1.22E-03	0.0053
Arsenic	4.10E-04	2.28E-03	2.77E+00	12.12	2.28E-05	2.77E-02	0.1212
Beryllium	2.10E-05	1.17E-04	1.42E-01	0.62	1.17E-06	1.42E-03	0.0062
Cadmium	5.10E-05	2.83E-04	3.44E-01	1.51	2.83E-06	3.44E-03	0.0151
Chromium	2.60E-04	1.44E-03	1.76E+00	7.69	1.44E-05	1.76E-02	0.0769
Chromium (VI)	7.90E-05	4.39E-04	5.33E-01	2.34	4.39E-06	5.33E-03	0.0234
Cobalt	1.00E-04	5.56E-04	6.75E-01	2.96	5.56E-06	6.75E-03	0.0296
Lead	4.20E-04	2.33E-03	2.84E+00	12.42	2.33E-05	2.84E-02	0.1242
Manganese	4.90E-04	2.72E-03	3.31E+00	14.49	2.72E-05	3.31E-02	0.1449
Nickel	2.80E-04	1.56E-03	1.89E+00	8.28	1.56E-05	1.89E-02	0.0828
Selenium	1.30E-03	7.22E-03	8.78E+00	38.43	7.22E-05	8.78E-02	0.3843
mercury	8.30E-05	4.61E-04	5.60E-01	2.45	4.61E-06	5.60E-03	0.0245
Inorganic Solid HAPs Sub-Total			**23.71**	**103.83**		**0.24**	**1.04**

		Uncontrolled			Controlled		
Inorganic Acid Gas HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**
HF	0.15	5.83E-04	7.09E-01	3.1043	5.83E-04	7.09E-01	3.1043
HCl	1.2	4.67E-03	5.67E+00	24.8346	4.67E-03	5.67E+00	24.8346
Inorganic Acid Gases Sub-Total			**6.38**	**27.94**		**6.38**	**27.94**

		Uncontrolled			Controlled		
Organic HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**
Total PCDD/PCDF	2.44E-07	1.36E-08	1.65E-05	0.0001	1.36E-08	1.65E-05	0.0001
Biphenyl	1.70E-06	9.44E-08	1.15E-04	0.0005	9.44E-08	1.15E-04	0.0005
Acenaphthene	5.10E-07	2.83E-08	3.44E-05	0.0002	2.83E-08	3.44E-05	0.0002
Acenaphthylene	2.50E-07	1.39E-08	1.69E-05	0.0001	1.39E-08	1.69E-05	0.0001
Anthracene	2.10E-07	1.17E-08	1.42E-05	0.0001	1.17E-08	1.42E-05	0.0001
Benzo(a)anthracene	8.00E-08	4.44E-09	5.40E-06	0.0000	4.44E-09	5.40E-06	0.0000
Benzo(a)pyrene	3.80E-08	2.11E-09	2.57E-06	0.0000	2.11E-09	2.57E-06	0.0000
Benzo(b,j,k)fluoranthene	1.10E-07	6.11E-09	7.43E-06	0.0000	6.11E-09	7.43E-06	0.0000
Benzo(g,h,i)perylene	2.70E-08	1.50E-09	1.82E-06	0.0000	1.50E-09	1.82E-06	0.0000
Chrysene	1.00E-07	5.56E-09	6.75E-06	0.0000	5.56E-09	6.75E-06	0.0000
Fluoranthene	7.10E-07	3.94E-08	4.79E-05	0.0002	3.94E-08	4.79E-05	0.0002
Fluorene	9.10E-07	5.06E-08	6.14E-05	0.0003	5.06E-08	6.14E-05	0.0003
Indeno(1,2,3-cd)pyrene	6.10E-08	3.39E-09	4.12E-06	0.0000	3.39E-09	4.12E-06	0.0000
Naphthalene	1.30E-05	7.22E-07	8.78E-04	0.0038	7.22E-07	8.78E-04	0.0038
Phenanthrene	2.70E-06	1.50E-07	1.82E-04	0.0008	1.50E-07	1.82E-04	0.0008
Pyrene	3.30E-07	1.83E-08	2.23E-05	0.0001	1.83E-08	2.23E-05	0.0001
5-Methyl chrysene	2.20E-08	1.22E-09	1.49E-06	0.0000	1.22E-09	1.49E-06	0.0000
Acetaldhyde	5.70E-04	3.17E-05	3.85E-02	0.1685	3.17E-05	3.85E-02	0.1685
Acetophenone	1.50E-05	8.33E-07	1.01E-03	0.0044	8.33E-07	1.01E-03	0.0044
Acrolein	2.90E-04	1.61E-05	1.96E-02	0.0857	1.61E-05	1.96E-02	0.0857
Benzene	1.30E-03	7.22E-05	8.78E-02	0.3843	7.22E-05	8.78E-02	0.3843
Benzyl chloride	7.00E-04	3.89E-05	4.73E-02	0.2070	3.89E-05	4.73E-02	0.2070
Bis(2-ethylhexyl)phthalate	7.30E-05	4.06E-06	4.93E-03	0.0216	4.06E-06	4.93E-03	0.0216
Bromoform	3.90E-05	2.17E-06	2.63E-03	0.0115	2.17E-06	2.63E-03	0.0115
Carbon disulfide	1.30E-04	7.22E-06	8.78E-03	0.0384	7.22E-06	8.78E-03	0.0384
2-Chloroacetophenone	7.00E-06	3.89E-07	4.73E-04	0.0021	3.89E-07	4.73E-04	0.0021
Chlorobenzene	2.20E-05	1.22E-06	1.49E-03	0.0065	1.22E-06	1.49E-03	0.0065
Chloroform	5.90E-05	3.28E-06	3.98E-03	0.0174	3.28E-06	3.98E-03	0.0174
Cumene	5.30E-06	2.94E-07	3.58E-04	0.0016	2.94E-07	3.58E-04	0.0016
Cyanide	2.50E-03	1.39E-04	1.69E-01	0.7391	1.39E-04	1.69E-01	0.7391
2,4-Dinitrotoluene	2.80E-07	1.56E-08	1.89E-05	0.0001	1.56E-08	1.89E-05	0.0001
Dimethyl sulfate	4.80E-05	2.67E-06	3.24E-03	0.0142	2.67E-06	3.24E-03	0.0142
Ethyl benzene	9.40E-05	5.22E-06	6.35E-03	0.0278	5.22E-06	6.35E-03	0.0278
Ethyl chloride	4.20E-05	2.33E-06	2.84E-03	0.0124	2.33E-06	2.84E-03	0.0124
Ethylene dichloride	4.00E-05	2.22E-06	2.70E-03	0.0118	2.22E-06	2.70E-03	0.0118
Ethylene dibromide	1.20E-06	6.67E-08	8.10E-05	0.0004	6.67E-08	8.10E-05	0.0004
Formaldehyde	2.40E-04	1.33E-05	1.62E-02	0.0710	1.33E-05	1.62E-02	0.0710
Hexane	6.70E-05	3.72E-06	4.52E-03	0.0198	3.72E-06	4.52E-03	0.0198
Isophorone	5.80E-04	3.22E-05	3.92E-02	0.1715	3.22E-05	3.92E-02	0.1715
Methyl bromide	1.60E-04	8.89E-06	1.08E-02	0.0473	8.89E-06	1.08E-02	0.0473
Methyl chloride	5.30E-04	2.94E-05	3.58E-02	0.1567	2.94E-05	3.58E-02	0.1567
Methyl ethyl ketone	3.90E-04	2.17E-05	2.63E-02	0.1153	2.17E-05	2.63E-02	0.1153
Methyl hydrazine	1.70E-04	9.44E-06	1.15E-02	0.0503	9.44E-06	1.15E-02	0.0503
Methyl methacrylate	2.00E-05	1.11E-06	1.35E-03	0.0059	1.11E-06	1.35E-03	0.0059
Methyl tert butyl ether	3.50E-05	1.94E-06	2.36E-03	0.0103	1.94E-06	2.36E-03	0.0103

Methylene chloride	2.90E-04	1.61E-05	1.96E-02	0.0857	1.61E-05	1.96E-02	0.0857
Phenol	1.60E-05	8.89E-07	1.08E-03	0.0047	8.89E-07	1.08E-03	0.0047
Propionaldehyde	3.80E-04	2.11E-05	2.57E-02	0.1123	2.11E-05	2.57E-02	0.1123
Tetrachloroethylene	4.30E-05	2.39E-06	2.90E-03	0.0127	2.39E-06	2.90E-03	0.0127
Toluene	2.40E-04	1.33E-05	1.62E-02	0.0710	1.33E-05	1.62E-02	0.0710
1,1,1-Trichloroethane	2.00E-05	1.11E-06	1.35E-03	0.0059	1.11E-06	1.35E-03	0.0059
Styrene	2.50E-05	1.39E-06	1.69E-03	0.0074	1.39E-06	1.69E-03	0.0074
Xylenes	3.70E-05	2.06E-06	2.50E-03	0.0109	2.06E-06	2.50E-03	0.0109
Vinyl acetate	7.60E-06	4.22E-07	5.13E-04	0.0022	4.22E-07	5.13E-04	0.0022
	Organic HAPs Sub-Total		**0.62**	**2.72**		**0.62**	**2.72**
						7.2373	31.6994

Notes:

1) Inorganic Solid HAPs emission factors based on USEPA AP-42, Table 1.1-18 "Emission Factors for Trace Metals from Controlled Coal Combustion."
2) Controlled Inorganic Solid HAPS emission estimates based on 99 percent control efficiency through the fabric filter.
3) Uncontrolled Inorganic Acid Gas HAPS emission estimates based on 93 percent control efficiency through the WFGD.
4) Organic HAPS emission factors based on USEPA AP-42, Table 1.1-12, 1.1-13, and 1.1-14 for PCDD/PCDF, PAHs, and Organic Compounds, respectively.
PCDD/PCDF = Polychlorinated Dibenzo-P-Dioxans/Polychlorinated Dibenzofurans.
PAH = Polynuclear Aromatic Hydrocarbons

Table A-1

NV Energy

Reid Gardner Unit 3

HAPs Emission Calculations

Emission Calculation

Basis:

Fuel Burn Rate	1,237	MBtu/h
Unit MW (net)	100	MW
Unit MW (gross)	120	MW
Hours of Operation	8,760	h/y
Fuel Heating Value	9,000	Btu/lb

		Uncontrolled			Controlled		
Inorganic Solid HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**
Antimony	1.80E-05	1.00E-04	1.24E-01	0.54	1.00E-06	1.24E-03	0.0054
Arsenic	4.10E-04	2.28E-03	2.82E+00	12.34	2.28E-05	2.82E-02	0.1234
Beryllium	2.10E-05	1.17E-04	1.44E-01	0.63	1.17E-06	1.44E-03	0.0063
Cadmium	5.10E-05	2.83E-04	3.50E-01	1.54	2.83E-06	3.50E-03	0.0154
Chromium	2.60E-04	1.44E-03	1.79E+00	7.83	1.44E-05	1.79E-02	0.0783
Chromium (VI)	7.90E-05	4.39E-04	5.43E-01	2.38	4.39E-06	5.43E-03	0.0238
Cobalt	1.00E-04	5.56E-04	6.87E-01	3.01	5.56E-06	6.87E-03	0.0301
Lead	4.20E-04	2.33E-03	2.89E+00	12.64	2.33E-05	2.89E-02	0.1264
Manganese	4.90E-04	2.72E-03	3.37E+00	14.75	2.72E-05	3.37E-02	0.1475
Nickel	2.80E-04	1.56E-03	1.92E+00	8.43	1.56E-05	1.92E-02	0.0843
Selenium	1.30E-03	7.22E-03	8.93E+00	39.13	7.22E-05	8.93E-02	0.3913
mercury	8.30E-05	4.61E-04	5.70E-01	2.50	4.61E-06	5.70E-03	0.0250
Inorganic Solid HAPs Sub-Total			**24.14**	**105.71**		**0.24**	**1.06**

		Uncontrolled			Controlled		
Inorganic Acid Gas HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**
HF	0.15	5.83E-04	7.22E-01	3.1605	5.83E-04	7.22E-01	3.1605
HCl	1.2	4.67E-03	5.77E+00	25.2843	4.67E-03	5.77E+00	25.2843
Inorganic Acid Gases Sub-Total			**6.49**	**28.44**		**6.49**	**28.44**

		Uncontrolled			Controlled		
Organic HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**
Total PCDD/PCDF	2.44E-07	1.36E-08	1.68E-05	0.0001	1.36E-08	1.68E-05	0.0001
Biphenyl	1.70E-06	9.44E-08	1.17E-04	0.0005	9.44E-08	1.17E-04	0.0005
Acenaphthene	5.10E-07	2.83E-08	3.50E-05	0.0002	2.83E-08	3.50E-05	0.0002
Acenaphthylene	2.50E-07	1.39E-08	1.72E-05	0.0001	1.39E-08	1.72E-05	0.0001
Anthracene	2.10E-07	1.17E-08	1.44E-05	0.0001	1.17E-08	1.44E-05	0.0001
Benzo(a)anthracene	8.00E-08	4.44E-09	5.50E-06	0.0000	4.44E-09	5.50E-06	0.0000
Benzo(a)pyrene	3.80E-08	2.11E-09	2.61E-06	0.0000	2.11E-09	2.61E-06	0.0000
Benzo(b,j,k)fluoranthene	1.10E-07	6.11E-09	7.56E-06	0.0000	6.11E-09	7.56E-06	0.0000
Benzo(g,h,i)perylene	2.70E-08	1.50E-09	1.86E-06	0.0000	1.50E-09	1.86E-06	0.0000
Chrysene	1.00E-07	5.56E-09	6.87E-06	0.0000	5.56E-09	6.87E-06	0.0000
Fluoranthene	7.10E-07	3.94E-08	4.88E-05	0.0002	3.94E-08	4.88E-05	0.0002
Fluorene	9.10E-07	5.06E-08	6.25E-05	0.0003	5.06E-08	6.25E-05	0.0003
Indeno(1,2,3-cd)pyrene	6.10E-08	3.39E-09	4.19E-06	0.0000	3.39E-09	4.19E-06	0.0000
Naphthalene	1.30E-05	7.22E-07	8.93E-04	0.0039	7.22E-07	8.93E-04	0.0039
Phenanthrene	2.70E-06	1.50E-07	1.86E-04	0.0008	1.50E-07	1.86E-04	0.0008
Pyrene	3.30E-07	1.83E-08	2.27E-05	0.0001	1.83E-08	2.27E-05	0.0001
5-Methyl chrysene	2.20E-08	1.22E-09	1.51E-06	0.0000	1.22E-09	1.51E-06	0.0000
Acetaldhyde	5.70E-04	3.17E-05	3.92E-02	0.1716	3.17E-05	3.92E-02	0.1716
Acetophenone	1.50E-05	8.33E-07	1.03E-03	0.0045	8.33E-07	1.03E-03	0.0045
Acrolein	2.90E-04	1.61E-05	1.99E-02	0.0873	1.61E-05	1.99E-02	0.0873
Benzene	1.30E-03	7.22E-05	8.93E-02	0.3913	7.22E-05	8.93E-02	0.3913
Benzyl chloride	7.00E-04	3.89E-05	4.81E-02	0.2107	3.89E-05	4.81E-02	0.2107
Bis(2-ethylhexyl)phthalate	7.30E-05	4.06E-06	5.02E-03	0.0220	4.06E-06	5.02E-03	0.0220
Bromoform	3.90E-05	2.17E-06	2.68E-03	0.0117	2.17E-06	2.68E-03	0.0117
Carbon disulfide	1.30E-04	7.22E-06	8.93E-03	0.0391	7.22E-06	8.93E-03	0.0391
2-Chloroacetophenone	7.00E-06	3.89E-07	4.81E-04	0.0021	3.89E-07	4.81E-04	0.0021
Chlorobenzene	2.20E-05	1.22E-06	1.51E-03	0.0066	1.22E-06	1.51E-03	0.0066
Chloroform	5.90E-05	3.28E-06	4.05E-03	0.0178	3.28E-06	4.05E-03	0.0178
Cumene	5.30E-06	2.94E-07	3.64E-04	0.0016	2.94E-07	3.64E-04	0.0016
Cyanide	2.50E-03	1.39E-04	1.72E-01	0.7525	1.39E-04	1.72E-01	0.7525
2,4-Dinitrotoluene	2.80E-07	1.56E-08	1.92E-05	0.0001	1.56E-08	1.92E-05	0.0001
Dimethyl sulfate	4.80E-05	2.67E-06	3.30E-03	0.0144	2.67E-06	3.30E-03	0.0144
Ethyl benzene	9.40E-05	5.22E-06	6.46E-03	0.0283	5.22E-06	6.46E-03	0.0283
Ethyl chloride	4.20E-05	2.33E-06	2.89E-03	0.0126	2.33E-06	2.89E-03	0.0126
Ethylene dichloride	4.00E-05	2.22E-06	2.75E-03	0.0120	2.22E-06	2.75E-03	0.0120
Ethylene dibromide	1.20E-06	6.67E-08	8.25E-05	0.0004	6.67E-08	8.25E-05	0.0004
Formaldehyde	2.40E-04	1.33E-05	1.65E-02	0.0722	1.33E-05	1.65E-02	0.0722
Hexane	6.70E-05	3.72E-06	4.60E-03	0.0202	3.72E-06	4.60E-03	0.0202
Isophorone	5.80E-04	3.22E-05	3.99E-02	0.1746	3.22E-05	3.99E-02	0.1746
Methyl bromide	1.60E-04	8.89E-06	1.10E-02	0.0482	8.89E-06	1.10E-02	0.0482
Methyl chloride	5.30E-04	2.94E-05	3.64E-02	0.1595	2.94E-05	3.64E-02	0.1595
Methyl ethyl ketone	3.90E-04	2.17E-05	2.68E-02	0.1174	2.17E-05	2.68E-02	0.1174
Methyl hydrazine	1.70E-04	9.44E-06	1.17E-02	0.0512	9.44E-06	1.17E-02	0.0512
Methyl methacrylate	2.00E-05	1.11E-06	1.37E-03	0.0060	1.11E-06	1.37E-03	0.0060
Methyl tert butyl ether	3.50E-05	1.94E-06	2.41E-03	0.0105	1.94E-06	2.41E-03	0.0105

Methylene chloride	2.90E-04	1.61E-05	1.99E-02	0.0873	1.61E-05	1.99E-02	0.0873
Phenol	1.60E-05	8.89E-07	1.10E-03	0.0048	8.89E-07	1.10E-03	0.0048
Propionaldehyde	3.80E-04	2.11E-05	2.61E-02	0.1144	2.11E-05	2.61E-02	0.1144
Tetrachloroethylene	4.30E-05	2.39E-06	2.96E-03	0.0129	2.39E-06	2.96E-03	0.0129
Toluene	2.40E-04	1.33E-05	1.65E-02	0.0722	1.33E-05	1.65E-02	0.0722
1,1,1-Trichloroethane	2.00E-05	1.11E-06	1.37E-03	0.0060	1.11E-06	1.37E-03	0.0060
Styrene	2.50E-05	1.39E-06	1.72E-03	0.0075	1.39E-06	1.72E-03	0.0075
Xylenes	3.70E-05	2.06E-06	2.54E-03	0.0111	2.06E-06	2.54E-03	0.0111
Vinyl acetate	7.60E-06	4.22E-07	5.22E-04	0.0023	4.22E-07	5.22E-04	0.0023
	Organic HAPs Sub-Total		**0.63**	**2.77**		**0.63**	**2.77**
						7.3684	32.2734

Notes:

1) Inorganic Solid HAPs emission factors based on USEPA AP-42, Table 1.1-18 "Emission Factors for Trace Metals from Controlled Coal Combustion."
2) Controlled Inorganic Solid HAPS emission estimates based on 99 percent control efficiency through the fabric filter.
3) Uncontrolled Inorganic Acid Gas HAPS emission estimates based on 93 percent control efficiency through the WFGD.
4) Organic HAPS emission factors based on USEPA AP-42, Table 1.1-12, 1.1-13, and 1.1-14 for PCDD/PCDF, PAHs, and Organic Compounds, respectively.
PCDD/PCDF = Polychlorinated Dibenzo-P-Dioxans/Polychlorinated Dibenzofurans.
PAH = Polynuclear Aromatic Hydrocarbons

Table A-1

NV Energy

Reid Gardner Unit 4

HAPs Emission Calculations

Emission Calculation

Basis:

Fuel Burn Rate	2,956	MBtu/h
Unit MW (net)	257	MW
Unit MW (gross)	280	MW
Hours of Operation	8,760	h/y
Fuel Heating Value	8,160	Btu/lb

		Uncontrolled			Controlled		
Inorganic Solid HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**
Antimony	1.80E-05	1.10E-04	3.26E-01	1.43	1.10E-06	3.26E-03	0.0143
Arsenic	4.10E-04	2.51E-03	7.43E+00	32.53	2.51E-05	7.43E-02	0.3253
Beryllium	2.10E-05	1.29E-04	3.80E-01	1.67	1.29E-06	3.80E-03	0.0167
Cadmium	5.10E-05	3.13E-04	9.24E-01	4.05	3.13E-06	9.24E-03	0.0405
Chromium	2.60E-04	1.59E-03	4.71E+00	20.63	1.59E-05	4.71E-02	0.2063
Chromium (VI)	7.90E-05	4.84E-04	1.43E+00	6.27	4.84E-06	1.43E-02	0.0627
Cobalt	1.00E-04	6.13E-04	1.81E+00	7.93	6.13E-06	1.81E-02	0.0793
Lead	4.20E-04	2.57E-03	7.61E+00	33.32	2.57E-05	7.61E-02	0.3332
Manganese	4.90E-04	3.00E-03	8.88E+00	38.87	3.00E-05	8.88E-02	0.3887
Nickel	2.80E-04	1.72E-03	5.07E+00	22.21	1.72E-05	5.07E-02	0.2221
Selenium	1.30E-03	7.97E-03	2.35E+01	103.13	7.97E-05	2.35E-01	1.0313
mercury	8.30E-05	5.09E-04	1.50E+00	6.58	5.09E-06	1.50E-02	0.0658
	Inorganic Solid HAPs Sub-Total		**63.61**	**278.62**		**0.64**	**2.79**

		Uncontrolled			Controlled		
Inorganic Acid Gas HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**
HF	0.15	6.43E-04	1.90E+00	8.3301	6.43E-04	1.90E+00	8.3301
HCl	1.2	5.15E-03	1.52E+01	66.6404	5.15E-03	1.52E+01	66.6404
	Inorganic Acid Gases Sub-Total		**17.12**	**74.97**		**17.12**	**74.97**

		Uncontrolled			Controlled		
Organic HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**	**Emissions (lb/MBtu)**	**Emissions (lb/h)**	**Emissions (tpy)**
Total PCDD/PCDF	2.44E-07	1.50E-08	4.42E-05	0.0002	1.50E-08	4.42E-05	0.0002
Biphenyl	1.70E-06	1.04E-07	3.08E-04	0.0013	1.04E-07	3.08E-04	0.0013
Acenaphthene	5.10E-07	3.13E-08	9.24E-05	0.0004	3.13E-08	9.24E-05	0.0004
Acenaphthylene	2.50E-07	1.53E-08	4.53E-05	0.0002	1.53E-08	4.53E-05	0.0002
Anthracene	2.10E-07	1.29E-08	3.80E-05	0.0002	1.29E-08	3.80E-05	0.0002
Benzo(a)anthracene	8.00E-08	4.90E-09	1.45E-05	0.0001	4.90E-09	1.45E-05	0.0001
Benzo(a)pyrene	3.80E-08	2.33E-09	6.88E-06	0.0000	2.33E-09	6.88E-06	0.0000
Benzo(b,j,k)fluoranthene	1.10E-07	6.74E-09	1.99E-05	0.0001	6.74E-09	1.99E-05	0.0001
Benzo(g,h,i)perylene	2.70E-08	1.65E-09	4.89E-06	0.0000	1.65E-09	4.89E-06	0.0000
Chrysene	1.00E-07	6.13E-09	1.81E-05	0.0001	6.13E-09	1.81E-05	0.0001
Fluoranthene	7.10E-07	4.35E-08	1.29E-04	0.0006	4.35E-08	1.29E-04	0.0006
Fluorene	9.10E-07	5.58E-08	1.65E-04	0.0007	5.58E-08	1.65E-04	0.0007
Indeno(1,2,3-cd)pyrene	6.10E-08	3.74E-09	1.10E-05	0.0000	3.74E-09	1.10E-05	0.0000
Naphthalene	1.30E-05	7.97E-07	2.35E-03	0.0103	7.97E-07	2.35E-03	0.0103
Phenanthrene	2.70E-06	1.65E-07	4.89E-04	0.0021	1.65E-07	4.89E-04	0.0021
Pyrene	3.30E-07	2.02E-08	5.98E-05	0.0003	2.02E-08	5.98E-05	0.0003
5-Methyl chrysene	2.20E-08	1.35E-09	3.98E-06	0.0000	1.35E-09	3.98E-06	0.0000
Acetaldhyde	5.70E-04	3.49E-05	1.03E-01	0.4522	3.49E-05	1.03E-01	0.4522
Acetophenone	1.50E-05	9.19E-07	2.72E-03	0.0119	9.19E-07	2.72E-03	0.0119
Acrolein	2.90E-04	1.78E-05	5.25E-02	0.2301	1.78E-05	5.25E-02	0.2301
Benzene	1.30E-03	7.97E-05	2.35E-01	1.0313	7.97E-05	2.35E-01	1.0313
Benzyl chloride	7.00E-04	4.29E-05	1.27E-01	0.5553	4.29E-05	1.27E-01	0.5553
Bis(2-ethylhexyl)phthalate	7.30E-05	4.47E-06	1.32E-02	0.0579	4.47E-06	1.32E-02	0.0579
Bromoform	3.90E-05	2.39E-06	7.06E-03	0.0309	2.39E-06	7.06E-03	0.0309
Carbon disulfide	1.30E-04	7.97E-06	2.35E-02	0.1031	7.97E-06	2.35E-02	0.1031
2-Chloroacetophenone	7.00E-06	4.29E-07	1.27E-03	0.0056	4.29E-07	1.27E-03	0.0056
Chlorobenzene	2.20E-05	1.35E-06	3.98E-03	0.0175	1.35E-06	3.98E-03	0.0175
Chloroform	5.90E-05	3.62E-06	1.07E-02	0.0468	3.62E-06	1.07E-02	0.0468
Cumene	5.30E-06	3.25E-07	9.60E-04	0.0042	3.25E-07	9.60E-04	0.0042
Cyanide	2.50E-03	1.53E-04	4.53E-01	1.9833	1.53E-04	4.53E-01	1.9833
2,4-Dinitrotoluene	2.80E-07	1.72E-08	5.07E-05	0.0002	1.72E-08	5.07E-05	0.0002
Dimethyl sulfate	4.80E-05	2.94E-06	8.69E-03	0.0381	2.94E-06	8.69E-03	0.0381
Ethyl benzene	9.40E-05	5.76E-06	1.70E-02	0.0746	5.76E-06	1.70E-02	0.0746
Ethyl chloride	4.20E-05	2.57E-06	7.61E-03	0.0333	2.57E-06	7.61E-03	0.0333
Ethylene dichloride	4.00E-05	2.45E-06	7.25E-03	0.0317	2.45E-06	7.25E-03	0.0317
Ethylene dibromide	1.20E-06	7.35E-08	2.17E-04	0.0010	7.35E-08	2.17E-04	0.0010
Formaldehyde	2.40E-04	1.47E-05	4.35E-02	0.1904	1.47E-05	4.35E-02	0.1904
Hexane	6.70E-05	4.11E-06	1.21E-02	0.0532	4.11E-06	1.21E-02	0.0532
Isophorone	5.80E-04	3.55E-05	1.05E-01	0.4601	3.55E-05	1.05E-01	0.4601
Methyl bromide	1.60E-04	9.80E-06	2.90E-02	0.1269	9.80E-06	2.90E-02	0.1269
Methyl chloride	5.30E-04	3.25E-05	9.60E-02	0.4205	3.25E-05	9.60E-02	0.4205
Methyl ethyl ketone	3.90E-04	2.39E-05	7.06E-02	0.3094	2.39E-05	7.06E-02	0.3094
Methyl hydrazine	1.70E-04	1.04E-05	3.08E-02	0.1349	1.04E-05	3.08E-02	0.1349
Methyl methacrylate	2.00E-05	1.23E-06	3.62E-03	0.0159	1.23E-06	3.62E-03	0.0159
Methyl tert butyl ether	3.50E-05	2.14E-06	6.34E-03	0.0278	2.14E-06	6.34E-03	0.0278

Methylene chloride	2.90E-04	1.78E-05	5.25E-02	0.2301	1.78E-05	5.25E-02	0.2301
Phenol	1.60E-05	9.80E-07	2.90E-03	0.0127	9.80E-07	2.90E-03	0.0127
Propionaldehyde	3.80E-04	2.33E-05	6.88E-02	0.3015	2.33E-05	6.88E-02	0.3015
Tetrachloroethylene	4.30E-05	2.63E-06	7.79E-03	0.0341	2.63E-06	7.79E-03	0.0341
Toluene	2.40E-04	1.47E-05	4.35E-02	0.1904	1.47E-05	4.35E-02	0.1904
1,1,1-Trichloroethane	2.00E-05	1.23E-06	3.62E-03	0.0159	1.23E-06	3.62E-03	0.0159
Styrene	2.50E-05	1.53E-06	4.53E-03	0.0198	1.53E-06	4.53E-03	0.0198
Xylenes	3.70E-05	2.27E-06	6.70E-03	0.0294	2.27E-06	6.70E-03	0.0294
Vinyl acetate	7.60E-06	4.66E-07	1.38E-03	0.0060	4.66E-07	1.38E-03	0.0060
	Organic HAPs Sub-Total		**1.67**	**7.30**		**1.67**	**7.30**
						19.4204	85.0612

Notes:

1) Inorganic Solid HAPs emission factors based on USEPA AP-42, Table 1.1-18 "Emission Factors for Trace Metals from Controlled Coal Combustion."
2) Controlled Inorganic Solid HAPS emission estimates based on 99 percent control efficiency through the fabric filter.
3) Uncontrolled Inorganic Acid Gas HAPS emission estimates based on 93 percent control efficiency through the WFGD.
4) Organic HAPS emission factors based on USEPA AP-42, Table 1.1-12, 1.1-13, and 1.1-14 for PCDD/PCDF, PAHs, and Organic Compounds, respectively.
PCDD/PCDF = Polychlorinated Dibenzo-P-Dioxans/Polychlorinated Dibenzofurans.
PAH = Polynuclear Aromatic Hydrocarbons

Table A-1
NV Energy

Reid Gardner Fire Pump
HAPs Emission Calculations

Emission Calculation

Basis:

Power Rating	400	HP
Heat Input		MMBtu/hr
Hours of Operation	8,760	hr/yr
Fuel Use		gal/hr

HAP	Emission factor (lb/MMBtu)	Source	Emission factor* (lb/hp-hr)	Emissions (lb/hr)	Emissions (ton/yr)
1,3 Butadiene	3.91E-05	AP-42 Table 3.3-2	2.74E-07	1.09E-04	4.80E-04
Acetaldehyde	7.67E-04	AP-42 Table 3.3-2	5.37E-06	2.15E-03	9.41E-03
Acrolein	9.25E-05	AP-42 Table 3.3-2	6.48E-07	2.59E-04	1.13E-03
Benzene	9.33E-04	AP-42 Table 3.3-2	6.53E-06	2.61E-03	1.14E-02
Formaldehyde	1.18E-03	AP-42 Table 3.3-2	8.26E-06	3.30E-03	1.45E-02
Naphthalene	8.48E-05	AP-42 Table 3.3-2	5.94E-07	2.37E-04	1.04E-03
Propylene	2.58E-03	AP-42 Table 3.3-2	1.81E-05	7.22E-03	3.16E-02
Toluene	4.09E-04	AP-42 Table 3.3-2	2.86E-06	1.15E-03	5.02E-03
Xylenes	2.85E-04	AP-42 Table 3.3-2	2.00E-06	7.98E-04	3.50E-03

* The lb/hp-hr emission factor was calculated based on the lb/MMBtu emission factor in AP-42 and a conversion factor of 7,000 Btu/hp-hr.

Table A-1

NV Energy

Reid Gardner Total Facility

HAPs Emission Calculations

Emission Calculation

Inorganic Solid HAPs	Emission Factor (lb/ton)	Emissions (lb/h)	Emissions (tpy)
Antimony	1.80E-05	6.93E-03	3.04E-02
Arsenic	4.10E-04	1.58E-01	6.91E-01
Beryllium	2.10E-05	8.09E-03	3.54E-02
Cadmium	5.10E-05	1.96E-02	8.60E-02
Chromium	2.60E-04	1.00E-01	4.39E-01
Chromium (VI)	7.90E-05	3.04E-02	1.33E-01
Cobalt	1.00E-04	3.85E-02	1.69E-01
Lead	4.20E-04	1.62E-01	7.08E-01
Manganese	4.90E-04	1.89E-01	8.27E-01
Nickel	2.80E-04	1.08E-01	4.72E-01
Selenium	1.30E-03	5.00E-01	2.19E+00
Mercury	8.30E-05	3.19E-02	1.40E-01
Inorganic Solid HAPs Sub-Total		**1.35**	**5.92**

		Controlled	
Inorganic Acid Gas HAPs	**Emission Factor (lb/ton)**	**Emissions (lb/h)**	**Emissions (tpy)**
HF		4.04E+00	1.77E+01
HCl		3.23E+01	1.42E+02
Inorganic Acid Gases Sub-Total		**36.37**	**159.29**

Organic HAPs	Emission Factor (lb/ton)	Emissions (lb/h)	Emissions (tpy)
Total PCDD/PCDF	2.44E-07	9.39E-05	4.11E-04
Biphenyl	1.70E-06	6.54E-04	2.87E-03
Acenaphthene	5.10E-07	1.96E-04	8.60E-04
Acenaphthylene	2.50E-07	9.62E-05	4.21E-04
Anthracene	2.10E-07	8.08E-05	3.54E-04
Benzo(a)anthracene	8.00E-08	3.08E-05	1.35E-04
Benzo(a)pyrene	3.80E-08	1.46E-05	6.41E-05
Benzo(b,j,k)fluoranthene	1.10E-07	4.23E-05	1.85E-04
Benzo(g,h,i)perylene	2.70E-08	1.04E-05	4.55E-05
Chrysene	1.00E-07	3.85E-05	1.69E-04
Fluoranthene	7.10E-07	2.73E-04	1.20E-03
Fluorene	9.10E-07	3.50E-04	1.53E-03
Indeno(1,2,3-cd)pyrene	6.10E-08	2.35E-05	1.03E-04
Naphthalene	1.30E-05	5.24E-03	2.30E-02
Phenanthrene	2.70E-06	1.04E-03	4.55E-03
Pyrene	3.30E-07	1.27E-04	5.56E-04
5-Methyl chrysene	2.20E-08	8.47E-06	3.71E-05
Acetaldhyde	5.70E-04	2.22E-01	9.70E-01
Acetophenone	1.50E-05	5.77E-03	2.53E-02
Acrolein	2.90E-04	1.12E-01	4.90E-01
Benzene	1.30E-03	5.03E-01	2.20E+00
Benzyl chloride	7.00E-04	2.69E-01	1.18E+00
Bis(2-ethylhexyl)phthalate	7.30E-05	2.81E-02	1.23E-01
Bromoform	3.90E-05	1.50E-02	6.57E-02
Carbon disulfide	1.30E-04	5.00E-02	2.19E-01
2-Chloroacetophenone	7.00E-06	2.69E-03	1.18E-02
Chlorobenzene	2.20E-05	8.47E-03	3.71E-02
Chloroform	5.90E-05	2.27E-02	9.95E-02
Cumene	5.30E-06	2.04E-03	8.93E-03
Cyanide	2.50E-03	9.62E-01	4.21E+00
2,4-Dinitrotoluene	2.80E-07	1.08E-04	4.72E-04
Dimethyl sulfate	4.80E-05	1.85E-02	8.09E-02
Ethyl benzene	9.40E-05	3.62E-02	1.58E-01
Ethyl chloride	4.20E-05	1.62E-02	7.08E-02
Ethylene dichloride	4.00E-05	1.54E-02	6.74E-02
Ethylene dibromide	1.20E-06	4.62E-04	2.02E-03

Formaldehyde	2.40E-04	9.57E-02	4.19E-01
Hexane	6.70E-05	2.58E-02	1.13E-01
Isophorone	5.80E-04	2.23E-01	9.78E-01
Methyl bromide	1.60E-04	6.16E-02	2.70E-01
Methyl chloride	5.30E-04	2.04E-01	8.93E-01
Methyl ethyl ketone	3.90E-04	1.50E-01	6.57E-01
Methyl hydrazine	1.70E-04	6.54E-02	2.87E-01
Methyl methacrylate	2.00E-05	7.70E-03	3.37E-02
Methyl tert butyl ether	3.50E-05	1.35E-02	5.90E-02
Methylene chloride	2.90E-04	1.12E-01	4.89E-01
Phenol	1.60E-05	6.16E-03	2.70E-02
Propionaldehyde	3.80E-04	1.46E-01	6.41E-01
Tetrachloroethylene	4.30E-05	1.65E-02	7.25E-02
Toluene	2.40E-04	9.35E-02	4.10E-01
1,1,1-Trichloroethane	2.00E-05	7.70E-03	3.37E-02
Styrene	2.50E-05	9.62E-03	4.21E-02
Xylenes	3.70E-05	1.50E-02	6.24E-02
Vinyl acetate	7.60E-06	2.92E-03	1.63E-02
1,3 Butadiene		1.09E-04	4.80E-04
Propylene		7.22E-03	3.16E-02
Chlorine		1.22E-03	5.08E-03
Organic HAPs Sub-Total		**3.56**	**15.60**

Reid Gardner Total Facility	**41.28**	**180.82**

Notes:

1) Inorganic Solid HAPs emission factors based on USEPA AP-42, Table 1.1-18 "Emission Factors for Trace Metals from Controlled Coal Combustion."
2) Controlled Inorganic Solid HAPS emission estimates based on 99 percent control efficiency through the fabric filter.
3) Uncontrolled Inorganic Acid Gas HAPS emission estimates based on 93 percent control efficiency through the WFGD&Fabric Filter.
4) Organic HAPS emission factors based on USEPA AP-42, Table 1.1-12, 1.1-13, and 1.1-14 for PCDD/PCDF, PAHs, and Organic Compounds, respectively.
PCDD/PCDF = Polychlorinated Dibenzo-P-Dioxans/Polychlorinated Dibenzofurans.
PAH = Polynuclear Aromatic Hydrocarbons
5) Organic HAP emission factors for the fire pump based on USEPA AP-42, Table 3.3-2. Factors given in lb/MMBtu.
6) HAP emission factors for coal handling based on Data source "Section 313 of the Emergency Planning and Community Right-to-Know Act Toxic Chemical Release Inve

COAL HANDLING - HAZARDOUS AIR POLLUTANT EMISSIONS

	Coal[1]	PM_{10}		Antimony 0.49 ppm		Arsenic 2.6 ppm		Beryllium 0.54 ppm		Cadmium 0.21 ppm		Chromium 6.1 ppm		Cobalt 1.9 ppm		Chlorine 118.3 ppm		Lead 3 ppm		Manganese 26 ppm		Mercury 0.130 ppm		Nickel 4.6 ppm		Selenium 1.10 ppm		Total HAPs	
Source ID	**Emissions Source Description**	lb/ hour	tons/ year	**lb/ hour**	**tons/ year**	**lb/ hour**	**tons/ year**	**lb/ hour**	**tons/ year**	**lb/ hour**	**tons/ year**	**lb/ hour**	**tons/ year**	**lb/ hour**	**tons/ year**	**lb/ hour**	**tons/ year**	**lb/ hour**	**tons/ year**	**lb/ hour**	**tons/ year**	**lb/ hour**	**tons/ year**	**lb/ hour**	**tons/ year**	**lb/ hour**	**tons/ year**	**lb/ hour**	**tons/ year**
Coal Unloading Station and Coal Conveying Equipment (PF1.001)																													
P1.001a	Coal train unloading station into the coal feed hoppers	0.13	0.06	6.4E-08	3.1E-08	3.4E-07	1.6E-07	7.1E-08	3.4E-08	2.7E-08	1.3E-08	8.0E-07	3.9E-07	2.5E-07	1.2E-07	1.5E-05	7.5E-06	3.9E-07	1.9E-07	3.4E-06	1.6E-06	1.7E-08	8.2E-09	6.0E-07	2.9E-07	1.4E-07	6.9E-08	2.2E-05	1.0E-05
P1.001b	Coal Transfer from Reclaim Conveyor A1 onto conveyor B	0.000	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
P1.001c	Coal Transfer from Reclaim Conveyor A2 onto conveyor B	0.000	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
P1.001d	Transfer of coal from conveyor B onto conveyors C or F	0.013	0.006	6.4E-09	3.1E-09	3.4E-08	1.6E-08	7.1E-09	3.4E-09	2.7E-09	1.3E-09	8.0E-08	3.9E-08	2.5E-08	1.2E-08	1.5E-06	7.5E-07	3.9E-08	1.9E-08	3.4E-07	1.6E-07	1.7E-09	8.2E-10	6.0E-08	2.9E-08	1.4E-08	6.9E-09	2.2E-06	1.0E-06
P1.001e	Transfer of coal from conveyor F onto conveyor G or N	0.013	0.006	6.4E-09	3.1E-09	3.4E-08	1.6E-08	7.1E-09	3.4E-09	2.7E-09	1.3E-09	8.0E-08	3.9E-08	2.5E-08	1.2E-08	1.5E-06	7.5E-07	3.9E-08	1.9E-08	3.4E-07	1.6E-07	1.7E-09	8.2E-10	6.0E-08	2.9E-08	1.4E-08	6.9E-09	2.2E-06	1.0E-06
P1.001g	Transfer of coal from conveyor C into reclaim stackout # 1	0.13	0.06	6.4E-08	3.1E-08	3.4E-07	1.6E-07	7.1E-08	3.4E-08	2.7E-08	1.3E-08	8.0E-07	3.9E-07	2.5E-07	1.2E-07	1.5E-05	7.5E-06	3.9E-07	1.9E-07	3.4E-06	1.6E-06	1.7E-08	8.2E-09	6.0E-07	2.9E-07	1.4E-07	6.9E-08	2.2E-05	1.0E-05
P1.001h	Transfer of coal from conveyor G into reclaim stackout # 2	0.13	0.06	6.4E-08	3.1E-08	3.4E-07	1.6E-07	7.1E-08	3.4E-08	2.7E-08	1.3E-08	8.0E-07	3.9E-07	2.5E-07	1.2E-07	1.5E-05	7.5E-06	3.9E-07	1.9E-07	3.4E-06	1.6E-06	1.7E-08	8.2E-09	6.0E-07	2.9E-07	1.4E-07	6.9E-08	2.2E-05	1.0E-05
P1.001i	Transfer of coal from conveyor N onto Reclaim stockout pile # 3	0.13	0.06	6.4E-08	3.1E-08	3.4E-07	1.6E-07	7.1E-08	3.4E-08	2.7E-08	1.3E-08	8.0E-07	3.9E-07	2.5E-07	1.2E-07	1.5E-05	7.5E-06	3.9E-07	1.9E-07	3.4E-06	1.6E-06	1.7E-08	8.2E-09	6.0E-07	2.9E-07	1.4E-07	6.9E-08	2.2E-05	1.0E-05
P1.001q	Inactive Coal Storage Pile	0.01	0.04	4.0E-09	1.7E-08	2.1E-08	9.2E-08	4.4E-09	1.9E-08	1.7E-09	7.4E-09	4.9E-08	2.2E-07	1.5E-08	6.7E-08	9.6E-07	4.2E-06	2.4E-08	1.1E-07	2.1E-07	9.2E-07	1.1E-09	4.6E-09	3.7E-08	1.6E-07	8.9E-09	3.9E-08	1.3E-06	5.8E-06
P1.001p	Active Coal Storage Pile	0.02	0.10	1.1E-08	4.8E-08	5.8E-08	2.5E-07	1.2E-08	5.3E-08	4.7E-09	2.0E-08	1.4E-07	5.9E-07	4.2E-08	1.9E-07	2.6E-06	1.2E-05	6.7E-08	2.9E-07	5.8E-07	2.5E-06	2.9E-09	1.3E-08	1.0E-07	4.5E-07	2.4E-08	1.1E-07	3.7E-06	1.6E-05
P1.001p	Active Coal Storage Pile	3.27	14.31	1.6E-06	7.0E-06	8.5E-06	3.7E-05	1.8E-06	7.7E-06	6.9E-07	3.0E-06	2.0E-05	8.7E-05	6.2E-06	2.7E-05	3.9E-04	1.7E-03	9.8E-06	4.3E-05	8.5E-05	3.7E-04	4.2E-07	1.9E-06	1.5E-05	6.6E-05	3.6E-06	1.6E-05	5.4E-04	2.4E-03
	PF1.001 Total	**3.85**	**14.71**	**1.9E-06**	**7.2E-06**	**1.0E-05**	**3.8E-05**	**2.1E-06**	**7.9E-06**	**8.1E-07**	**3.1E-06**	**2.3E-05**	**9.0E-05**	**7.3E-06**	**2.8E-05**	**4.6E-04**	**1.7E-03**	**1.2E-05**	**4.4E-05**	**1.0E-04**	**3.8E-04**	**5.0E-07**	**1.9E-06**	**1.8E-05**	**6.8E-05**	**4.2E-06**	**1.6E-05**	**6.3E-04**	**2.4E-03**
Unit 4 Coal Unloading Station and Coal Conveying Equipment (PF1.002)																													
P1.002i	Transfer of coal from reclaim pile onto conveyors O-1 and O-2	0.000	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
P1.002j	Transfer of coal from conveyors O-1 and O-2 onto Conveyor P-1 and P-2	0.007	0.003	3.6E-09	1.4E-09	1.9E-08	7.3E-09	4.0E-09	1.5E-09	1.5E-09	5.9E-10	4.5E-08	1.7E-08	1.4E-08	5.4E-09	8.7E-07	3.3E-07	2.2E-08	8.5E-09	1.9E-07	7.3E-08	9.5E-10	3.7E-10	3.4E-08	1.3E-08	8.0E-09	3.1E-09	1.2E-06	4.7E-07
TBD	Single emission point for Engart O.	1.142	5.001	5.6E-07	2.5E-06	3.0E-06	1.3E-05	6.2E-07	2.7E-06	2.4E-07	1.1E-06	7.0E-06	3.1E-05	2.2E-06	9.5E-06	1.4E-04	5.9E-04	3.4E-06	1.5E-05	3.0E-05	1.3E-04	1.5E-07	6.5E-07	5.3E-06	2.3E-05	1.3E-06	5.5E-06	1.9E-04	8.2E-04
P1.002e	Active Coal Storage Pile	0.08	0.36	4.0E-08	1.7E-07	2.1E-07	9.3E-07	4.4E-08	1.9E-07	1.7E-08	7.5E-08	5.0E-07	2.2E-06	1.5E-07	6.8E-07	9.6E-06	4.2E-05	2.4E-07	1.1E-06	2.1E-06	9.3E-06	1.1E-08	4.6E-08	3.7E-07	1.6E-06	9.0E-08	3.9E-07	1.3E-05	5.9E-05
P1.002f	Inactive Coal Storage Pile	0.00	0.02	2.1E-09	9.0E-09	1.1E-08	4.8E-08	2.3E-09	9.9E-09	8.8E-10	3.9E-09	2.6E-08	1.1E-07	8.0E-09	3.5E-08	5.0E-07	2.2E-06	1.3E-08	5.5E-08	1.1E-07	4.8E-07	5.5E-10	2.4E-09	1.9E-08	8.4E-08	4.6E-09	2.0E-08	6.9E-07	3.0E-06
	PF1.002 Total	**1.23**	**5.38**	**6.0E-07**	**2.6E-06**	**3.2E-06**	**1.4E-05**	**6.7E-07**	**2.9E-06**	**2.6E-07**	**1.1E-06**	**7.5E-06**	**3.3E-05**	**2.3E-06**	**1.0E-05**	**1.5E-04**	**6.4E-04**	**3.7E-06**	**1.6E-05**	**3.2E-05**	**1.4E-04**	**1.6E-07**	**7.0E-07**	**5.7E-06**	**2.5E-05**	**1.4E-06**	**5.9E-06**	**2.0E-04**	**8.9E-04**

Coal Silos - Loading and Unloading (S2.010, PF1.003, S2.011, PF1.004)																													
S2.010	Conveyor D to Conveyor E, Conveyor J to Conveyor M and K, and Unit 1-3 Loading	1.35	5.904	6.6E-07	2.9E-06	3.5E-06	1.5E-05	7.3E-07	3.2E-06	2.8E-07	1.2E-06	8.2E-06	3.6E-05	2.6E-06	1.1E-05	1.6E-04	7.0E-04	4.0E-06	1.8E-05	3.5E-05	1.5E-04	1.8E-07	7.7E-07	6.2E-06	2.7E-05	1.5E-06	6.5E-06	2.2E-04	9.7E-04
S2.011	Unit 4 Loading into the Coal Silos - Engart 4a and 4b single emission point	1.09	4.758	5.3E-07	2.3E-06	2.8E-06	1.2E-05	5.9E-07	2.6E-06	2.3E-07	1.0E-06	6.6E-06	2.9E-05	2.1E-06	9.0E-06	1.3E-04	5.6E-04	3.3E-06	1.4E-05	2.8E-05	1.2E-04	1.4E-07	6.2E-07	5.0E-06	2.2E-05	1.2E-06	5.2E-06	1.8E-04	7.8E-04
	S2.010/S2.011/ PF1.003/PF1.004 Total	**3.67**	**16.06**	**1.8E-06**	**7.9E-06**	**9.5E-06**	**4.2E-05**	**2.0E-06**	**8.7E-06**	**7.7E-07**	**3.4E-06**	**2.2E-05**	**9.8E-05**	**7.0E-06**	**3.1E-05**	**4.3E-04**	**1.9E-03**	**1.1E-05**	**4.8E-05**	**9.5E-05**	**4.2E-04**	**4.8E-07**	**2.1E-06**	**1.7E-05**	**7.4E-05**	**4.0E-06**	**1.8E-05**	**6.1E-04**	**2.6E-03**
Units 1-3 Coal Conveying System																													
TBD	Transfer of coal from bottom of the stockout pile # 1 onto conveyor D	0.00	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TBD	Transfer of coal from bottom of the stockout pile # 2 onto conveyor H	0.00	0.00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
TBD	Transfer of coal from Feeder D onto Conveyor E - Engart emission point	0.41	1.806	2.0E-07	8.8E-07	1.1E-06	4.7E-06	2.2E-07	9.8E-07	8.7E-08	3.8E-07	2.5E-06	1.1E-05	7.8E-07	3.4E-06	4.9E-05	2.1E-04	1.2E-06	5.4E-06	1.1E-05	4.7E-05	5.4E-08	2.3E-07	1.9E-06	8.3E-06	4.5E-07	2.0E-06	6.8E-05	3.0E-04
TBD	Transfer of coal from Feeder H1/H2 onto Conveyor H and Conveyor H onto J -	1.14	5.001	5.6E-07	2.5E-06	3.0E-06	1.3E-05	6.2E-07	2.7E-06	2.4E-07	1.1E-06	7.0E-06	3.1E-05	2.2E-06	9.5E-06	1.4E-04	5.9E-04	3.4E-06	1.5E-05	3.0E-05	1.3E-04	1.5E-07	6.5E-07	5.3E-06	2.3E-05	1.3E-06	5.5E-06	1.9E-04	8.2E-04
Unit 1-3 Coal Conveying Total		**1.55**	**6.81**	**7.6E-07**	**3.3E-06**	**4.0E-06**	**1.8E-05**	**8.4E-07**	**3.7E-06**	**3.3E-07**	**1.4E-06**	**9.5E-06**	**4.2E-05**	**3.0E-06**	**1.3E-05**	**1.8E-04**	**8.1E-04**	**4.7E-06**	**2.0E-05**	**4.0E-05**	**1.8E-04**	**2.0E-07**	**8.8E-07**	**7.1E-06**	**3.1E-05**	**1.7E-06**	**7.5E-06**	**2.6E-04**	**1.1E-03**

	Antimony		Arsenic		Beryllium		Cadmium		Chromium		Cobalt		Chlorine		Lead		Manganese		Mercury		Nickel		Selenium		Total HAPs	
	lb/ hour	tons/ year	lb/ hour	tons/ year	lb/ hour	tons/ year	lb/ hour	tons/ year	lb/ hour	tons/ year	lb/ hour	tons/ year	lb/ hour	tons/ year	lb/ hour	tons/ year	lb/ hour	tons/ year	lb/ hour	tons/ year	lb/ hour	tons/ year	lb/ hour	tons/ year	lb/ hour	tons/ year
TOTAL COAL HANDLING EMISSIONS	**5.1E-06**	**2.1E-05**	**2.7E-05**	**1.1E-04**	**5.6E-06**	**2.3E-05**	**2.2E-06**	**9.0E-06**	**6.3E-05**	**2.6E-04**	**2.0E-05**	**8.2E-05**	**1.2E-03**	**5.1E-03**	**3.1E-05**	**1.3E-04**	**2.7E-04**	**1.1E-03**	**1.3E-06**	**5.6E-06**	**4.7E-05**	**2.0E-04**	**1.1E-05**	**4.7E-05**	**1.7E-03**	**7.1E-03**

Notes:

Data source "Section 313 of the Emergency Planning and Community Right-to-Know Act Toxic Chemical Release Inventory Electric Generating Facilities" EPA 745-B-00-004

Appendix 7

EMISSIONS CAP

Please Attach Emission Cap Information

☒ **Please Check if not applicable**

Appendix 8

NARRATIVE DESCRIPTION

-

PROCESS FLOW DIAGRAMS

-

PLOT PLAN

-

MAPS

-

SPECIFICATION SHEETS

-

DUST CONTROL PLAN

-

2008 RENEWAL DOCUMENTAION

NARRATIVE DESCRIPTION

Narrative Description

Below is a general facility description. Following the general facility description is a summary of operational updates for the facility. These updates include corrections to the original permit. Many corrections do not reflect a change in operations. The correction is to better describe the actual, continued operation of the facility.

Reid Gardner is a fossil-fuel-fired electric generating facility located in Moapa, Nevada approximately 50 miles north of the city of Las Vegas. The Reid Gardner Station is classified as a major source for NO_X, CO, SO2, VOCs, and PM_{10} under the unitary permitting regulations of 40 CFR 70.2. The site consists of four external combustion boilers that serve to produce electricity for sale as the sole function of the installation. As such, all generating and support processes at the site are grouped under SIC code 4911. The electrical generation process is supported by the operation of several interactive on-site components comprised of fuel storage and transfer systems, water treatment and processing systems (ponds, purification equipment, cooling towers, etc.), and administrative/support facilities.

Coal, consisting of PRB, bituminous and sub-bituminous, is shipped to Reid Gardner Station by rail from mines located in Utah and Wyoming. The cars are unloaded through bottom dumps into dump hoppers located beneath coal yard ground level. The coal is then distributed via conveyors to the stockpile for Units #1-3 or the stockpile for Unit # 4 where the coal is stored while awaiting combustion. When needed, the coal is bulldozed into feed hoppers at ground level to be fed into a pre-combustion processing operation.

Coal is conveyed from the stockpile utilizing closed conveyors and water spray dust suppression to the coal storage silos. The coal passes from the silos into the crushing processes. The crushing processes are enclosed and do not vent to atmosphere. The crushing devices are referred to as ball mills and they are used to reduce the size of the coal particles to the point where they are refined down to powder suitable for efficient combustion.

After pulverization, the powdered coal/air is blown to the burner decks where it is injected into the boiler. The heat of combustion produces steam within the various boiler tubes lining the firebox portion of the boiler. Steam is piped to a turbine generator where the thermal energy is converted to mechanical energy as the steam turns the turbine blades that rotate the turbine shaft. The motion of the turbine shaft directly coupled to an electrical generator produces an electrical current for transmission.

By products of the combustion process, flue gas and fly ash enter a baghouse, where the flue gas is filtered through inverted bags. These bag filters remove 99% of the entrained particulate matter. The ash collected is sequentially dropped into hoppers where it is pneumatically transported to the fly ash silo and trucked to the fly ash landfill near the site.

Bottom ash that is too heavy to remain entrained in the gas stream is handled via bottom hoppers. Large pieces are crushed with internal crushers located inside the boiler just above the bottom hoppers. From the bottom hoppers, the bottom ash is transferred pneumatically to the fly ash silo.

After a large percentage of the ash is removed, the gases proceed into the wet scrubber. The scrubber removes pollutants by passing the gases upward through a rain of a mildly caustic solution of soda ash and water. The soda ash and water mixture removes sulfur dioxide and

particulate matter by droplet impingement. This mixture is repeatedly circulated until saturated. At saturation, it is piped into temporary storage tanks that hold the solution until it can be pumped to the wastewater ponds near the site.

The Reid Gardner Facility has additional emissions units that are used to support the coal fired boilers. There are small electrical generating sets for emergency electrical power.

PROCESS FLOW DIAGRAMS

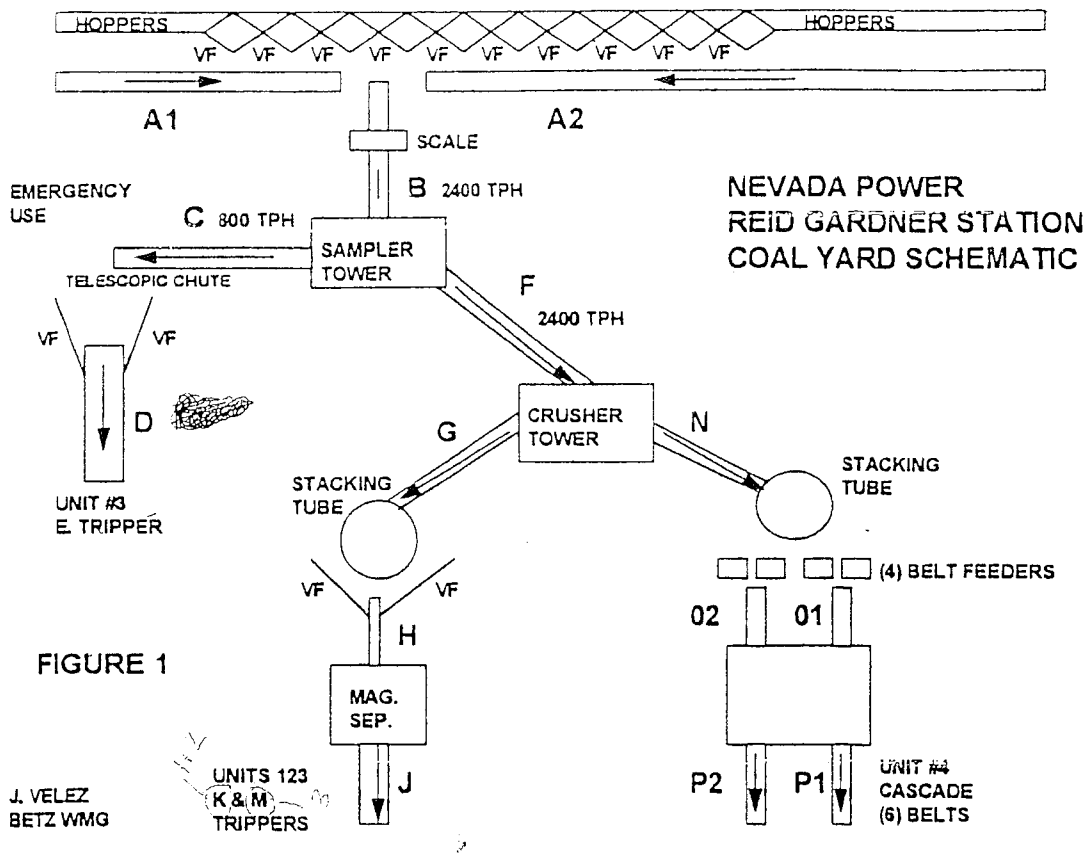
HOPPERS
HOPPERS
VF VF VF VF VF VF VF VF VF VF
A1
A2
SCALE
B 2400 TPH
EMERGENCY USE
C 800 TPH
SAMPLER TOWER
TELESCOPIC CHUTE
F
2400 TPH
VF
VF
D
UNIT #3
E. TRIPPER
CRUSHER TOWER
G
N
STACKING TUBE
STACKING TUBE
(4) BELT FEEDERS
VF
VF
H
02
01
MAG. SEP.
J
P2
P1
UNIT #4
CASCADE
(6) BELTS
UNITS 123
K & M
TRIPPERS
J. VELEZ
BETZ WMG
NEVADA POWER
REID GARDNER STATION
COAL YARD SCHEMATIC

FIGURE 1

D H

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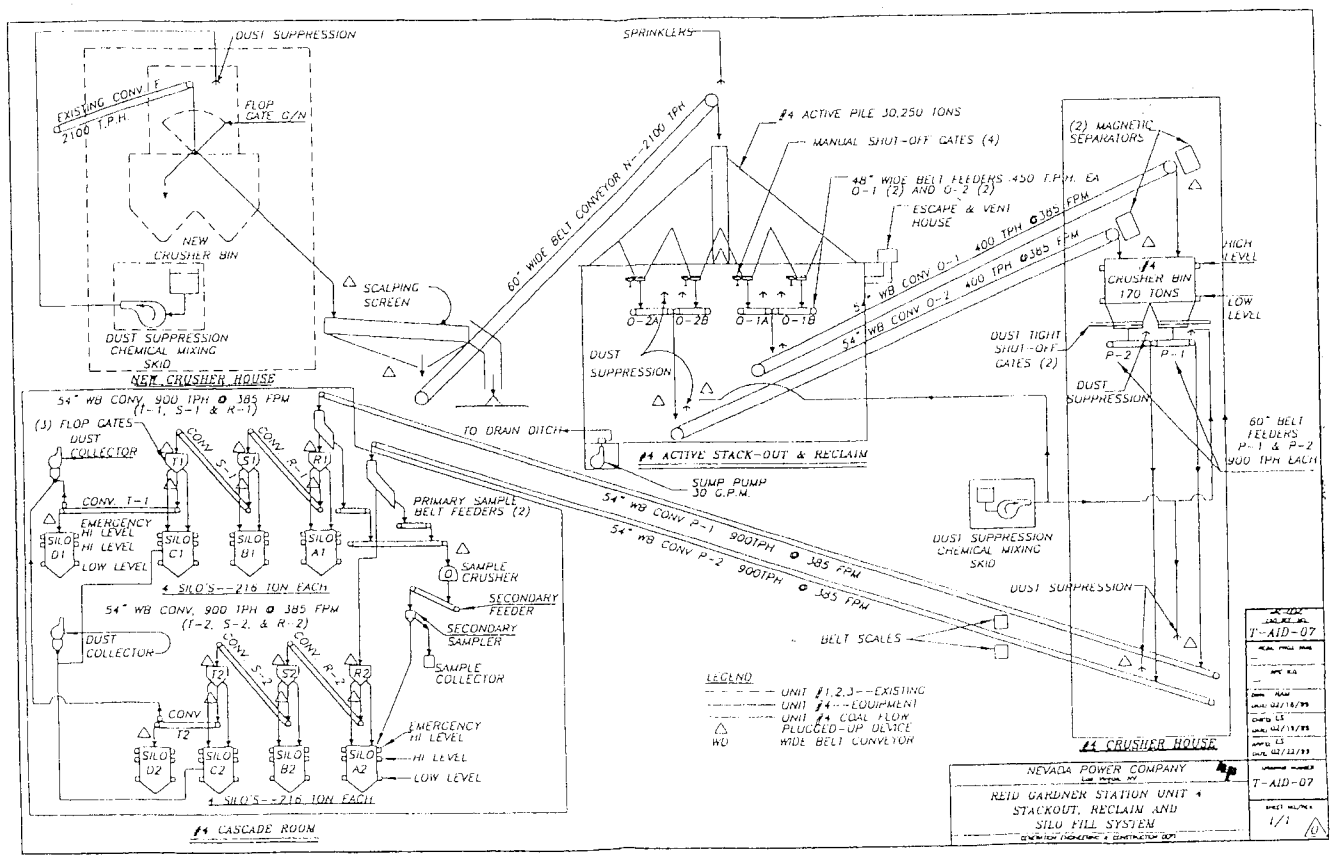
To Jeff Robb		From Terry Gerrick	# of pages ▸ 2
Co.		Co.	
Dept.		Phone #	
Fax # 576-1555		Fax #	



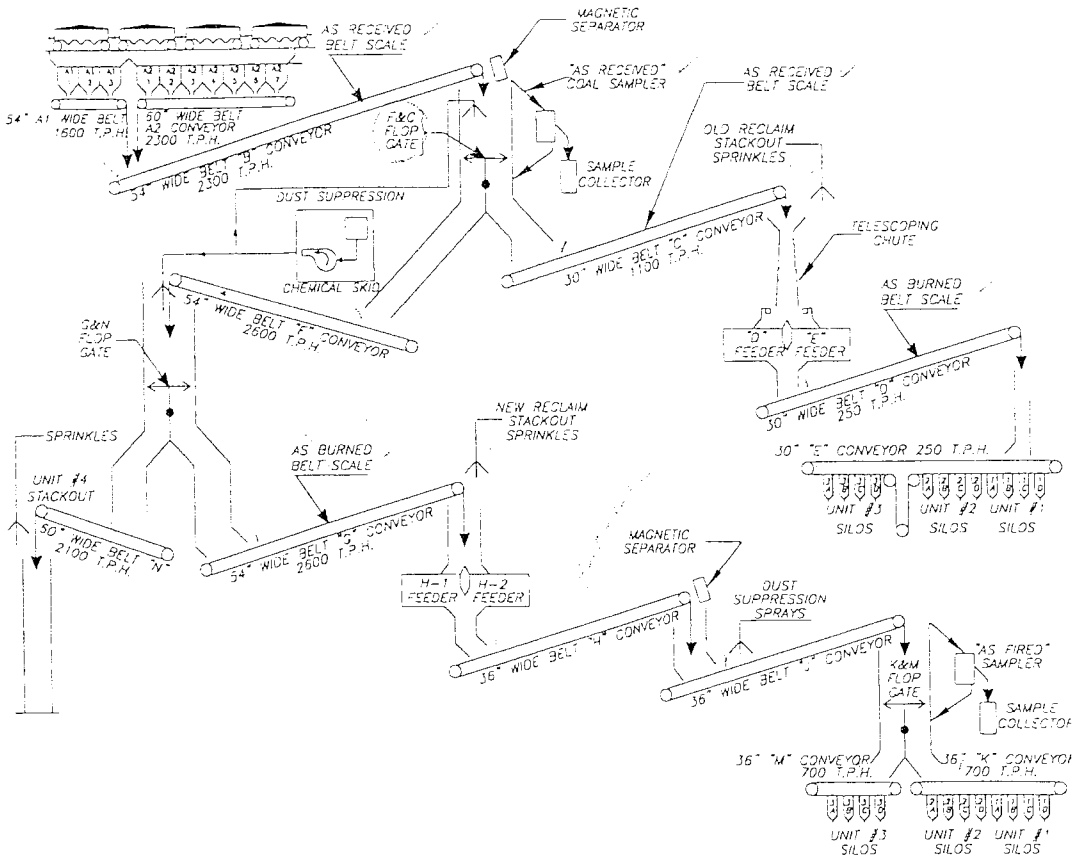


Figure 1.2 Coal Unloading, Old/New Reclaim

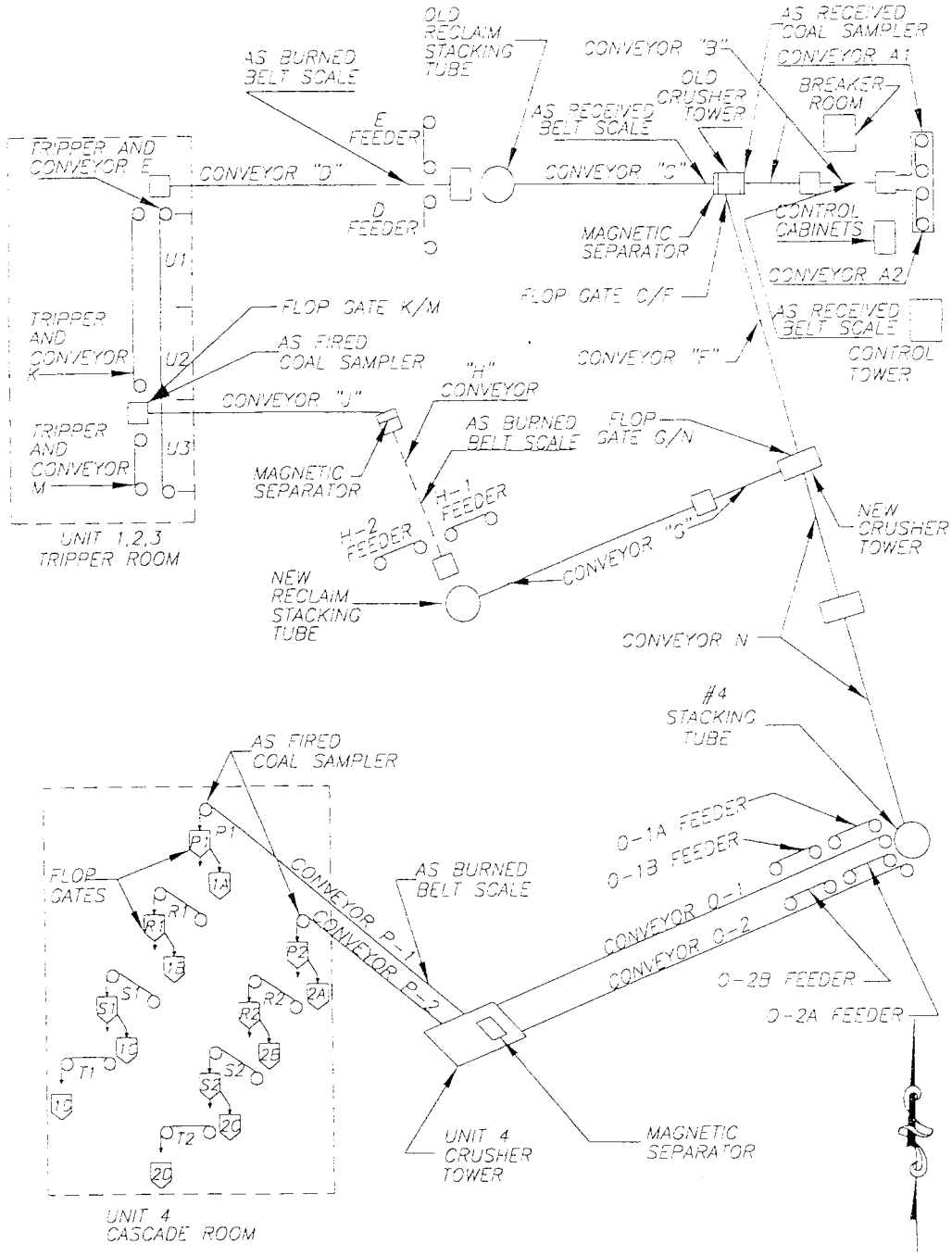
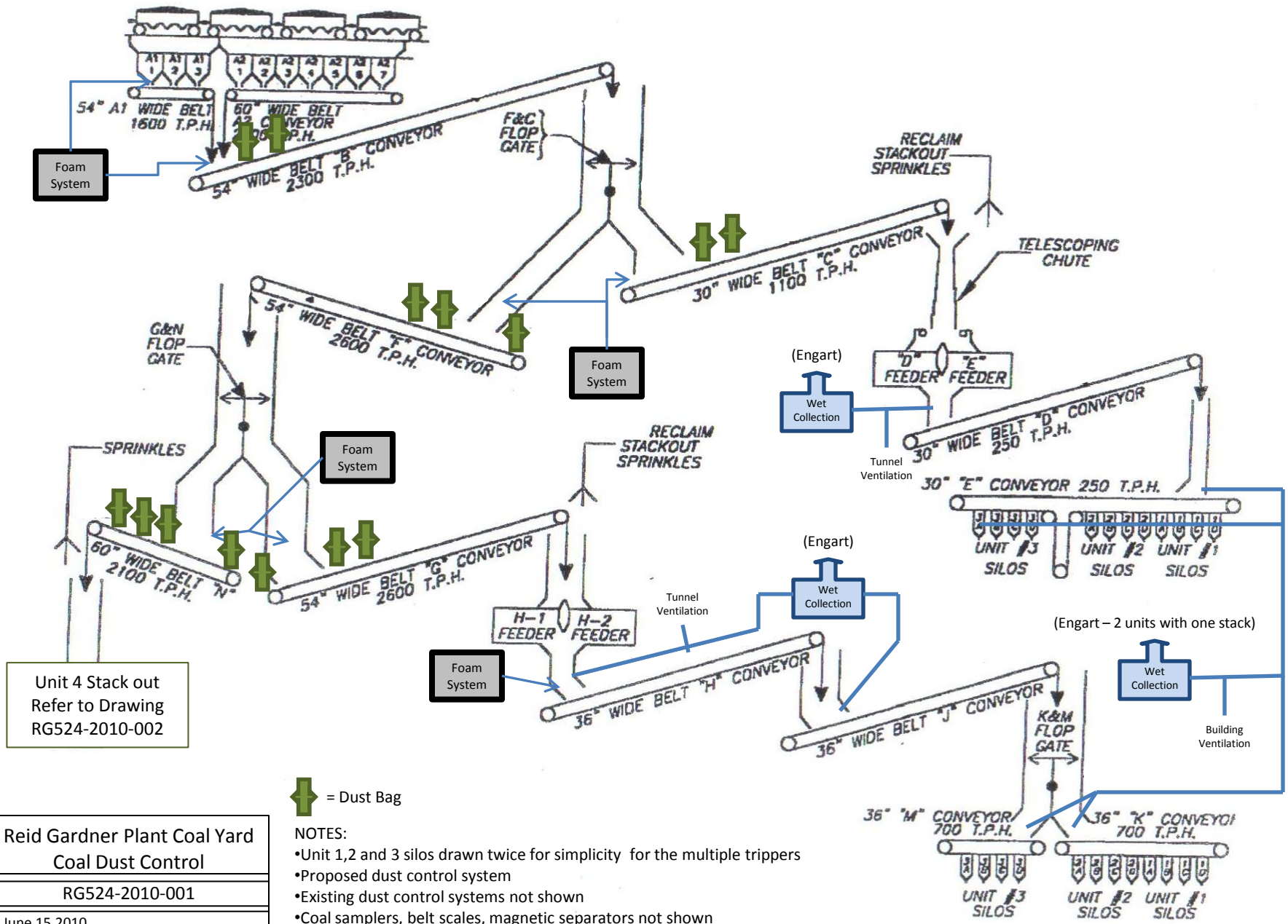


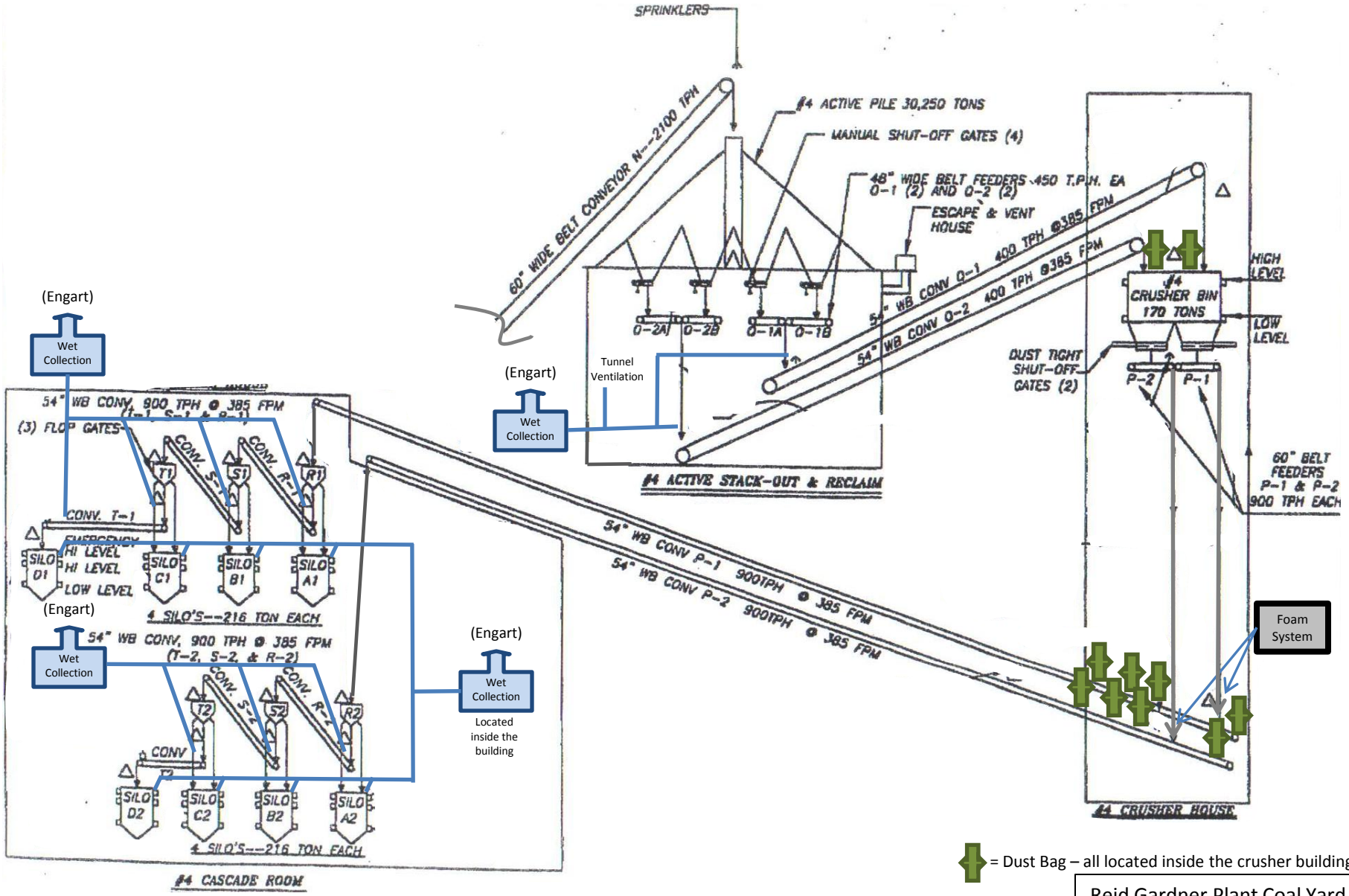
Figure 1.1 Coal Handling System Overview



NOTES:

- Unit 1,2 and 3 silos drawn twice for simplicity for the multiple trippers
- Proposed dust control system
- Existing dust control systems not shown
- Coal samplers, belt scales, magnetic separators not shown

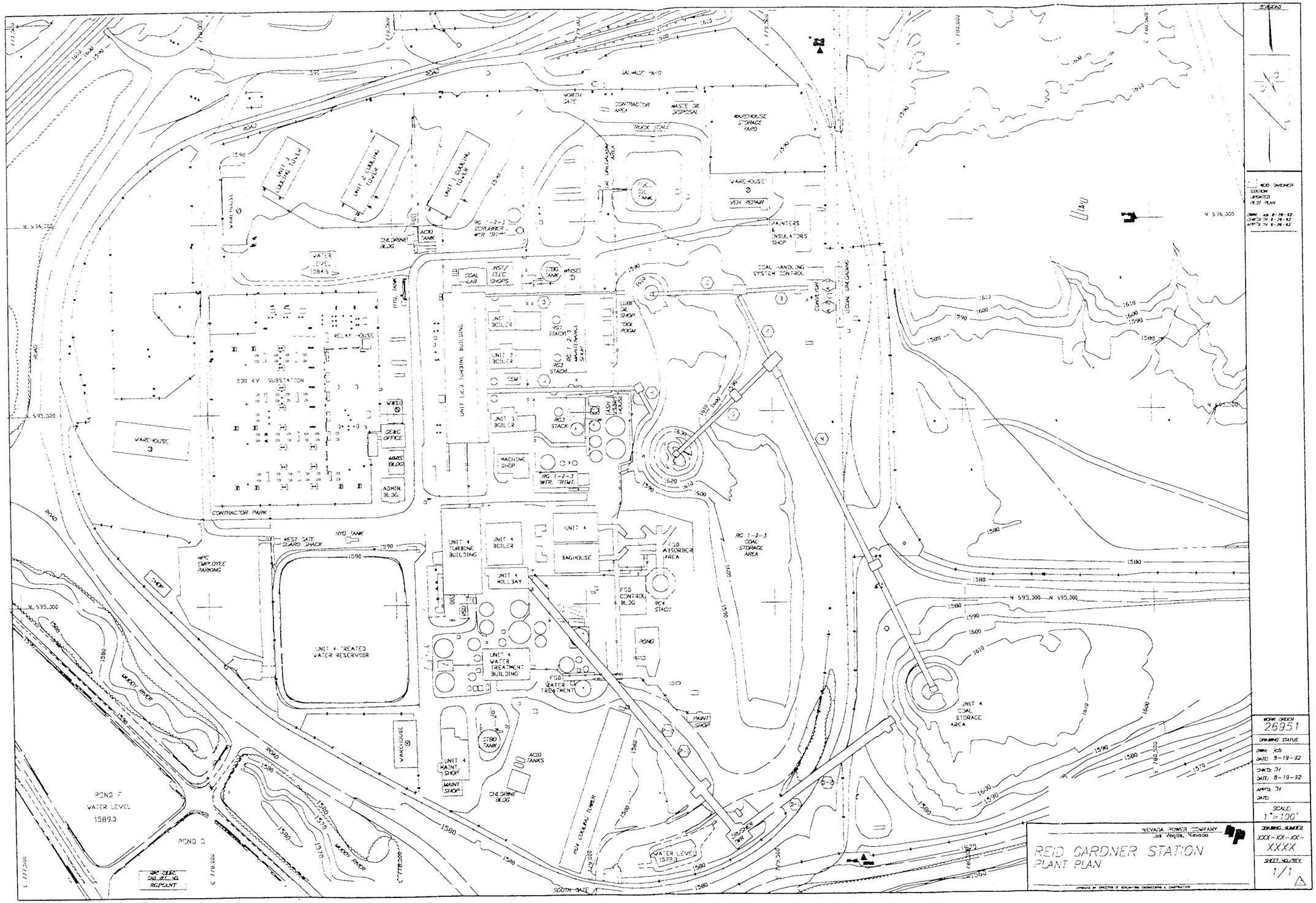
Reid Gardner Plant Coal Yard Coal Dust Control
RG524-2010-001
June 15,2010



NOTES:
- Proposed dust control system
- Existing dust control systems not shown
- Coal samplers, belt scales, magnetic separators not shown

Reid Gardner Plant Coal Yard Unit 4 Coal Dust Control
RG524-2010-002
June 15,2010

PLOT PLAN



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