

SHORT TERM EMISSIONS SUMMARY

| ID | Emission Unit(s) | CO lb/hr | NOx lb/hr | SO2 lb/hr | PM (total) lb/hr | PM10 (total) lb/hr | VOC lb/hr | Pb lb/hr | HF lb/hr | H2SO4 lb/hr |
|--|---|-------------|--------------|--------------|---------------------|-----------------------|--------------|-------------|-------------|----------------|
| Combustion Sources | | | | | | | | | | |
| S01 | Boiler (Coal-Fired) Stack | 1,018 | 475 | 611 | 183 | 170 | 24 | 0.12 | 6.56 | 23 |
| S02 | Reserved | | | | | | | | | |
| S03 | Main Auxiliary Boiler (Natural Gas-Fired) | 14 | 4.00 | 0.24 | 2.00 | 2.00 | 1.60 | -- | -- | 0.074 |
| S04 | Steam Boiler #1 (Natural Gas-Fired) | 12 | 3.50 | 0.21 | 1.75 | 1.75 | 1.40 | -- | -- | 0.064 |
| S05 | Steam Boiler #2 (Natural Gas-Fired) | 12 | 3.50 | 0.21 | 1.75 | 1.75 | 1.40 | -- | -- | 0.064 |
| S06 | Steam Boiler #3 (Natural Gas-Fired) | 12 | 3.50 | 0.21 | 1.75 | 1.75 | 1.40 | -- | -- | 0.064 |
| Coal Handling Particulate Sources | | | | | | | | | | |
| S07 | Railcar Unloading Station | -- | -- | -- | 0.36 | 0.066 | -- | -- | -- | -- |
| S08 | Stackout Conveyor #1 | -- | -- | -- | 3.7E-03 | 3.7E-03 | -- | -- | -- | -- |
| S09 | Stackout Transfer Point #1 | -- | -- | -- | 1.87 | 0.88 | -- | -- | -- | -- |
| S10 | Stackout Conveyor #2 | -- | -- | -- | 1.3E-03 | 1.3E-03 | -- | -- | -- | -- |
| S11 | Stackout Transfer Point #2 | -- | -- | -- | 1.87 | 0.88 | -- | -- | -- | -- |
| S12 | Active Piles #1 and #2 | -- | -- | -- | 0.75 | 0.75 | -- | -- | -- | -- |
| S13 | Active Pile Reclaim | -- | -- | -- | 0.017 | 8.3E-03 | -- | -- | -- | -- |
| S14 | Active Pile Conveyor | -- | -- | -- | 1.7E-03 | 1.7E-03 | -- | -- | -- | -- |
| S15 | Emergency Coal Pile | -- | -- | -- | 0.43 | 0.43 | -- | -- | -- | -- |
| S16 | Emergency Pile Reclaim | -- | -- | -- | 0.017 | 8.3E-03 | -- | -- | -- | -- |
| S17 | Emergency Pile Conveyor | -- | -- | -- | 7.6E-04 | 7.6E-04 | -- | -- | -- | -- |
| S18 | Transfer Tower #1 | -- | -- | -- | 0.28 | 0.28 | -- | -- | -- | -- |
| S19 | Reclaim Conveyor #1 | -- | -- | -- | 1.5E-03 | 1.5E-03 | -- | -- | -- | -- |
| S20 | Transfer Tower #2 / Crusher House | -- | -- | -- | 0.28 | 0.28 | -- | -- | -- | -- |
| S21 | Reclaim Conveyor #2 | -- | -- | -- | 1.8E-03 | 1.8E-03 | -- | -- | -- | -- |
| S22 | Transfer Tower #3 | -- | -- | -- | 0.28 | 0.28 | -- | -- | -- | -- |
| S23 | Reclaim Conveyor #3 | -- | -- | -- | 8.5E-04 | 8.5E-04 | -- | -- | -- | -- |
| S24 | Tripper Deck Conveyor | -- | -- | -- | 1.42 | 1.42 | -- | -- | -- | -- |
| S25 | inactive Pile | -- | -- | -- | 0.40 | 0.28 | -- | -- | -- | -- |
| Biomass Handling Particulate Sources | | | | | | | | | | |
| S26 | Biomass Truck | -- | -- | -- | 0.015 | 0.015 | -- | -- | -- | -- |
| S27 | Biomass Transfer Point | -- | -- | -- | 9.5E-03 | 4.5E-03 | -- | -- | -- | -- |
| S28 | Biomass Storage Dome | -- | -- | -- | 0.30 | 0.30 | -- | -- | -- | -- |
| S29 | Biomass Reclaim Conveyor | -- | -- | -- | 2.0E-04 | 2.0E-04 | -- | -- | -- | -- |
| Ash Management Particulate Sources | | | | | | | | | | |
| S30 | Submerged Chain Conveyor | -- | -- | -- | 5.5E-04 | 5.5E-04 | -- | -- | -- | -- |
| S31 | Bottom Ash Transfer Point #1 | -- | -- | -- | 0.011 | 5.0E-03 | -- | -- | -- | -- |
| S32 | Bottom Ash Bunker | -- | -- | -- | 0.011 | 5.0E-03 | -- | -- | -- | -- |
| S33 | Bottom Ash Transfer Point #2 | -- | -- | -- | 0.032 | 0.015 | -- | -- | -- | -- |
| S34 | Fly Ash Silo | -- | -- | -- | 0.60 | 0.60 | -- | -- | -- | -- |
| S35 | Reserved | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lime Management Particulate Sources | | | | | | | | | | |
| S36 | Lime Silo | -- | -- | -- | 0.60 | 0.60 | -- | -- | -- | -- |
| Carbon Management Particulate Sources | | | | | | | | | | |
| S37 | Carbon Silo | -- | -- | -- | 0.30 | 0.30 | -- | -- | -- | -- |
| Roadway Particulate Sources | | | | | | | | | | |
| S38 | Paved Roadway Travel | -- | -- | -- | 0.13 | 0.026 | -- | -- | -- | -- |
| Cooling Tower Emissions | | | | | | | | | | |
| S39 | Cooling Tower (Mechanical Draft) | -- | -- | -- | 4.21 | 1.29 | -- | -- | -- | -- |
| Emergency Diesel Fired Engines | | | | | | | | | | |
| S40 | Reserved | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| S41 | Reserved | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| S42 | Emergency Diesel Engine Driven Generator | 12 | 21 | 0.026 | 0.66 | 0.66 | 1.49 | -- | -- | 8.1E-03 |
| S43 | Emergency Diesel Engine Driven Firewater Pump | 2.58 | 2.98 | 5.0E-03 | 0.15 | 0.15 | 1.10 | -- | -- | 1.5E-03 |
| Fuel Storage Tanks | | | | | | | | | | |
| S44 | Reserved | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| S45 | Reserved | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| S46 | 2,000 Gallon Diesel Fuel Storage Tank | -- | -- | -- | -- | -- | 3.9E-04 | -- | -- | -- |
| S47 | 500 Gallon Diesel Fuel Storage Tank | -- | -- | -- | -- | -- | 1.9E-05 | -- | -- | -- |
| S48 | 150 Gallon Unleaded Gasoline Storage Tank | -- | -- | -- | -- | -- | 5.9E-03 | -- | -- | -- |

LONG TERM EMISSIONS SUMMARY

| ID | Emission Unit(s) | CO tons/yr | NOx tons/yr | SO2 tons/yr | PM tons/yr | PM10 tons/yr | VOC tons/yr | Pb tons/yr | HF tons/yr | H2SO4 tons/yr |
|--|---|---------------|----------------|----------------|---------------|-----------------|----------------|---------------|---------------|------------------|
| Combustion Sources | | | | | | | | | | |
| S01 | Boiler (Coal-Fired) Stack | 4,458 | 1,486 | 2,675 | 802 | 743 | 104 | 0.34 | 20 | 101 |
| S02 | Reserved | | | | | | | | | |
| S03 | Main Auxiliary Boiler (Natural Gas-Fired) | 61 | 18 | 1.05 | 8.76 | 8.76 | 7.01 | -- | -- | 0.32 |
| S04 | Steam Boiler #1 (Natural Gas-Fired) | 54 | 15 | 0.92 | 7.67 | 7.67 | 6.13 | -- | -- | 0.28 |
| S05 | Steam Boiler #2 (Natural Gas-Fired) | 54 | 15 | 0.92 | 7.67 | 7.67 | 6.13 | -- | -- | 0.28 |
| S06 | Steam Boiler #3 (Natural Gas-Fired) | 54 | 15 | 0.92 | 7.67 | 7.67 | 6.13 | -- | -- | 0.28 |
| Coal Handling Particulate Sources | | | | | | | | | | |
| S07 | Railcar Unloading Station | -- | -- | -- | 0.17 | 0.082 | -- | -- | -- | -- |
| S08 | Stackout Conveyor #1 | -- | -- | -- | 0.016 | 0.016 | -- | -- | -- | -- |
| S09 | Stackout Transfer Point #1 | -- | -- | -- | 0.85 | 0.40 | -- | -- | -- | -- |
| S10 | Stackout Conveyor #2 | -- | -- | -- | 5.7E-03 | 5.7E-03 | -- | -- | -- | -- |
| S11 | Stackout Transfer Point #2 | -- | -- | -- | 0.85 | 0.40 | -- | -- | -- | -- |
| S12 | Active Piles #1 and #2 | -- | -- | -- | 3.28 | 3.28 | -- | -- | -- | -- |
| S13 | Active Pile Reclaim | -- | -- | -- | 0.032 | 0.015 | -- | -- | -- | -- |
| S14 | Active Pile Conveyor | -- | -- | -- | 7.3E-03 | 7.3E-03 | -- | -- | -- | -- |
| S15 | Emergency Coal Pile | -- | -- | -- | 1.87 | 1.87 | -- | -- | -- | -- |
| S16 | Emergency Pile Reclaim | -- | -- | -- | 0.032 | 0.015 | -- | -- | -- | -- |
| S17 | Emergency Pile Conveyor | -- | -- | -- | 3.3E-03 | 3.3E-03 | -- | -- | -- | -- |
| S18 | Transfer Tower #1 | -- | -- | -- | 1.25 | 1.25 | -- | -- | -- | -- |
| S19 | Reclaim Conveyor #1 | -- | -- | -- | 6.8E-03 | 6.8E-03 | -- | -- | -- | -- |
| S20 | Transfer Tower #2 / Crusher House | -- | -- | -- | 1.25 | 1.25 | -- | -- | -- | -- |
| S21 | Reclaim Conveyor #2 | -- | -- | -- | 7.7E-03 | 7.7E-03 | -- | -- | -- | -- |
| S22 | Transfer Tower #3 | -- | -- | -- | 1.25 | 1.25 | -- | -- | -- | -- |
| S23 | Reclaim Conveyor #3 | -- | -- | -- | 3.7E-03 | 3.7E-03 | -- | -- | -- | -- |
| S24 | Tripper Deck Conveyor | -- | -- | -- | 6.23 | 6.23 | -- | -- | -- | -- |
| S25 | Inactive Pile | -- | -- | -- | 1.76 | 1.21 | -- | -- | -- | -- |
| Biomass Handling Particulate Sources | | | | | | | | | | |
| S26 | Biomass Truck | -- | -- | -- | 0.064 | 0.064 | -- | -- | -- | -- |
| S27 | Biomass Transfer Point | -- | -- | -- | 0.014 | 6.5E-03 | -- | -- | -- | -- |
| S28 | Biomass Storage Dome | -- | -- | -- | 1.31 | 1.31 | -- | -- | -- | -- |
| S29 | Biomass Reclaim Conveyor | -- | -- | -- | 8.9E-04 | 8.9E-04 | -- | -- | -- | -- |
| Ash Management Particulate Sources | | | | | | | | | | |
| S30 | Submerged Chain Conveyor | -- | -- | -- | 2.4E-03 | 2.4E-03 | -- | -- | -- | -- |
| S31 | Bottom Ash Transfer Point #1 | -- | -- | -- | 4.0E-03 | 1.9E-03 | -- | -- | -- | -- |
| S32 | Bottom Ash Bunker | -- | -- | -- | 4.0E-03 | 1.9E-03 | -- | -- | -- | -- |
| S33 | Bottom Ash Transfer Point #2 | -- | -- | -- | 4.0E-03 | 1.9E-03 | -- | -- | -- | -- |
| S34 | Fly Ash Silo | -- | -- | -- | 2.62 | 2.62 | -- | -- | -- | -- |
| S35 | Reserved | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| Lime Management Particulate Sources | | | | | | | | | | |
| S36 | Lime Silo | -- | -- | -- | 2.62 | 2.62 | -- | -- | -- | -- |
| Carbon Management Particulate Sources | | | | | | | | | | |
| S37 | Carbon Silo | -- | -- | -- | 1.31 | 1.31 | -- | -- | -- | -- |
| Roadway Particulate Sources | | | | | | | | | | |
| S38 | Paved Roadway Travel | -- | -- | -- | 0.58 | 0.11 | -- | -- | -- | -- |
| Cooling Tower Emissions | | | | | | | | | | |
| S39 | Cooling Tower (Mechanical Draft) | -- | -- | -- | 18 | 5.67 | -- | -- | -- | -- |
| Emergency Diesel Fired Engines | | | | | | | | | | |
| S40 | Reserved | | | | | | | | | |
| S41 | Reserved | | | | | | | | | |
| S42 | Emergency Diesel Engine Driven Generator | 2.89 | 5.29 | 6.6E-03 | 0.17 | 0.17 | 0.37 | -- | -- | 2.0E-03 |
| S43 | Emergency Diesel Engine Driven Firewater Pump | 0.19 | 0.22 | 3.8E-04 | 0.011 | 0.011 | 0.083 | -- | -- | 1.2E-04 |
| Fuel Storage Tanks | | | | | | | | | | |
| S44 | Reserved | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| S45 | Reserved | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| S46 | 2,000 Gallon Diesel Fuel Storage Tank | -- | -- | -- | -- | -- | 8.6E-04 | -- | -- | -- |
| S47 | 500 Gallon Diesel Fuel Storage Tank | -- | -- | -- | -- | -- | 1.3E-04 | -- | -- | -- |
| S48 | 150 Gallon Unleaded Gasoline Storage Tank | -- | -- | -- | -- | -- | 0.033 | -- | -- | -- |
| Total | | 4,683 | 1,555 | 2,678 | 880 | 806 | 130 | 0.34 | 20 | 102 |

| | S01 | | | | Averaging Period | | |
|--------------------------------|----------------|-----------|-----------|-----------|------------------|-----------|-----------|
| | Load Condition | | | | 3-hr | 30 day | Annual |
| | Min. | 50% | 75% | 100% | | | |
| Megawatts (Gross) | 208 | 412 | 618 | 815 | 815 | 815 | 815 |
| Megawatts (Net) | 188 | 375 | 563 | 750 | 750 | 750 | 750 |
| Heat input (MMBtu/hr, HHV) | 1,983 | 3,666 | 5,246 | 6,785 | 6,785 | 6,785 | 6,785 |
| Coal HHV (Btu/lb) | 8,200 | 8,200 | 8,200 | 8,200 | 8,200 | 8,200 | 8,200 |
| Max Sulfur (%) | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% |
| Coal flow (lb/hr) | 241,882 | 447,110 | 639,794 | 827,471 | 827,471 | 827,471 | 827,471 |
| Coal Flow (tons/hr) | 121 | 224 | 320 | 414 | 414 | 414 | 414 |
| Stack Exit Temperature (deg F) | 165 | 165 | 165 | 165 | 165 | 165 | 165 |
| Stack Exit Flow (lb/hr) | 2,376,732 | 4,264,246 | 5,731,156 | 7,412,791 | 7,412,791 | 7,412,791 | 7,412,791 |
| Stack Exit Flow (acfm) | 633,268 | 1,134,586 | 1,520,151 | 1,966,200 | 1,966,200 | 1,966,200 | 1,966,200 |
| Stack Diameter (ft) | 25.3 | 25.3 | 25.3 | 25.3 | 25.3 | 25.3 | 25.3 |
| Stack Velocity (ft/sec) | 20.9 | 37.5 | 50.3 | 65.0 | 65.0 | 65.0 | 65.0 |
| CO | | | | | | | |
| lb/MMBtu | 0.15 | 0.15 | 0.15 | 0.15 | -- | 0.15 | 0.15 |
| lb/hr | 297 | 550 | 787 | 1,018 | -- | 1,018 | 1,018 |
| tpy | -- | -- | -- | -- | -- | -- | 4,458 |
| NOx | | | | | | | |
| lb/MW-hr (net) | 0.74 | 0.68 | 0.65 | 0.63 | -- | 0.63 | 0.45 |
| lb/MMBtu | 0.07 | 0.07 | 0.07 | 0.07 | -- | 0.07 | 0.05 |
| lb/hr | 139 | 257 | 367 | 475 | -- | 475 | 339 |
| tpy | -- | -- | -- | -- | -- | -- | 1,486 |
| SO2 | | | | | | | |
| lb/MW-hr after scrubber (net) | 0.95 | 0.88 | 0.84 | 0.81 | -- | 0.81 | 0.81 |
| lb/MMBtu after scrubber | 0.09 | 0.09 | 0.09 | 0.09 | -- | 0.09 | 0.09 |
| lb/hr after scrubber | 178 | 330 | 472 | 611 | -- | 611 | 611 |
| tpy after scrubber | -- | -- | -- | -- | -- | -- | 2,675 |
| PM - total, controlled | | | | | | | |
| lb/MMBtu | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 | -- | 0.027 |
| lb/hr | 54 | 99 | 142 | 183 | 183 | -- | 183 |
| tpy | -- | -- | -- | -- | -- | -- | 802 |
| PM10 - total, controlled | | | | | | | |
| lb/MMBtu | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | -- | 0.025 |
| lb/hr | 50 | 92 | 131 | 170 | 170 | -- | 170 |
| tpy | -- | -- | -- | -- | -- | -- | 743 |
| PM - filterable, controlled | | | | | | | |
| lb/MMBtu | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 | -- | 0.015 |
| lb/hr | 30 | 55 | 79 | 102 | 102 | -- | 102 |
| tpy | -- | -- | -- | -- | -- | -- | 446 |
| PM10 - filterable, controlled | | | | | | | |
| lb/MMBtu | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | -- | 0.012 |
| lb/hr | 24 | 44 | 63 | 81 | 81 | -- | 81 |
| tpy | -- | -- | -- | -- | -- | -- | 357 |
| VOC | | | | | | | |
| lb/MMBtu | 3.5E-03 | 3.5E-03 | 3.5E-03 | 3.5E-03 | 3.5E-03 | -- | 3.5E-03 |
| lb/hr | 6.94 | 13 | 18 | 24 | 24 | -- | 24 |
| tpy | -- | -- | -- | -- | -- | -- | 104 |
| Lead | | | | | | | |
| ppm, uncontrolled | 9.48 | 9.48 | 9.48 | 9.48 | 15 | -- | 9.48 |
| % Control | 99% | 99% | 99% | 99% | 99% | -- | 99% |
| lb/MMBtu | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.8E-05 | -- | 1.2E-05 |
| lb/hr | 0.023 | 0.042 | 0.061 | 0.078 | 0.12 | -- | 0.078 |
| tpy | -- | -- | -- | -- | -- | -- | 0.34 |
| Fluoride (as HF) | | | | | | | |
| ppm, uncontrolled | 105 | 105 | 105 | 105 | 151 | -- | 105 |
| % Control | 95% | 95% | 95% | 95% | 95% | -- | 95% |
| lb/MMBtu | 6.7E-04 | 6.7E-04 | 6.7E-04 | 6.7E-04 | 9.7E-04 | -- | 6.7E-04 |
| lb/hr | 1.33 | 2.46 | 3.52 | 4.55 | 6.56 | -- | 4.55 |
| tpy | -- | -- | -- | -- | -- | -- | 20 |
| H2SO4 | | | | | | | |
| lb/MMBtu | 3.4E-03 | 3.4E-03 | 3.4E-03 | 3.4E-03 | 3.4E-03 | -- | 3.4E-03 |
| lb/hr | 6.74 | 12 | 18 | 23 | 23 | -- | 23 |
| tpy | -- | -- | -- | -- | -- | -- | 101 |
| Hg | | | | | | | |
| lb/MW-hr | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | -- | -- | 1.5E-05 |
| lb/MMBtu | 1.6E-06 | 1.7E-06 | 1.8E-06 | 1.8E-06 | -- | -- | 1.8E-06 |
| lb/hr | 3.1E-03 | 6.2E-03 | 9.3E-03 | 0.012 | -- | -- | 0.012 |
| tpy | -- | -- | -- | -- | -- | -- | 0.054 |
| NH3 Slip | | | | | | | |
| ppm | 5 | 5 | 5 | 5 | 10 | -- | 5 |
| lb/MMBtu | 2.80E-03 | 2.80E-03 | 2.80E-03 | 2.80E-03 | -- | -- | 2.80E-03 |
| lb/hr | 4.50 | 8 | 11 | 21 | 41 | -- | 21 |
| tpy | -- | -- | -- | -- | -- | -- | 92 |

II. AUXILIARY BOILER

S03 Auxiliary Boiler

| | |
|-----------------------------|---------|
| Heat Input (MMBtu/hr) | 400 |
| Fuel Heating Value (Btu/lb) | 20,000 |
| Fuel Flow (lb/hr) | 20,000 |
| Annual Operating Hours | 8,760 |
| Fuel Sulfur (ppm) | 6 |
| Stack Temperature (deg F) | 670 |
| Stack Height (ft) | 100 |
| Stack Diameter (ft) | 7.24 |
| Stack Flow (acfm) | 146,800 |
| CO | |
| lb/MMBtu | 0.035 |
| lb/hr | 14 |
| ton/year | 61 |
| NOx | |
| lb/MMBtu | 0.010 |
| lb/hr | 4.00 |
| ton/year | 18 |
| SO2 | |
| lb/MMBtu | 6.0E-04 |
| lb/hr | 0.24 |
| ton/year | 1.05 |
| PM/PM10 total | |
| lb/MMBtu | 5.0E-03 |
| lb/hr | 2.00 |
| ton/year | 8.76 |
| PM/PM10 filterable | |
| lb/MMBtu | 5.0E-03 |
| lb/hr | 2.00 |
| ton/year | 8.76 |
| VOC | |
| lb/MMBtu | 4.0E-03 |
| lb/hr | 1.60 |
| ton/year | 7.01 |
| H2SO4 | |
| lb/MMBtu | 1.8E-04 |
| lb/hr | 0.074 |
| ton/year | 0.32 |

Notes: Emission rates are based vendor estimates.
 Natural gas sulfur content is assumed to be a maximum of 6 ppm.
 SO2 emission rate based on fuel sulfur content.
 H2SO4 emission rate based on fuel sulfur content and 20% oxidation rate.

IIIA. STEAM BACK-UP BOILER**S04 Steam Boiler #1 (Natural Gas-Fired)**

| | |
|-----------------------------|---------|
| Heat Input (MMBtu/hr) | 350 |
| Fuel Heating Value (Btu/lb) | 20,000 |
| Fuel Flow (lb/hr) | 17,500 |
| Annual Operating Hours | 8,760 |
| Fuel Sulfur (ppm) | 6 |
| Stack Temperature (deg F) | 300 |
| Stack Height (ft) | 60 |
| Stack Diameter (ft) | 6.5 |
| Stack Flow (acfm) | 100,884 |
| CO | |
| lb/MMBtu | 0.035 |
| lb/hr | 12 |
| ton/year | 54 |
| NOx | |
| lb/MMBtu | 0.010 |
| lb/hr | 3.50 |
| ton/year | 15 |
| SO2 | |
| lb/MMBtu | 6.0E-04 |
| lb/hr | 0.21 |
| ton/year | 0.92 |
| PM/PM10 total | |
| lb/MMBtu | 5.0E-03 |
| lb/hr | 1.75 |
| ton/year | 7.67 |
| PM/PM10 filterable | |
| lb/MMBtu | 5.0E-03 |
| lb/hr | 1.75 |
| ton/year | 7.67 |
| VOC | |
| lb/MMBtu | 4.0E-03 |
| lb/hr | 1.40 |
| ton/year | 6.13 |
| H2SO4 | |
| lb/MMBtu | 1.8E-04 |
| lb/hr | 0.064 |
| ton/year | 0.28 |

Notes: Emission rates are based vendor estimates.
 Natural gas sulfur content is assumed to be a maximum of 6 ppm.
 SO2 emission rate based on fuel sulfur content.
 H2SO4 emission rate based on fuel sulfur content and 20% oxidation rate.

IIIB. STEAM BACK-UP BOILER**S05 Steam Boiler #2 (Natural Gas-Fired)**

| | |
|-----------------------------|--------|
| Heat Input (MMBtu/hr) | 350 |
| Fuel Heating Value (Btu/lb) | 20,000 |
| Fuel Flow (lb/hr) | 17,500 |
| Annual Operating Hours | 8,760 |
| Fuel Sulfur (ppm) | 6 |

| | |
|---------------------------|---------|
| Stack Temperature (deg F) | 300 |
| Stack Height (ft) | 60 |
| Stack Diameter (ft) | 6.5 |
| Stack Flow (acfm) | 100,884 |

| | |
|----------|-------|
| CO | |
| lb/MMBtu | 0.035 |
| lb/hr | 12 |
| ton/year | 54 |

| | |
|----------|-------|
| NOx | |
| lb/MMBtu | 0.010 |
| lb/hr | 3.50 |
| ton/year | 15 |

| | |
|----------|---------|
| SO2 | |
| lb/MMBtu | 6.0E-04 |
| lb/hr | 0.21 |
| ton/year | 0.92 |

| | |
|---------------|---------|
| PM/PM10 total | |
| lb/MMBtu | 5.0E-03 |
| lb/hr | 1.75 |
| ton/year | 7.67 |

| | |
|--------------------|---------|
| PM/PM10 filterable | |
| lb/MMBtu | 5.0E-03 |
| lb/hr | 1.75 |
| ton/year | 7.67 |

| | |
|----------|---------|
| VOC | |
| lb/MMBtu | 4.0E-03 |
| lb/hr | 1.40 |
| ton/year | 6.13 |

| | |
|----------|---------|
| H2SO4 | |
| lb/MMBtu | 1.8E-04 |
| lb/hr | 0.064 |
| ton/year | 0.28 |

Notes: Emission rates are based vendor estimates.
 Natural gas sulfur content is assumed to be a maximum of 6 ppm.
 SO2 emission rate based on fuel sulfur content.
 H2SO4 emission rate based on fuel sulfur content and 20% oxidation rate.

IIIC. STEAM BACK-UP BOILER**S06 Steam Boiler #3 (Natural Gas-Fired)**

| | |
|-----------------------------|---------|
| Heat Input (MMBtu/hr) | 350 |
| Fuel Heating Value (Btu/lb) | 20,000 |
| Fuel Flow (lb/hr) | 17,500 |
| Annual Operating Hours | 8,760 |
| Fuel Sulfur (ppm) | 6 |
| Stack Temperature (deg F) | 300 |
| Stack Height (ft) | 60 |
| Stack Diameter (ft) | 6.5 |
| Stack Flow (acfm) | 100,884 |
| CO | |
| lb/MMBtu | 0.035 |
| lb/hr | 12 |
| ton/year | 54 |
| NOx | |
| lb/MMBtu | 0.010 |
| lb/hr | 3.50 |
| ton/year | 15 |
| SO2 | |
| lb/MMBtu | 6.0E-04 |
| lb/hr | 0.21 |
| ton/year | 0.92 |
| PM/PM10 total | |
| lb/MMBtu | 5.0E-03 |
| lb/hr | 1.75 |
| ton/year | 7.67 |
| PM/PM10 filterable | |
| lb/MMBtu | 5.0E-03 |
| lb/hr | 1.75 |
| ton/year | 7.67 |
| VOC | |
| lb/MMBtu | 4.0E-03 |
| lb/hr | 1.40 |
| ton/year | 6.13 |
| H2SO4 | |
| lb/MMBtu | 1.8E-04 |
| lb/hr | 0.064 |
| ton/year | 0.28 |

Notes: Emission rates are based vendor estimates.
 Natural gas sulfur content is assumed to be a maximum of 6 ppm.
 SO2 emission rate based on fuel sulfur content.
 H2SO4 emission rate based on fuel sulfur content and 20% oxidation rate.

IV. COAL HANDLING PARTICULATE EMISSIONS

S07 Railcar Unloading Station

Railcars will be brought into a partially enclosed railcar unloading structure. The railcars will be connected with a rotary coupling so they can be tipped to dump the coal or they will have doors on the bottom which will open to dump the coal. The coal will be dumped into an underground hopper. From the underground hopper the coal will be transferred to a Short Conveyor and then onto Stackout Conveyor #1. A fabric filter baghouse will be used for dust control. It will use bags with a maximum emission rate of 0.005 gr/dscf. The hopper drop, Short Conveyor and one transfer point are located in an enclosed area under the Railcar Unloading Station.

Coal Throughput Design Data

Maximum coal transfer rate: 4,000 tons/hr
3,637,248 tons/yr Assumes full load operation for 8,760 hours per year

Emissions from Railcar Unloading

The EPA AP-42, Section 13.2.4 drop point emission factor calculation is used to estimate continuous drop operation PM and PM10 emission rates. PM emissions are assumed to be equal to PM30 emissions. Hourly emissions are calculated based on the maximum hourly design rate while annual emissions are calculated based on the maximum expected throughput per year.

$$\text{Emission factor: } \left(\frac{\text{lb emissions}}{\text{ton coal}} \right) = k * 0.0032 * \frac{\left(\frac{U}{5} \right)^{1.3}}{\left(\frac{M}{2} \right)^{1.4}}$$

where: k = particulate multiplier = 0.74 for PM
k = particulate multiplier = 0.35 for PM10
U = mean wind speed (mph) = 9.3 average of 2003-2005 aermat files for MBS airport, MI
M = material moisture content in % = 6.9 average surface moisture content of coal

PM Emission factor: 9.35E-04 lb/ton
PM10 Emission factor: 4.42E-04 lb/ton
Control efficiency: 94% for vacuum filtration system

PM = 0.22 lb/hr
PM = 0.10 tons/yr
PM10 = 0.11 lb/hr
PM10 = 0.048 tons/yr

Emissions from hopper drop to Short Conveyor and from Short Conveyor drop to Stackout Conveyor #1

The EPA AP-42, Section 13.2.4 drop point emission factor calculation is used to estimate continuous drop operation PM and PM10 emission rates. PM emissions are assumed to be equal to PM30 emissions. Hourly emissions are calculated based on the maximum hourly design rate while annual emissions are calculated based on the maximum expected throughput per year. Two transfer points are calculated.

$$\text{Emission factor: } \left(\frac{\text{lb emissions}}{\text{ton coal}} \right) = k * 0.0032 * \frac{\left(\frac{U}{5} \right)^{1.3}}{\left(\frac{M}{2} \right)^{1.4}}$$

where: k = particulate multiplier = 0.74 for PM
k = particulate multiplier = 0.35 for PM10
U = mean wind speed (mph) = 1.5 conservative estimate for wind speed in enclosure
M = material moisture content (%) = 6.9 average surface moisture content of coal

PM Emission factor: 8.74E-05 lb/ton
PM10 Emission factor: 4.14E-05 lb/ton
Control efficiency: 80% for partial enclosure

PM = 0.14 lb/hr includes two transfer points
PM = 0.064 tons/yr includes two transfer points
PM10 = 0.066 lb/hr includes two transfer points
PM10 = 0.030 tons/yr includes two transfer points

Short Conveyor Design Data

Surface area: 0.025 acres

Emissions from the Short Conveyor

Emissions are calculated using the EPA AP-42, Section 11.19.1 emission factor calculation for wind erosion of a storage pile. The estimated surface area of the coal stream along the length of the conveyor is used as the equivalent acreage. PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30

um is a conservative estimate for PM10.

Emission factor: 3.50 lb/acre-day
Control efficiency: 80% for partial enclosure

PM = 7.3E-04 lb/hr
PM = 3.2E-03 tons/yr
PM10 = 7.3E-04 lb/hr
PM10 = 3.2E-03 tons/yr

Combined Emissions at Railcar Unloading Station

PM = 0.36 lb/hr
PM = 0.17 tons/yr
PM10 = 0.17 lb/hr
PM10 = 0.082 tons/yr

S08 Stackout Conveyor #1

Stackout Conveyor #1 will transport coal from the Railcar Unloading Station to the Active Pile. A portion of Stackout Conveyor #1 will be located underground. The overland portion of Stackout Conveyor #1 will be partially enclosed.

Coal Throughput and Conveying Design Data

Maximum coal transfer rate: 4,000 tons/hr
3,637,248 tons/yr Assumes full load operation for 8,760 hours per year
Surface area: 0.127 acres

Emissions

Emissions are calculated using the EPA AP-42, Section 11.19.1 emission factor calculation for wind erosion of a storage pile. The estimated surface area of the coal stream along the length of the conveyor is used as the equivalent acreage. PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

Emission factor: 3.50 lb/acre-day
Control efficiency: 80% for partial enclosure

PM = 3.7E-03 lb/hr
PM = 0.016 tons/yr
PM10 = 3.7E-03 lb/hr
PM10 = 0.016 tons/yr

S09 Stackout Transfer Point #1

Coal will be transferred from Stackout Conveyor #1 to the first Active Pile via drop operation at Stackout Transfer Point #1 using a Stacking Tube.

Coal Throughput Design Data

Maximum coal transfer rate: 4,000 tons/hr
3,637,248 tons/yr Assumes full load operation for 8,760 hours per year

Emissions

The EPA AP-42, Section 13.2.4 drop point emission factor calculation is used to estimate continuous drop operation PM and PM10 emission rates. PM emissions are assumed to be equal to PM30 emissions. Hourly emissions are calculated based on the maximum hourly design rate while annual emissions are calculated based on the maximum expected throughput per year.

$$\text{Emission factor : } \left(\frac{\text{lb emissions}}{\text{ton coal}} \right) = k * 0.0032 * \frac{\left(\frac{U}{5} \right)^{1.3}}{\left(\frac{M}{2} \right)^{1.4}}$$

where: k = particulate multiplier = 0.74 for PM
k = particulate multiplier = 0.35 for PM10
U = mean wind speed (mph) = 9.3 average of 2003-2005 aermet files for MBS airport, MI
M = material moisture content (%) = 6.9 average surface moisture content of coal

PM Emission factor: 9.35E-04 lb/ton
PM10 Emission factor: 4.42E-04 lb/ton
Control efficiency: 50% for stacking tube

PM = 1.87 lb/hr
PM = 0.85 tons/yr
PM10 = 0.88 lb/hr

PM10 = 0.40 tons/yr

S10 Stackout Conveyor #2

Stackout Conveyor #2 will transport coal from Stackout Transfer Point #1 to Active Pile #2. Stackout Conveyor #2 will be partially enclosed.

Coal Throughput and Conveying Design Data

| | | | |
|-----------------------------|-----------|---------|--|
| Maximum coal transfer rate: | 4,000 | tons/hr | |
| | 3,637,248 | tons/yr | Assumes full load operation for 8,760 hours per year |
| Surface area: | 0.045 | acres | |

Emissions

Emissions are calculated using the EPA AP-42, Section 11.19.1 emission factor calculation for wind erosion of a storage pile. The estimated surface area of the coal stream along the length of the conveyor is used as the equivalent acreage. PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

| | | |
|---------------------|------|-----------------------|
| Emission factor: | 3.50 | lb/acre-day |
| Control efficiency: | 80% | for partial enclosure |

| | | |
|--------|---------|---------|
| PM = | 1.3E-03 | lb/hr |
| PM = | 5.7E-03 | tons/yr |
| PM10 = | 1.3E-03 | lb/hr |
| PM10 = | 5.7E-03 | tons/yr |

S11 Stackout Transfer Point #2

Coal will be transferred from Stackout Conveyor #2 to Active Pile #2 via drop operation at the Stackout Transfer Point via a Stacking Tube.

Coal Throughput Design Data

| | | | |
|-----------------------------|-----------|---------|--|
| Maximum coal transfer rate: | 4,000 | tons/hr | |
| | 3,637,248 | tons/yr | Assumes full load operation for 8,760 hours per year |

Emissions

The EPA AP-42, Section 13.2.4 drop point emission factor calculation is used to estimate continuous drop operation PM and PM10 emission rates. PM emissions are assumed to be equal to PM30 emissions. Hourly emissions are calculated based on the maximum hourly design rate while annual emissions are calculated based on the maximum expected throughput per year.

$$\text{Emission factor : } \left(\frac{\text{lb emissions}}{\text{ton coal}} \right) = k * 0.0032 * \frac{\left(\frac{U}{5} \right)^{1.3}}{\left(\frac{M}{2} \right)^{1.4}}$$

| | | | | |
|--------|-----------------------------------|---|------|--|
| where: | k = particulate multiplier | = | 0.74 | for PM |
| | k = particulate multiplier | = | 0.35 | for PM10 |
| | U = mean wind speed (mph) | = | 9.3 | average of 2003-2005 aemet files for MBS airport, MI |
| | M = material moisture content (%) | = | 6.9 | average surface moisture content of coal |

| | | |
|-----------------------|----------|-------------------|
| PM Emission factor: | 9.35E-04 | lb/ton |
| PM10 Emission factor: | 4.42E-04 | lb/ton |
| Control efficiency: | 50% | for stacking tube |

| | | |
|--------|------|---------|
| PM = | 1.87 | lb/hr |
| PM = | 0.85 | tons/yr |
| PM10 = | 0.88 | lb/hr |
| PM10 = | 0.40 | tons/yr |

S12 Active Piles #1 and #2

The Active Piles will have approximately 3 days coal supply and an approximate exposed surface area of 1.4 acres assuming two conical piles with approximate base diameters of 180 feet and heights of 75 feet. Fugitive dust emissions will be controlled by dust suppression water sprays.

Coal Pile Design Data

| | | |
|---------------------|-----|-------|
| Area of coal piles: | 1.4 | acres |
|---------------------|-----|-------|

Emissions

Emissions are calculated using the EPA AP-42, Section 11.9.1 emission factor calculation for an active storage pile (wind erosion and maintenance bulldozing). PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

$$\text{Emission factor : } \left(\frac{\text{lb}}{\text{acre} \cdot \text{hr}} \right) = 0.72u$$

where: u = average wind speed (mph) =

9.3 average of 2003-2005 aemet files for MBS airport, MI

Emission factor: 6.68 lb/acre-hr
 Control efficiency: 80% for water sprays
 Control efficiency: 60% for wind screen

PM = 0.75 lb/hr
 PM = 3.28 tons/yr
 PM10 = 0.75 lb/hr
 PM10 = 3.28 tons/yr

S13 Active Pile Reclaim

Coal will be transferred from the Active Piles to the Active Pile Conveyor via a drop operation under the Active Piles. The drops onto the Active Pile Conveyor will take place in an enclosed area under the Active Piles. A fabric filter baghouse will be used for dust control. It will use bags with a maximum emission rate of 0.005 gr/dscf.

Coal Throughput Design Data

Maximum coal transfer rate: 1,000 tons/hr
 3,637,248 tons/yr Assumes full load operation for 8,760 hours per year

Emissions from Active Pile Drop to Active Pile Conveyor

The EPA AP-42, Section 13.2.4 drop point emission factor calculation is used to estimate continuous drop operation PM and PM10 emission rates. PM emissions are assumed to be equal to PM30 emissions. Hourly emissions are calculated based on the maximum hourly design rate while annual emissions are calculated based on the maximum expected throughput per year.

$$\text{Emission factor : } \left(\frac{\text{lb emissions}}{\text{ton coal}} \right) = k * 0.0032 * \frac{\left(\frac{U}{5} \right)^{1.3}}{\left(\frac{M}{2} \right)^{1.4}}$$

where: k = particulate multiplier = 0.74 for PM
 k = particulate multiplier = 0.35 for PM10
 U = mean wind speed (mph) = 1.5 conservative estimate for wind speed in enclosure
 M = material moisture content (%) = 6.9 average surface moisture content of coal

PM Emission factor: 8.74E-05 lb/ton
 PM10 Emission factor: 4.14E-05 lb/ton
 Control efficiency: 80% for partial enclosure

PM = 0.017 lb/hr
 PM = 0.032 tons/yr
 PM10 = 8.3E-03 lb/hr
 PM10 = 0.015 tons/yr

S14 Active Pile Conveyor

The Active Pile Conveyor will transport coal from Active Piles to Transfer Tower #1. The Active Pile Conveyor will be partially enclosed.

Coal Throughput and Conveying Design Data

Maximum coal transfer rate: 1,000 tons/hr
 3,637,248 tons/yr Assumes full load operation for 8,760 hours per year
 Surface area: 0.057 acres

Emissions from the Active Pile Conveyor

Emissions are calculated using the EPA AP-42, Section 11.19.1 emission factor calculation for wind erosion of a storage pile. The estimated surface area of the coal stream along the length of the conveyor is used as the equivalent acreage. PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

Emission factor: 3.50 lb/acre-day
 Control efficiency: 80% for partial enclosure

PM = 1.7E-03 lb/hr
 PM = 7.3E-03 tons/yr
 PM10 = 1.7E-03 lb/hr
 PM10 = 7.3E-03 tons/yr

S15 Emergency Coal Pile

During maintenance or upset of the Active Pile Reclaim system, the Facility will utilize an Emergency Pile. Fugitive dust emissions will be controlled by dust suppression water sprays. The Emergency Coal Pile will be adjacent to the Inactive Coal Pile.

Coal Pile Design Data

Surface area of coal pile: 0.80 acres

Emissions

Emissions are calculated using the EPA AP-42, Section 11.9.1 emission factor calculation for an active storage pile (wind erosion and maintenance bulldozing). PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

$$\text{Emission factor : } \left(\frac{\text{lb}}{\text{acre} \cdot \text{hr}} \right) = 0.72u$$

where: u = average wind speed (mph) = 9.3 average of 2003-2005 aemet files for MBS airport, MI

Emission factor: 6.68 lb/acre-hr
Control efficiency: 80% for water sprays
Control efficiency: 80% for wind screen

PM = 0.43 lb/hr
PM = 1.87 tons/yr
PM10 = 0.43 lb/hr
PM10 = 1.87 tons/yr

S16 Emergency Pile Reclaim

Coal will be transferred from the Emergency Coal Pile to the Emergency Pile Conveyor via a drop operation under the Emergency Coal Pile. The drop onto the Emergency Pile Conveyor will take place in an enclosed area under the Emergency Pile. A fabric filter baghouse will be used for dust control. It will use bags with a maximum emission rate of 0.005 gr/dscf.

Coal Throughput Design Data

Maximum coal transfer rate: 1,000 tons/hr
3,637,248 tons/yr Assumes full load operation for 8,760 hours per year

Emissions from Emergency Pile Drop to Emergency Pile Conveyor

The EPA AP-42, Section 13.2.4 drop point emission factor calculation is used to estimate continuous drop operation PM and PM10 emission rates. PM emissions are assumed to be equal to PM30 emissions. Hourly emissions are calculated based on the maximum hourly design rate while annual emissions are calculated based on the maximum expected throughput per year.

$$\text{Emission factor : } \left(\frac{\text{lb emissions}}{\text{ton coal}} \right) = k * 0.0032 * \frac{\left(\frac{U}{5} \right)^{1.3}}{\left(\frac{M}{2} \right)^{1.4}}$$

where: k = particulate multiplier = 0.74 for PM
 k = particulate multiplier = 0.35 for PM10
 U = mean wind speed (mph) = 1.5 conservative estimate for wind speed in enclosure
 M = material moisture content (%) = 6.9 average surface moisture content of coal

PM Emission factor: 8.74E-05 lb/ton
PM10 Emission factor: 4.14E-05 lb/ton
Control efficiency: 80% for partial enclosure

PM = 0.017 lb/hr
PM = 0.032 tons/yr
PM10 = 8.3E-03 lb/hr
PM10 = 0.015 tons/yr

S17 Emergency Pile Conveyor

The Emergency Pile Conveyor will transport coal from the Emergency Coal Pile to Transfer Tower #1. A portion of the Emergency Pile Conveyor will be underground. The overland portion of Emergency Pile Conveyor will be partially enclosed.

Coal Conveying Design Data

Maximum coal transfer rate: 1,000 tons/hr
3,637,248 tons/yr Assumes full load operation for 8,760 hours per year
Surface area: 0.026 acres

Emissions

Emissions are calculated using the EPA AP-42, Section 11.19.1 emission factor calculation for wind erosion of a storage pile. The estimated surface area of the coal stream along the length of the conveyor is used as the equivalent acreage. PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

Emission factor: 3.50 lb/acre-day
Control efficiency: 80% for partial enclosure

PM = 7.6E-04 lb/hr
PM = 3.3E-03 tons/yr
PM10 = 7.6E-04 lb/hr
PM10 = 3.3E-03 tons/yr

S18 Transfer Tower #1

Transfer Tower #1 will receive coal from the Active Pile Conveyor and Emergency Pile Conveyor for transfer onto the Reclaim Conveyor #1. The Transfer Tower will be enclosed and all emissions will exhaust through a fabric filter.

Filter Design Data

Stack Diameter 1.5 feet
Stack Flow 6,640 dscfm

Emissions from Transfers

The fabric filter will use bags with a maximum emission rate of 0.005 gr/dscf. The estimated stack flow rate and 0.005 gr/dscf emission rate are used to estimate PM and PM10 emission rates. Hourly emissions are calculated based on the maximum hourly design rate. Annual emissions are calculated based on 8,760 hours of operation per year at the maximum hourly design rate.

Emission factor : 0.005 grains/dscf

PM = 0.28 lb/hr
PM = 1.25 tons/yr
PM10 = 0.28 lb/hr
PM10 = 1.25 tons/yr

S19 Reclaim Conveyor #1

Reclaim Conveyor #1 will transport coal from Transfer Tower #1 to Transfer Tower #2 / Crusher House. Reclaim Conveyor #1 will be partially enclosed.

Coal Throughput and Conveying Design Data

Maximum coal transfer rate: 2,000 tons/hr
3,637,248 tons/yr
Surface area: 0.053 acres
Assumes full load operation for 8,760 hours per year

Emissions

Emissions are calculated using the EPA AP-42, Section 11.19.1 emission factor calculation for wind erosion of a storage pile. The estimated surface area of the coal stream along the length of the conveyor is used as the equivalent acreage. PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

Emission factor: 3.50 lb/acre-day
Control efficiency: 80% for partial enclosure

PM = 1.5E-03 lb/hr
PM = 6.8E-03 tons/yr
PM10 = 1.5E-03 lb/hr
PM10 = 6.8E-03 tons/yr

S20 Transfer Tower #2 / Crusher House

Transfer Tower #2 / Crusher House will receive coal from the Reclaim Conveyor #1 for transfer onto Reclaim Conveyor #2 and will receive biomass from the Biomass Reclaim Conveyor. Transfer Tower #2 may also contain a crusher for crushing any large pieces of coal. Transfer Tower #2 / Crusher House will be enclosed and all emissions will exhaust through a fabric filter.

Filter Design Data

Stack Diameter 1.5 feet
Stack Flow 6,640 dscfm

Emissions from Transfers and Crusher

The fabric filter will use bags with a maximum emission rate of 0.005 gr/dscf. The estimated stack flow rate and 0.005 gr/dscf emission rate are used to estimate

PM and PM10 emission rates. Hourly emissions are calculated based on the maximum hourly design rate. Annual emissions are calculated based on 8,760 hours of operation per year at the maximum hourly design rate.

Emission factor : 0.005 grains/dscf

PM = 0.28 lb/hr
 PM = 1.25 tons/yr
 PM10 = 0.28 lb/hr
 PM10 = 1.25 tons/yr

S21 Reclaim Conveyor #2

Reclaim Conveyor #2 will transport coal/biomass from Transfer Tower #2 / Crusher House to Transfer Tower #3. Reclaim Conveyor #2 will be partially enclosed.

Fuel Throughput and Conveying Design Data

| | | | |
|-----------------------------|-----------|---------|--|
| Maximum coal transfer rate: | 2,000 | tons/hr | Assumes full load operation for 8,760 hours per year |
| | 3,637,248 | tons/yr | |
| Surface area: | 0.060 | acres | |

Emissions

Emissions are calculated using the EPA AP-42, Section 11.19.1 emission factor calculation for wind erosion of a storage pile. The estimated surface area of the fuel stream along the length of the conveyor is used as the equivalent acreage. PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

Emission factor: 3.50 lb/acre-day
 Control efficiency: 80% for partial enclosure

PM = 1.8E-03 lb/hr
 PM = 7.7E-03 tons/yr
 PM10 = 1.8E-03 lb/hr
 PM10 = 7.7E-03 tons/yr

S22 Transfer Tower #3

Transfer Tower #3 will receive coal/biomass from Reclaim Conveyor #2 for transfer onto Reclaim Conveyor #3. Transfer Tower #3 will be enclosed and all emissions will exhaust through a fabric filter.

Filter Design Data

| | | |
|----------------|-------|-------|
| Stack Diameter | 1.5 | feet |
| Stack Flow | 6,640 | dscfm |

Emissions from Transfers and Crusher

The fabric filter will use bags with a maximum emission rate of 0.005 gr/dscf. The estimated stack flow rate and 0.005 gr/dscf emission rate are used to estimate PM and PM10 emission rates. Hourly emissions are calculated based on the maximum hourly design rate. Annual emissions are calculated based on 8,760 hours of operation per year at the maximum hourly design rate.

Emission factor : 0.005 grains/dscf

PM = 0.28 lb/hr
 PM = 1.25 tons/yr
 PM10 = 0.28 lb/hr
 PM10 = 1.25 tons/yr

S23 Reclaim Conveyor #3

Reclaim Conveyor #3 will transport coal/biomass from Transfer Tower #3 to the Tripper Deck Conveyor. The Reclaim Conveyor will be partially enclosed.

Fuel Throughput and Conveying Design Data

| | | | |
|-----------------------------|-----------|---------|--|
| Maximum coal transfer rate: | 2,000 | tons/hr | Assumes full load operation for 8,760 hours per year |
| | 3,637,248 | tons/yr | |
| Surface area: | 0.029 | acres | |

Emissions

Emissions are calculated using the EPA AP-42, Section 11.19.1 emission factor calculation for wind erosion of a storage pile. The estimated surface area of the fuel stream along the length of the conveyor is used as the equivalent acreage. PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

Emission factor: 3.50 lb/acre-day

Control efficiency: 80% for partial enclosure

PM = 8.5E-04 lb/hr
 PM = 3.7E-03 tons/yr
 PM10 = 8.5E-04 lb/hr
 PM10 = 3.7E-03 tons/yr

S24 Tripper Deck Conveyor

The Tripper Deck Conveyor will receive coal/biomass from Reclaim Conveyor # 3 and transport it to the Coal/Biomass Silos. The Tripper Deck Conveyor, silos and two transfer points will be enclosed and the enclosure will exhaust through a fabric filter.

Filter Design Data

Stack Diameter 3.0 feet
 Stack Flow 33,200 dscfm

Emissions from the Reclaim Conveyor drop to the Tripper Deck Conveyor and the Tripper Deck Conveyor drops to the silos

The fabric filter will use bags with a maximum emission rate of 0.005 gr/dscf. The estimated stack flow rate and 0.005 gr/dscf emission rate are used to estimate PM and PM10 emission rates. Hourly emissions are calculated based on the maximum hourly design rate. Annual emissions are calculated based on 8,760 hours of operation per year at the maximum hourly design rate.

Emission factor : 0.005 grains/dscf

PM = 1.42 lb/hr
 PM = 6.23 tons/yr
 PM10 = 1.42 lb/hr
 PM10 = 6.23 tons/yr

S25 Inactive Pile

The Inactive Pile configuration has been shaped to fit within the site constraints. The Inactive Pile will be approximately 13 acres with a height of 30 feet and side slopes of 2:1. To account for potential weekly disturbances, approximately 7% of the pile surface area is assumed to be affected by pile maintenance and is calculated as an active stockpile. The remaining 93%, the Inactive Portion, is assumed to be affected by wind erosion and is calculated as industrial wind erosion. Fugitive dust emissions will be controlled by dust suppression spray water plus chemical suppressant as necessary.

Emissions from Inactive Portion

Emissions are calculated using the EPA AP-42, Section 13.2.5 emission factor calculation for industrial wind erosion. PM emissions are assumed to be equal to PM30 emissions. Emissions from the pile are conservatively modeled using the fastest mile of wind recorded in the five years of Michigan meteorology data used for PSD modeling.

Emission factor : $k \sum_{i=1}^N p_i$ where $P_i = 58 (u^* - u^* t)^2 + 25 (u^* - u^* t)$ for $u^* > u^* t$
 and $P_i = 0$ for $u^* \leq u^* t$

where

| | | | |
|--|---|--------------|--|
| k = Particle size multiplier | = | 1.0 | PM |
| k = Particle size multiplier | = | 0.5 | PM10 |
| Pi = Erosion Potential Function (g/m ²) | = | | |
| u* = Equivalent friction velocity | = | 0.1 us+ | |
| us+ = Surface wind speed distribution | = | us/ur x u10+ | |
| us/ur = Ratio of surface wind speed to approach wind speed | = | 18.5 | max of 2003-2005 aemet files for MBS airport, MI |
| u10+ = Fastest mile of ref. anemometer (m/s) | = | 1.12 | Uncrusted Coal Pile From AP-42 Table 13.2.5-2 |
| u*t = Threshold friction velocity (m/s) | = | | |

Based on the shape and the orientation to the prevailing wind direction guidance given in AP-42 Section 13.2.5, the inactive coal pile can be subdivided into four us/ur ratio subareas. These four subareas are used to calculate the equivalent friction velocity (u*).

| | Subarea #1 | Subarea #2 | Subarea #3 | Subarea #4 |
|-------------------------------|------------|------------|------------|------------|
| Surface Area, ft ² | 163,848 | 315,992 | 81,924 | 23,407 |
| Subarea us/ur | 0.2 | 0.6 | 0.9 | 1.1 |
| Subarea us+ | 3.70 | 11.10 | 16.65 | 20.35 |
| Subarea u* | 0.37 | 1.11 | 1.67 | 2.04 |
| Subarea u*t | 1.12 | 1.12 | 1.12 | 1.12 |
| Is u* < u*t? | Yes | Yes | No | No |
| Subarea Pi | 0.00 | 0.00 | 30.85 | 71.43 |

PM Emission factor (g/m²/yr): 102.29
 PM Emission factor (lb/ft²/hr): 2.39E-06
 PM10 Emission factor (g/m²/yr): 51.14
 PM10 Emission factor (lb/ft²/hr): 1.20E-06

PM = 0.25 lb/hr
 PM = 1.10 tons/yr
 PM10 = 0.13 lb/hr
 PM10 = 0.55 tons/yr

Active Portion Pile Design Data

Surface area: 0.9 acres

Emissions from Active Portion

Emissions are calculated using the EPA AP-42, Section 11.9.1 emission factor calculation for an active storage pile (wind erosion and maintenance bulldozing). PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

Emission factor : $\left(\frac{\text{lb}}{\text{acre} \cdot \text{hr}} \right) = 0.72u$

where: u = average wind speed (mph) = 9.3 average of 2003-2005 aermat files for MBS airport, MI

Emission factor: 6.68 lb/acre-hr
 Control efficiency = 97.5% for water sprays and chemical suppressant

PM = 0.15 lb/hr
 PM = 0.66 tons/yr
 PM10 = 0.15 lb/hr
 PM10 = 0.66 tons/yr

Combined Emissions at Inactive Pile

PM = 0.40 lb/hr
 PM = 1.76 tons/yr
 PM10 = 0.28 lb/hr
 PM10 = 1.21 tons/yr

V. BIOMASS HANDLING PARTICULATE EMISSIONS

S26 Biomass Truck

Biomass will be transported by truck to the site. The biomass will be moisture conditioned thereby minimizing fugitive emissions or the trucks will be covered.

Biomass Throughput Design Data

| | | | |
|--------------------------------|---------|---------|---|
| Maximum biomass transfer rate: | 150 | tons/hr | |
| | 438,000 | tons/yr | Assumes 10% of full load operation for 8,760 hours per year |
| Surface area: | 1.00 | acres | |

Emissions

Emissions are calculated using the EPA AP-42, Section 11.19.1 emission factor calculation for wind erosion of a storage pile. The estimated surface area of the biomass stream along the length of the conveyor is used as the equivalent acreage. PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

| | | |
|---------------------|------|-------------------------------|
| Emission factor: | 3.50 | lb/acre-day |
| Control efficiency: | 90% | surface moisture conditioning |

| | | |
|--------|-------|---------|
| PM = | 0.015 | lb/hr |
| PM = | 0.064 | tons/yr |
| PM10 = | 0.015 | lb/hr |
| PM10 = | 0.064 | tons/yr |

S27 Biomass Transfer Point

Biomass will be transferred from the Biomass truck to the Biomass Storage Dome via drop operation at the Biomass Transfer Point.

Biomass Throughput Design Data

| | | | |
|--------------------------------|---------|---------|---|
| Maximum biomass transfer rate: | 150 | tons/hr | |
| | 438,000 | tons/yr | Assumes 10% of full load operation for 8,760 hours per year |

Emissions

The EPA AP-42, Section 13.2.4 drop point emission factor calculation is used to estimate continuous drop operation PM and PM10 emission rates. PM emissions are assumed to be equal to PM30 emissions. Hourly emissions are calculated based on the maximum hourly design.

$$\text{Emission factor : } \left(\frac{\text{lb emissions}}{\text{ton biomass}} \right) = k * 0.0032 * \frac{\left(\frac{U}{5} \right)^{1.3}}{\left(\frac{M}{2} \right)^{1.4}}$$

| | | | | |
|--------|-----------------------------------|---|------|---|
| where: | k = particulate multiplier | = | 0.74 | for PM |
| | k = particulate multiplier | = | 0.35 | for PM10 |
| | U = mean wind speed (mph) | = | 9.3 | average of 2003-2005 aermet files for MBS airport, MI |
| | M = material moisture content (%) | = | 15 | Bioenergy Feedstock Characteristics (ORNL) |

| | | |
|-----------------------|----------|---|
| PM Emission factor: | 3.15E-04 | lb/ton |
| PM10 Emission factor: | 1.49E-04 | lb/ton |
| Control efficiency: | 80% | for partial enclosure and fabric filtration |

| | | |
|--------|---------|---------|
| PM = | 9.5E-03 | lb/hr |
| PM = | 0.014 | tons/yr |
| PM10 = | 4.5E-03 | lb/hr |
| PM10 = | 6.5E-03 | tons/yr |

S28 Biomass Storage Dome

Biomass will be transferred from Biomass Trucks to the Biomass Storage Dome. The Biomass Storage Dome will exhaust through a fabric filter.

Filter Design Data

| | | |
|----------------|-------|-------|
| Stack Diameter | 1.5 | feet |
| Stack Flow | 6,972 | dscfm |

Emissions from Transfers

The fabric filter will use bags with a maximum emission rate of 0.005 gr/dscf. The estimated stack flow rate and 0.005 gr/dscf emission rate are used to estimate PM and PM10 emission rates. Hourly emissions are calculated based on the maximum hourly design.

Emission factor : 0.005 grains/dscf

| | | |
|--------|------|---------|
| PM = | 0.30 | lb/hr |
| PM = | 1.31 | tons/yr |
| PM10 = | 0.30 | lb/hr |
| PM10 = | 1.31 | tons/yr |

S29 Biomass Reclaim Conveyor

Biomass Reclaim Conveyor will transport biomass from the Biomass Storage Dome to Transfer Tower #2 / Crusher House. The Biomass Reclaim Conveyor will be partially enclosed.

Biomass Throughput and Conveying Design Data

| | | | |
|--------------------------------|---------|---------|---|
| Maximum biomass transfer rate: | 50 | tons/hr | Assumes 10% of full load operation for 8,760 hours per year |
| | 438,000 | tons/yr | |
| Surface area: | 7.0E-03 | acres | |

Emissions

Emissions are calculated using the EPA AP-42, Section 11.19.1 emission factor calculation for wind erosion of a storage pile. The estimated surface area of the biomass stream along the length of the conveyor is used as the equivalent acreage. PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

| | | |
|---------------------|------|-----------------------|
| Emission factor: | 3.50 | lb/acre-day |
| Control efficiency: | 80% | for partial enclosure |

| | | |
|--------|---------|---------|
| PM = | 2.0E-04 | lb/hr |
| PM = | 8.9E-04 | tons/yr |
| PM10 = | 2.0E-04 | lb/hr |
| PM10 = | 8.9E-04 | tons/yr |

VI. ASH MANAGEMENT PARTICULATE SOURCES

Wastes produced by the boiler, scrubber, and fabric filter are grouped into two types, bottom ash and fly ash.

BOTTOM ASH

The term "bottom ash" is used to refer collectively to the boiler bottom ash, pyrite rejects, and economizer/air heater ash. This waste stream is modeled as a separate waste stream.

S30 Submerged Chain Conveyor

The Submerged Chain Conveyor will transport ash from the bottom of the boilers to the Bottom Ash Bunker. The Submerged Chain Conveyor mainly consists of a water-filled trough located under the boiler into which the ash falls. The ash is removed from the trough by a drag conveyor made up of two strands of metal chain and metal bars connecting the two strands. The ash discharged from the Submerged Chain Conveyor may be discharged directly to the Bottom Ash Bunker or the ash may be passed through a grinder in order to reduce the size of the ash particles.

Bottom Ash Throughput and Conveying Design Data

| | | | |
|-----------------------------------|--------|---------|--|
| Maximum bottom ash transfer rate: | 50 | tons/hr | Assumes full load operation for 8,760 hours per year |
| | 38,200 | tons/yr | |
| Surface area: | 0.019 | acres | |

Emissions from Submerged Chain Conveyor

Emissions are calculated using the EPA AP-42, Section 11.19.1 emission factor calculation for wind erosion of a storage pile. The estimated surface area of the ash stream along the length of the conveyor is used as the equivalent acreage. PM and PM10 emissions are computed as TSP <= 30 um. Use of TSP <= 30 um is a conservative estimate for PM10.

| | | |
|---------------------|------|-----------------------|
| Emission factor: | 3.50 | lb/acre-day |
| Control efficiency: | 80% | for partial enclosure |

| | | |
|--------|---------|---------|
| PM = | 5.5E-04 | lb/hr |
| PM = | 2.4E-03 | tons/yr |
| PM10 = | 5.5E-04 | lb/hr |
| PM10 = | 2.4E-03 | tons/yr |

S31 Bottom Ash Transfer Point #1

The Facility may have a grinder for reducing the size of any large pieces of bottom ash, otherwise the bottom ash will be dropped from the Submerged Chain Conveyor onto the bottom ash pile at the Bottom Ash Bunker. If a grinder is used, a building will be used to enclose the grinder and two transfer points. Since AP-42 Section 11.24 lists emissions from wet grinding as negligible, the grinding operation and two enclosed transfer points are not calculated. Instead, emissions are conservatively calculated for the single exposed transfer point. The bottom ash will have a high surface moisture content thereby reducing emissions.

Bottom Ash Throughput Design Data

| | | | |
|-----------------------------------|--------|---------|--|
| Maximum bottom ash transfer rate: | 50 | tons/hr | Assumes full load operation for 8,760 hours per year |
| | 38,200 | tons/yr | |

Emissions

The EPA AP-42, Section 13.2.4 drop point emission factor calculation is used to estimate continuous drop operation PM and PM10 emission rates. PM emissions are assumed to be equal to PM30 emissions. Hourly emissions are calculated based on the maximum hourly design rate while annual emissions are calculated based on the maximum expected throughput per year.

$$\text{Emission factor: } \left(\frac{\text{lb emissions}}{\text{ton ash}} \right) = k * 0.0032 * \frac{\left(\frac{U}{5} \right)^{1.3}}{\left(\frac{M}{2} \right)^{1.4}}$$

| | | | | |
|--------|-----------------------------------|---|------|---|
| where: | k = particulate multiplier | = | 0.74 | for PM |
| | k = particulate multiplier | = | 0.35 | for PM10 |
| | U = mean wind speed (mph) | = | 9.3 | average of 2003-2005 aermet files for MBS airport, MI |
| | M = material moisture content (%) | = | 20 | average moisture content of bottom ash |

| | | |
|-----------------------|----------|--------|
| PM Emission factor: | 2.11E-04 | lb/ton |
| PM10 Emission factor: | 9.96E-05 | lb/ton |

| | | |
|--------|---------|---------|
| PM = | 0.011 | lb/hr |
| PM = | 4.0E-03 | tons/yr |
| PM10 = | 5.0E-03 | lb/hr |
| PM10 = | 1.9E-03 | tons/yr |

FLY ASH MANAGEMENT PARTICULATE SOURCES

The term "fly ash" is used to refer collectively to the fly ash and scrubber waste from the fabric filter. The fly ash will be transported off-site as dry ash via covered trucks.

S34 Fly Ash Silo

The fly ash will first be transported through pipes by pneumatic means from the boiler fabric filter to one or more Fly Ash Silos. The transfer of portions of the fly ash to multiple silos is modeled as one transfer of all fly ash to one silo. From the Fly Ash Silo(s), the fly ash will be pneumatically transferred to the loading facility. Fly ash will be pneumatically transferred from the Fly Ash Silo(s) to a covered truck. Each silo vent and any emissions associated with loading ash in the covered truck will exhaust through a vent filter.

Filter Design Data

| | | |
|----------------|-------|-------|
| Stack Diameter | 1.5 | feet |
| Stack Flow | 6,972 | dscfm |

Emissions

The vent filter will use bags with a maximum emission rate of 0.01 gr/dscf. The estimated stack flow rate and 0.01 gr/dscf emission rate are used to estimate PM and PM10 emission rates. Hourly emissions are calculated based on the maximum hourly design rate. Annual emissions are calculated based on 8,760 hours of operation per year at the maximum hourly design rate.

| | | |
|------------------|------|---------|
| Emission factor: | 0.01 | gr/dscf |
|------------------|------|---------|

| | | |
|--------|------|---------|
| PM = | 0.60 | lb/hr |
| PM = | 2.62 | tons/yr |
| PM10 = | 0.60 | lb/hr |
| PM10 = | 2.62 | tons/yr |

VII. LIME HANDLING PARTICULATE SOURCES

S36 Lime Silo

Lime will be transferred from pneumatic trucks to the Lime Silo. From the Lime Silo, the lime will be gravity fed to a mixing station. At the enclosed mixing station a slurry will be created. The Lime Silo will exhaust through a vent filter.

Filter Design Data

| | | |
|----------------|-------|-------|
| Stack Diameter | 1.5 | feet |
| Stack Flow | 6,972 | dscfm |

Emissions

The vent filter will use bags with a maximum emission rate of 0.01 gr/dscf. The estimated stack flow rate and 0.01 gr/dscf emission rate are used to estimate PM and PM10 emission rates. Hourly emissions are calculated based on the maximum hourly design rate. Annual emissions are calculated based on 8,760 hours of operation per year at the maximum hourly design rate.

| | | |
|-------------------|------|---------|
| Emission factor : | 0.01 | gr/dscf |
|-------------------|------|---------|

| | | |
|--------|------|---------|
| PM = | 0.60 | lb/hr |
| PM = | 2.62 | tons/yr |
| PM10 = | 0.60 | lb/hr |
| PM10 = | 2.62 | tons/yr |

VIII. CARBON HANDLING PARTICULATE SOURCES

S37 Carbon Silo

Halogenated Activated Carbon will be transferred from pneumatic trucks to the Carbon Silo. From the Carbon Silo, the carbon will be pneumatically injected into the flue gas stream. The Carbon Silo will exhaust through a vent filter.

Filter Design Data

| | | |
|----------------|-------|-------|
| Stack Diameter | 1.0 | feet |
| Stack Flow | 3,486 | dscfm |

Emissions

The vent filter will use bags with a maximum emission rate of 0.01 gr/dscf. The estimated stack flow rate and 0.01 gr/dscf emission rate are used to estimate PM and PM10 emission rates. Hourly emissions are calculated based on the maximum hourly design rate. Annual emissions are calculated based on 8,760 hours of operation per year at the maximum hourly design rate.

Emission factor : 0.01 gr/dscf

| | | |
|--------|------|---------|
| PM = | 0.30 | lb/hr |
| PM = | 1.31 | tons/yr |
| PM10 = | 0.30 | lb/hr |
| PM10 = | 1.31 | tons/yr |

IX. ROADWAY PARTICULATE SOURCES

S38 Paved Roadway Travel

All roads at the Facility will be paved. Daily road travel is estimated according to the maximum expected trips per day. Fugitive emissions will be controlled by water sprays and/or sweeping.

Emissions

Emissions are calculated using the EPA AP-42, Section 13.2.1 emission factor calculation for paved roads. PM emissions are assumed to be equal to PM30 emissions. Emissions are conservatively estimated using maximum expected number of vehicle trips per day, 365 days per year.

Emission factor :

$$\left(\frac{1b}{VMT} \right) = \left(k \left(\frac{sL}{2} \right)^{.65} \left(\frac{W}{3} \right)^{1.5} - C \right) \left(1 - \frac{P}{4N} \right)$$

- where:
- k = particle size multiplier = 0.082 per AP-42 Table 13.2-1.1 for PM30
 - k = particle size multiplier = 0.016 per AP-42 Table 13.2-1.1 for PM10
 - sL = road surface silt loading (g/m²) = 1.10 per AP-42 Section 13.2.1 for annual avg conditions
 - W = avg vehicle weight (tons) = 13.2 calculated below
 - C = emission factor for 1980's data = 0.00047 per AP-42 Table 13.2.1-2 for PM30
 - C = emission factor for 1980's data = 0.00047 per AP-42 Table 13.2.1-2 for PM10
 - P = # of days with 0.01" precipitation = 140 per AP-42 Figure 13.2.1-2
 - N = # of days in calculation period = 365
 - VMT = vehicle miles traveled

Summary of daily vehicle travel on paved roads:

| vehicle type | VMT per trip | weight (tons) | trips per day | total VMT daily | weight x daily VMT |
|-------------------------------|--------------|---------------|-----------------------------|-----------------|--------------------|
| bottom ash trucks | 0.8 | 40 | 7 | 6 | 224 |
| fly ash trucks | 0.7 | 40 | 42 | 29 | 1,176 |
| lime trucks | 0.5 | 30 | 9 | 5 | 135 |
| carbon trucks | 0.5 | 40 | 1 | 1 | 20 |
| ammonia trucks | 0.5 | 40 | 1 | 1 | 20 |
| employee/visitor cars | 0.6 | 2 | 120 | 72 | 144 |
| maintenance vehicles | 2.0 | 3 | 10 | 20 | 60 |
| miscellaneous delivery trucks | 0.6 | 5 | 5 | 3 | 15 |
| Totals | | | | 136 | 1,794 |
| | | | avg vehicle weight (tons) = | | 13.2 |

PM Emission factor: 0.47 lb/VMT
 PM10 Emission factor: 0.09 lb/VMT
 Control efficiency = 95% for speed reduction and water sprays and/or sweeping

PM = 0.13 lb/hr
 PM = 0.58 tons/yr
 PM10 = 0.028 lb/hr
 PM10 = 0.11 tons/yr

X. COOLING TOWER EMISSIONS

S39 Cooling Tower (Mechanical Draft)

Cooling Tower Design Data

| | | |
|------------------------------------|-------|-----------------------------|
| Number of Cells per Tower | | 24 |
| Circulation Water Flow (per tower) | gpm | 420,000 |
| TDS in Cooling Tower | mg/L | 4,000 |
| Drift Emissions Factor | % | 0.0005 |
| PM Emissions (per tower) | lb/hr | 4.21 |
| PM Emissions (per cell) | lb/hr | 0.18 |
| PM10 Emissions (per tower) | lb/hr | 1.29 |
| PM10 Emissions (per cell) | lb/hr | 0.05 |
| Operating Hours | | 8,760 |
| Annual Emissions | tons | 5.67 |
| Exit Temperature | deg F | 90 (summer) and 50 (winter) |
| Exit Diameter | ft | 30 |
| Exit Height | ft | 50 |
| Tower Width x Overall Length | ft | 120 x 700 |
| Exit Flow Rate (per cell) | acfm | 1,150,000 |

Notes: Drift emissions factor is percent of total circulation water flow
 TDS - Total Dissolved Solids
 PM - Total Particulate Matter PM10 = Particulates < 10 microns

Sample Calculation (maximum condition):

DRIFT:

$$\frac{4.20E+05 \text{ gal water}}{1 \text{ min}} \times \frac{8.345 \text{ lb}}{1 \text{ gal water}} \times \frac{60 \text{ min}}{1 \text{ hr}} \times 0.0005\% \text{ (drift)} = \frac{1,051 \text{ lb water}}{\text{hr}}$$

PM Emissions

$$\frac{1,051 \text{ lb water}}{1 \text{ hr}} \times \frac{4,000 \text{ lb PM}}{1E+6 \text{ lb water}} = \frac{4.21 \text{ lb PM}}{\text{hr}} = \frac{18 \text{ ton PM}}{\text{yr}}$$

PM10 Emissions

$$\frac{4.21 \text{ lb}}{\text{hr}} \times \frac{0.308 \text{ lb PM10}^*}{\text{lb PM}} = \frac{1.29 \text{ lb PM10}}{\text{hr}} = \frac{5.67 \text{ ton PM10}}{\text{yr}}$$

* See size fraction calculation on next page

PM10 Multiplier Calculation

water TDS
 calcium carbonate density
 volume of a sphere

4,000 ppm
 2.7 g/cc
 $V = 4/3 \cdot \pi \cdot r^3$

Reference

Upper estimate
 Perry's Chemical Engineer's Handbook, Sixth Edition, p. 3-10.

Water Drop Size Distribution*

| Droplet | | Water Droplet | | Solids | | | % mass <10 microns |
|------------------|--------|---------------|-------------|-------------|--------------|------------------|--------------------------|
| Dia. (micron) | % mass | Vol. (cc) | Mass (g) | Mass (g) | Vol. (cc) | Dia. (micron) | |
| 22 | 0.43 | 5.6E-09 | 5.6E-09 | 2.2E-11 | 2.0E-11 | 3.4 | 9.63 |
| 29 | 1.49 | 1.3E-08 | 1.3E-08 | 5.1E-11 | 4.6E-11 | 4.5 | |
| 44 | 3.76 | 4.5E-08 | 4.5E-08 | 1.8E-10 | 1.6E-10 | 6.8 | |
| 58 | 2.09 | 1.0E-07 | 1.0E-07 | 4.1E-10 | 3.7E-10 | 8.9 | |
| 65 | 1.86 | 1.4E-07 | 1.4E-07 | 5.8E-10 | 5.2E-10 | 10.0 | |
| 87 | 1.56 | 3.4E-07 | 3.4E-07 | 1.4E-09 | 1.3E-09 | 13.4 | |
| 108 | 1.43 | 6.6E-07 | 6.6E-07 | 2.6E-09 | 2.4E-09 | 16.6 | |
| 120 | 1.26 | 9.0E-07 | 9.0E-07 | 3.6E-09 | 3.3E-09 | 18.4 | |
| 132 | 1.09 | 1.2E-06 | 1.2E-06 | 4.8E-09 | 4.4E-09 | 20.3 | |
| 144 | 1.32 | 1.6E-06 | 1.6E-06 | 6.3E-09 | 5.7E-09 | 22.1 | |
| 174 | 5.81 | 2.8E-06 | 2.8E-06 | 1.1E-08 | 1.0E-08 | 26.7 | |
| 300 | 5.04 | 1.4E-05 | 1.4E-05 | 5.7E-08 | 5.1E-08 | 46.1 | |
| 450** | 4.17 | 4.8E-05 | 4.8E-05 | 1.9E-07 | 1.7E-07 | 69.1 | |
| Total | 31.3 | | | | | | |

PM10/PM multiplier = 0.308

* Effects of Pathogenic and Toxic Material Transport Via Cooling Device Drift - Vol. 1 Technical Report. EPA 600/7-79-251a, Nov. 1979.

** Maximum droplet size governed by atmospheric dispersion.

VIII. EMERGENCY DIESEL ENGINES

S42 Emergency Diesel Engine Driven Generator

An Emergency Diesel Engine Driven Generator will be installed at the Facility to provide electric power for safe plant shutdown and critical load operation in the event of loss of the electrical grid. Operation of the generator will be limited to weekly testing and emergency use.

Design Data

| | |
|---------------------------|---------------|
| Generator size | 1500 KW |
| Heat Rate | 16.5 MMBtu/Hr |
| Annual Hours of Operation | 500 hr/yr |
| Fuel Flow: | 119 gal/hr |
| Annual Fuel: | 59,500 gal |

Emissions

CO, NOx, PM, and PM10 emissions are based on the applicable NSPS Subpart IIII limits. VOC emissions are based on a vendor cut-sheet for a Tier I compliant non-road diesel engine rated more than 560 kW. SO2 emissions are calculated assuming a fuel sulfur content of 15 ppm. H2SO4 emissions are calculated based on SO2 emissions and an assumed oxidation rate of 20%.

| | |
|----------|---------|
| CO | |
| g/kWhr | 3.50 |
| lb/hr | 12 |
| ton/year | 2.89 |
| NOx | |
| g/kWhr | 6.40 |
| lb/hr | 21 |
| ton/year | 5.29 |
| SO2 | |
| lb/MMBtu | 1.6E-03 |
| lb/hr | 0.026 |
| ton/year | 6.6E-03 |
| PM | |
| g/kWhr | 0.20 |
| lb/hr | 0.66 |
| ton/year | 0.17 |
| PM10 | |
| g/kWhr | 0.20 |
| lb/hr | 0.66 |
| ton/year | 0.17 |
| VOC | |
| lb/MMBtu | 0.090 |
| lb/hr | 1.49 |
| ton/year | 0.37 |
| H2SO4 | |
| lb/MMBtu | 4.9E-04 |
| lb/hr | 8.1E-03 |
| ton/year | 2.0E-03 |

S43 Emergency Diesel Engine Driven Firewater Pump

The Facility will have a Diesel Engine Driven Firewater Pump for emergency situations. Operation of the firewater pump will be limited to weekly testing and emergency use.

Design Data

| | |
|----------------------------|---------------|
| Firewater pump size: | 450 hp |
| Heat Rate: | 3.15 MMBtu/hr |
| Annual Hours of Operation: | 150 hours |
| Fuel Flow: | 23 gal/hr |
| Annual Fuel: | 3,404 gal |

Emissions

The EPA AP-42, Table 3.3-1 emission factors are used to estimate VOC emissions. NSPS Subpart IIII limits are used to estimate CO, NOx, PM, and PM10 emissions. SO2 emissions are calculated assuming a fuel sulfur content of 15 ppm. H2SO4 emissions are calculated based on SO2 emissions and an assumed oxidation rate of 2.5%.

CO

| | |
|----------|------|
| g./HP-hr | 2.6 |
| lb/hr | 2.58 |
| ton/year | 0.19 |

NOx

| | |
|----------|------|
| g./HP-hr | 3.0 |
| lb/hr | 2.98 |
| ton/year | 0.22 |

SO2

| | |
|----------|---------|
| lb/MMBtu | 1.6E-03 |
| lb/hr | 5.0E-03 |
| ton/year | 3.8E-04 |

PM

| | |
|----------|-------|
| g./HP-hr | 0.15 |
| lb/hr | 0.15 |
| ton/year | 0.011 |

PM10

| | |
|----------|-------|
| g./HP-hr | 0.15 |
| lb/hr | 0.15 |
| ton/year | 0.011 |

VOC

| | |
|----------|-------|
| lb/MMBtu | 0.35 |
| lb/hr | 1.10 |
| ton/year | 0.083 |

H2SO4

| | |
|----------|---------|
| lb/MMBtu | 4.9E-04 |
| lb/hr | 1.5E-03 |
| ton/year | 1.2E-04 |

XI. STORAGE TANKS

Emissions from the storage tanks have been calculated in two ways, per EPA TANKS 4.09 for average conditions and with AP-42 for maximum hourly conditions.

ANNUAL EMISSION

Annual emissions are calculated using the EPA TANKS program version 4.09. Printouts of the results for each of the tanks follow these emissions calculations.

MAXIMUM HOURLY EMISSIONS

The Maximum Hourly Emissions are calculated using the EPA AP-42, Section 7.1 emission factor calculation for annual working losses.

Emission factor (Annual basis):
$$L_W = 0.0010 M_V P_{VA} Q K_N K_P$$

where:

Lw= working loss, lb/yr
 Mv= vapor molecular weight, lb/lb-mole
 Pva= vapor pressure at daily average liquid surface temperature, psia
 Q= annual net throughput, bbl year
 Kn= turnover factor = 1 for turnovers less than or equal to 36
 Kp= working loss product factor = 1 for gasoline and diesel fuel

Revised to estimate hourly emissions:

Emission factor (Hourly basis):
$$L_W = 0.0010 M_V P_{VA} Q$$

where:

Lw= working loss, lb/hr
 Mv= vapor molecular weight, lb/lb-mole
 Pva= vapor pressure at time of tank filling, psia
 Q= hourly throughput, bbl

S46 2,000 Gallon Diesel Fuel Storage Tank

The Facility will have a 2,000 gallon horizontal storage tank for diesel fuel for use in the Emergency Diesel Fuel-Fired Generator. The tank will be equipped with conservation vent valves.

Tank System Design Data

Tank Shell Length = 10 ft
 Tank Diameter = 12 ft

Emissions

Annual breathing and working emissions for the tank were calculated per EPA TANKS 4.09 (see attached). The maximum hourly VOC emissions from the tank are calculated using AP-42 described above.

EPA Tanks Summary:

Annual VOC Emissions: 1.71 lb/yr

Tank Maximum Hourly Emissions:

Emission factor:

$$L_W = 0.0010 M_V P_{VA} Q$$

where:

Lw= working loss, lb/hr = 130 lb/lb-mole
 Mv= vapor molecular weight, lb/lb-mole = 0.022 psia
 Pva= vapor pressure at time of tank filling, psia = 0.14 bbl
 Q= hourly throughput, bbl

Emission factor: 3.9E-04 lb/hr

VOC = 3.9E-04 lb/hr
 VOC = 8.6E-04 tons/yr

S47 500 Gallon Diesel Fuel Storage Tank

The Facility will have a 500 gallon diesel fuel horizontal storage tank for use in the Emergency Diesel Fuel-Fired Firewater Pump. The tank will be equipped with conservation vent valves.

Tank System Design Data

Tank Shell Length = 8.83 ft
 Tank Diameter = 6 ft

Emissions

Annual breathing and working emissions for the tank were calculated per EPA TANKS 4.09 (see attached). The maximum hourly VOC emissions from the tank are calculated using AP-42 described above.

EPA Tanks Summary:

Annual VOC Emissions: 0.26 lb/yr

Tank Maximum Hourly Emissions:

Emission factor:

$$L_W = 0.0010 M_V P_{VA} Q$$

where:

| | | | | |
|------|--|---|---------|------------|
| Lw= | working loss, lb/hr | = | 130 | lb/lb-mole |
| Mv= | vapor molecular weight, lb/lb-mole | = | 0.022 | psia |
| Pva= | vapor pressure at time of tank filling, psia | = | 6.8E-03 | bbf |
| Q= | hourly throughput, bbf | | | |

Emission factor: 1.9E-05 lb/hr

VOC = 1.9E-05 lb/hr

VOC = 1.3E-04 tons/yr

S48 150 Gallon Unleaded Gasoline Storage Tank

The Facility will have a 150 gallon unleaded gasoline horizontal storage tank for use in plant vehicles. A fuel dispensing station will be located adjacent to the storage tank. The tank will be equipped with conservation vent valves.

Tank System Design Data

Tank Shell Length = 5 ft
 Tank Diameter = 3 ft

Emissions

Annual breathing and working emissions for the tank were calculated per EPA TANKS 4.09 (see attached). The maximum hourly VOC emissions from the tank are calculated using AP-42 described above.

EPA Tanks Summary:

Annual VOC Emissions: 65.24 lb/yr

Tank Maximum Hourly Emissions:

Emission factor:

$$L_W = 0.0010 M_V P_{VA} Q$$

where:

| | | | | |
|------|--|---|---------|------------|
| Lw= | working loss, lb/hr | = | 66 | lb/lb-mole |
| Mv= | vapor molecular weight, lb/lb-mole | = | 10.5 | psia |
| Pva= | vapor pressure at time of tank filling, psia | = | 8.6E-03 | bbf |
| Q= | hourly throughput, bbf | | | |

Emission factor: 5.9E-03 lb/hr

VOC = 5.9E-03 lb/hr

VOC = 0.033 tons/yr

S01 Boiler (Coal-Fired) Stack

Megawatts (gross) 815
 Load Condition 100%
 Megawatts (Net) 750
 Coal flow (lb/hr) 827,471
 Coal Flow (tons/hr) 414
 Heat Input (mmBtu/hr, HHV) 6,785

| CAS | Pollutant | Emission Factor | Emission Factor Units | Emission Rate (lb/hr) | Min. Control Efficiency | Notes | Controlled Emission Rate (lb/hr) | Emission Rate (tons/year) |
|-----------|------------------------------|-----------------|-----------------------|-----------------------|-------------------------|-------|----------------------------------|---------------------------|
| 7647-01-0 | HCL | 0.027 | lb/MMBtu | 183 | 95% | A | 9.16 | 40 |
| 7664-39-3 | HF | .0134 | lb/MMBtu | 91 | 95% | A | 4.55 | 20 |
| 7440-36-0 | Antimony (Sb) | 1.4E-04 | lb/MMBtu | 0.95 | 99% | A | 9.5E-03 | 0.042 |
| 7440-38-2 | Arsenic (As) | 3.1E-03 | lb/MMBtu | 21 | 98% | A | 0.21 | 0.92 |
| 7440-41-7 | Beryllium (Be) | 2.1E-04 | lb/MMBtu | 1.42 | 99% | A | 0.014 | 0.062 |
| 7440-43-9 | Cadmium (Cd) | 3.2E-05 | lb/MMBtu | 0.22 | 99% | A | 2.2E-03 | 0.010 |
| 7440-47-3 | Chromium (Cr) | 1.4E-03 | lb/MMBtu | 9.50 | 99% | A | 0.095 | 0.42 |
| 50-00-0 | Formaldehyde | 2.4E-04 | lb/ton | 0.10 | | B | 0.10 | 0.43 |
| 7439-96-5 | Manganese (Mn) | 0.013 | lb/MMBtu | 88 | 99% | A | 0.88 | 3.86 |
| 7439-97-6 | Mercury (Hg) | 1.5E-05 | lb/mwhr | 0.012 | | C | 0.012 | 0.054 |
| 7440-02-0 | Nickel (Ni) | 1.4E-03 | lb/MMBtu | 9.50 | 99% | A | 0.095 | 0.42 |
| 7782-49-2 | Selenium (Se) | 2.0E-04 | lb/MMBtu | 1.36 | 99% | A | 0.014 | 0.059 |
| 7440-48-4 | Cobalt (Co) | 5.0E-04 | lb/MMBtu | 3.39 | 99% | A | 0.034 | 0.15 |
| 92-52-4 | PAH - Biphenyl | 1.7E-06 | lb/ton | 7.03E-04 | | D | 7.0E-04 | 3.1E-03 |
| 83-32-9 | PAH - Acenaphthene | 5.1E-07 | lb/ton | 2.11E-04 | | D | 2.1E-04 | 9.2E-04 |
| 208-96-8 | PAH - Acenaphthylene | 2.5E-07 | lb/ton | 1.03E-04 | | D | 1.0E-04 | 4.5E-04 |
| 120-12-7 | PAH - Anthracene | 2.1E-07 | lb/ton | 8.89E-05 | | D | 8.7E-05 | 3.8E-04 |
| 56-55-3 | PAH - Benzo(a)anthracene | 8.0E-08 | lb/ton | 3.31E-05 | | D | 3.3E-05 | 1.4E-04 |
| 50-32-8 | PAH - Benzo(a)pyrene | 3.8E-08 | lb/ton | 1.57E-05 | | D | 1.6E-05 | 6.9E-05 |
| 205-99-2 | PAH - Benzo(b)fluoranthene | 1.1E-07 | lb/ton | 4.55E-05 | | D | 4.6E-05 | 2.0E-04 |
| 205-82-3 | PAH - Benzo(i)fluoranthene | 1.1E-07 | lb/ton | 4.55E-05 | | D | 4.6E-05 | 2.0E-04 |
| 207-08-9 | PAH - Benzo(k)fluoranthene | 1.1E-07 | lb/ton | 4.55E-05 | | D | 4.6E-05 | 2.0E-04 |
| 191-24-2 | PAH - Benzo(g,h,i)perylene | 2.7E-08 | lb/ton | 1.12E-05 | | D | 1.1E-05 | 4.9E-05 |
| 218-01-9 | PAH - Chrysene | 1.0E-07 | lb/ton | 4.14E-05 | | D | 4.1E-05 | 1.8E-04 |
| 206-44-0 | PAH - Fluoranthene | 7.1E-07 | lb/ton | 2.94E-04 | | D | 2.9E-04 | 1.3E-03 |
| 86-73-7 | PAH - Fluorene | 9.1E-07 | lb/ton | 3.76E-04 | | D | 3.8E-04 | 1.6E-03 |
| 193-39-5 | PAH - Indeno(1,2,3-cd)pyrene | 6.1E-08 | lb/ton | 2.52E-05 | | D | 2.5E-05 | 1.1E-04 |
| 91-20-3 | PAH - Naphthalene | 1.3E-05 | lb/ton | 5.38E-03 | | D | 5.4E-03 | 0.024 |
| 85-01-8 | PAH - Phenanthrene | 2.7E-06 | lb/ton | 1.12E-03 | | D | 1.1E-03 | 4.9E-03 |
| 129-00-0 | PAH - Pyrene | 3.3E-07 | lb/ton | 1.37E-04 | | D | 1.4E-04 | 6.0E-04 |
| 3697-24-3 | PAH - 5-Methyl chrysene | 2.2E-08 | lb/ton | 9.10E-06 | | D | 9.1E-06 | 4.0E-05 |
| 75-07-0 | Acetaldehyde | 5.7E-04 | lb/ton | 0.24 | | B | 0.24 | 1.03 |
| 98-86-2 | Acetophenone | 1.5E-05 | lb/ton | 6.21E-03 | | B | 6.2E-03 | 0.027 |
| 107-02-8 | Acrolein | 2.9E-04 | lb/ton | 0.12 | | B | 0.12 | 0.53 |
| 71-43-2 | Benzene | 1.3E-03 | lb/ton | 0.54 | | B | 0.54 | 2.36 |
| 100-44-7 | Benzyl chloride | 7.0E-04 | lb/ton | 0.29 | | B | 0.29 | 1.27 |
| 117-81-7 | Bis(2-ethylhexyl)phthalate | 7.3E-05 | lb/ton | 0.030 | | B | 0.030 | 0.13 |
| 75-25-2 | Bromoform | 3.9E-05 | lb/ton | 0.016 | | B | 0.016 | 0.071 |
| 75-15-0 | Carbon disulfide | 1.3E-04 | lb/ton | 0.054 | | B | 0.054 | 0.24 |
| 532-27-4 | 2-Chloroacetophenone | 7.0E-06 | lb/ton | 2.90E-03 | | B | 2.9E-03 | 0.013 |
| 108-90-7 | Chlorobenzene | 2.2E-05 | lb/ton | 9.10E-03 | | B | 9.1E-03 | 0.040 |
| 67-66-3 | Chloroform | 5.9E-05 | lb/ton | 0.024 | | B | 0.024 | 0.11 |
| 98-82-8 | Cumene | 5.3E-06 | lb/ton | 2.19E-03 | | B | 2.2E-03 | 9.6E-03 |
| 57-12-5 | Cyanide | 1.3E-05 | lb/MMBtu | 0.088 | | E | 0.088 | 0.39 |
| 121-14-2 | 2,4-Dinitrotoluene | 2.8E-07 | lb/ton | 1.16E-04 | | B | 1.2E-04 | 5.1E-04 |
| 77-78-1 | Dimethyl sulfate | 4.8E-05 | lb/ton | 0.020 | | B | 0.020 | 0.087 |
| 100-41-4 | Ethyl benzene | 9.4E-05 | lb/ton | 0.039 | | B | 0.039 | 0.17 |
| 75-00-3 | Ethyl chloride | 4.2E-05 | lb/ton | 0.017 | | B | 0.017 | 0.076 |
| 107-06-2 | Ethylene dichloride | 4.0E-05 | lb/ton | 0.017 | | B | 0.017 | 0.072 |
| 106-93-4 | Ethylene dibromide | 1.2E-06 | lb/ton | 4.96E-04 | | B | 5.0E-04 | 2.2E-03 |
| 110-54-3 | Hexane | 6.7E-05 | lb/ton | 0.028 | | B | 0.028 | 0.12 |
| 78-59-1 | Isophorone | 5.8E-04 | lb/ton | 0.24 | | B | 0.24 | 1.05 |
| 74-95-3 | Methyl bromide | 1.6E-04 | lb/ton | 0.066 | | B | 0.066 | 0.29 |
| 74-87-3 | Methyl chloride | 5.3E-04 | lb/ton | 0.22 | | B | 0.22 | 0.96 |
| 78-93-3 | Methyl ethyl ketone | 3.9E-04 | lb/ton | 0.16 | | B | 0.16 | 0.71 |
| 60-34-4 | Methyl hydrazine | 1.7E-04 | lb/ton | 0.070 | | B | 7.0E-02 | 0.31 |
| 80-62-6 | Methyl methacrylate | 2.0E-05 | lb/ton | 8.27E-03 | | B | 8.3E-03 | 0.036 |
| 1634-04-4 | Methyl tert butyl ether | 3.5E-05 | lb/ton | 0.014 | | B | 1.4E-02 | 0.063 |
| 75-09-2 | Methylene chloride | 2.9E-04 | lb/ton | 0.12 | | B | 0.12 | 0.53 |
| 108-95-2 | Phenol | 1.6E-05 | lb/ton | 6.62E-03 | | B | 6.6E-03 | 0.029 |
| 123-38-6 | Propionaldehyde | 3.8E-04 | lb/ton | 0.157 | | B | 0.16 | 0.69 |
| 127-18-4 | Tetrachloroethylene | 4.3E-05 | lb/ton | 0.018 | | B | 0.018 | 0.078 |
| 108-88-3 | Toluene | 2.4E-04 | lb/ton | 0.099 | | B | 0.10 | 0.43 |
| 71-55-6 | 1,1,1-Trichloroethane | 2.0E-05 | lb/ton | 8.27E-03 | | B | 8.3E-03 | 0.036 |
| 100-42-5 | Styrene | 2.5E-05 | lb/ton | 0.010 | | B | 0.010 | 0.045 |
| 1330-20-7 | Xylenes | 3.7E-05 | lb/ton | 0.015 | | B | 0.015 | 0.067 |
| 108-05-4 | Vinyl acetate | 7.6E-06 | lb/ton | 3.14E-03 | | B | 3.1E-03 | 0.014 |
| 1746-01-6 | 12,3,7,8-TCDD | 1.43E-11 | lb/ton | 5.92E-09 | | F | 5.9E-09 | 2.6E-08 |
| | | | | | | | TOTAL | 79 |

A = Values based upon coal concentration data from COALQUAL.
 B = Emission Factor Source: AP-42, Table 1.1-14, 5th edition (9/98)
 C = Emission Factor Source: proposed emission limit
 D = Emission Factor Source: AP-42, Table 1.1-13, 5th edition (9/98)
 E = Emission Factor Source: EEI EPRI Subcommittee Recommendation
 F = Emission Factor Source: AP-42, Table 1.1-12, 5th edition (9/98)

S03 Main Auxiliary Boiler (Natural Gas-Fired)

| | |
|---|-------|
| Heat Input (MMBtu/hr) | 400 |
| Fuel Heating Value (Btu/ft ³) | 1,020 |
| Fuel Flow (MMft ³ /hr) | 0.392 |
| Annual Operating Hours | 8760 |
| Annual Fuel (MMft ³ /yr) | 3,435 |

| CAS | Pollutant | Emission Factor | Units | Notes | Emission Rates | |
|------------|--------------------------------|-----------------|---------|-------|----------------|-----------|
| | | | | | lb/hr | tons/year |
| 91-57-6 | 2-Methylnaphthalene | 2.40E-05 | lb/MMCF | G | 9.4E-06 | 4.1E-05 |
| 56-49-5 | 3-Methylchloranthrene | 1.80E-06 | lb/MMCF | G | 7.1E-07 | 3.1E-06 |
| na | 7,12-Dimethylbenz(a)anthracene | 1.60E-05 | lb/MMCF | G | 6.3E-06 | 2.7E-05 |
| 83-32-9 | Acenaphthene | 1.80E-06 | lb/MMCF | G | 7.1E-07 | 3.1E-06 |
| 203-96-8 | Acenaphthylene | 1.80E-06 | lb/MMCF | G | 7.1E-07 | 3.1E-06 |
| 120-12-7 | Anthracene | 2.40E-06 | lb/MMCF | G | 9.4E-07 | 4.1E-06 |
| 56-55-3 | Benz(a)anthracene | 1.80E-06 | lb/MMCF | G | 7.1E-07 | 3.1E-06 |
| 71-43-2 | Benzene | 2.10E-03 | lb/MMCF | G | 8.2E-04 | 3.6E-03 |
| 50-32-8 | Benzo(a)pyrene | 1.20E-06 | lb/MMCF | G | 4.7E-07 | 2.1E-06 |
| 205-99-2 | Benzo(b)fluoranthene | 1.80E-06 | lb/MMCF | G | 7.1E-07 | 3.1E-06 |
| 191-24-2 | Benzo(g,h,i)perylene | 1.20E-06 | lb/MMCF | G | 4.7E-07 | 2.1E-06 |
| 205-82-3 | Benzo(k)fluoranthene | 1.80E-06 | lb/MMCF | G | 7.1E-07 | 3.1E-06 |
| 106-97-8 | Butane | 2.10E+00 | lb/MMCF | G | 8.2E-01 | 3.6E+00 |
| 218-01-9 | Chrysene | 1.80E-06 | lb/MMCF | G | 7.1E-07 | 3.1E-06 |
| 53-70-3 | Dibenzo(a,h)anthracene | 1.20E-06 | lb/MMCF | G | 4.7E-07 | 2.1E-06 |
| 25321-22-6 | Dichlorobenzene | 1.20E-03 | lb/MMCF | G | 4.7E-04 | 2.1E-03 |
| 74-84-0 | Ethane | 3.10E+00 | lb/MMCF | G | 1.2E+00 | 5.3E+00 |
| 206-44-0 | Fluoranthene | 3.00E-06 | lb/MMCF | G | 1.2E-06 | 5.2E-06 |
| 86-73-7 | Fluorene | 2.80E-06 | lb/MMCF | G | 1.1E-06 | 4.8E-06 |
| 50-00-0 | Formaldehyde | 7.50E-02 | lb/MMCF | G | 2.9E-02 | 1.3E-01 |
| 110-54-3 | Hexane | 1.80E+00 | lb/MMCF | G | 7.1E-01 | 3.1E+00 |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 1.80E-06 | lb/MMCF | G | 7.1E-07 | 3.1E-06 |
| 91-20-3 | Naphthalene | 6.10E-04 | lb/MMCF | G | 2.4E-04 | 1.0E-03 |
| 109-66-0 | Pentane | 2.60E+00 | lb/MMCF | G | 1.0E+00 | 4.5E+00 |
| 85-01-8 | Phenanthrene | 1.70E-05 | lb/MMCF | G | 6.7E-06 | 2.9E-05 |
| 74-98-6 | Propane | 1.60E+00 | lb/MMCF | G | 6.3E-01 | 2.7E+00 |
| 129-00-0 | Pyrene | 5.00E-06 | lb/MMCF | G | 2.0E-06 | 8.6E-06 |
| 108-88-3 | Toluene | 3.40E-03 | lb/MMCF | G | 1.3E-03 | 5.8E-03 |
| 7440-38-2 | Arsenic | 2.00E-04 | lb/MMCF | H | 7.8E-05 | 3.4E-04 |
| 7440-39-3 | Barium | 4.40E-03 | lb/MMCF | H | 1.7E-03 | 7.6E-03 |
| 7440-41-7 | Beryllium | 1.20E-05 | lb/MMCF | H | 4.7E-06 | 2.1E-05 |
| 7440-43-9 | Cadmium | 1.10E-03 | lb/MMCF | H | 4.3E-04 | 1.9E-03 |
| 7440-47-3 | Chromium | 1.40E-03 | lb/MMCF | H | 5.5E-04 | 2.4E-03 |
| 7440-48-4 | Cobalt | 8.40E-05 | lb/MMCF | H | 3.3E-05 | 1.4E-04 |
| 7440-50-8 | Copper | 8.50E-04 | lb/MMCF | H | 3.3E-04 | 1.5E-03 |
| 7439-96-5 | Manganese | 3.80E-04 | lb/MMCF | H | 1.5E-04 | 6.5E-04 |
| 7439-97-6 | Mercury | 2.60E-04 | lb/MMCF | H | 1.0E-04 | 4.5E-04 |
| 7439-98-7 | Molybdenum | 1.10E-03 | lb/MMCF | H | 4.3E-04 | 1.9E-03 |
| 7440-02-0 | Nickel | 2.10E-03 | lb/MMCF | H | 8.2E-04 | 3.6E-03 |
| 7782-49-2 | Selenium | 2.40E-05 | lb/MMCF | H | 9.4E-06 | 4.1E-05 |
| 7440-62-2 | Vanadium | 2.30E-03 | lb/MMCF | H | 9.0E-04 | 4.0E-03 |
| 7440-66-6 | Zinc | 2.90E-02 | lb/MMCF | H | 1.1E-02 | 5.0E-02 |
| TOTAL | | | | | | 19 |

G = Emission Factor Source: AP-42, Table 1.4-3, 5th edition (7/98)

H = Emission Factor Source: AP-42, Table 1.4-4, 5th edition (7/98)

S04 Steam Boiler #1 (Natural Gas-Fired)
 S05 Steam Boiler #2 (Natural Gas-Fired)
 S06 Steam Boiler #3 (Natural Gas-Fired)

Heat Input (MMBtu/hr) S04 350 S05 350 S06 350
 Fuel Heating Value (Btu/ft³) 1,020 1,020 1,020
 Fuel Flow (MMcf/yr) 0.343 0.343 0.343
 Annual Operating Hours 8760 8760 8760
 Annual Fuel (MMcf/yr) 3,006 3,006 3,006

| CAS | Pollutant | Emission Factor | Units | Notes | Emission Rates S04 | | | Emission Rates S05 | | | Emission Rates S06 | | | Combined Emission Rates | | |
|------------|--------------------------------|-----------------|---------|-------|--------------------|-----------|---------|--------------------|---------|-----------|--------------------|-----------|---------|-------------------------|-------|-----------|
| | | | | | lb/hr | tons/year | lb/hr | tons/year | lb/hr | tons/year | lb/hr | tons/year | lb/hr | tons/year | lb/hr | tons/year |
| 91-57-6 | 2-Methylnaphthalene | 2.40E-05 | lb/MMCF | | 8.2E-06 | 3.6E-05 | 8.2E-06 | 3.6E-05 | 8.2E-06 | 3.6E-05 | 8.2E-06 | 3.6E-05 | 2.5E-05 | 1.1E-04 | | |
| 56-49-5 | 3-Methylchloranthrene | 1.80E-06 | lb/MMCF | | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 1.9E-06 | 8.1E-06 | | |
| na | 7,12-Dimethylbenz(a)anthracene | 1.60E-05 | lb/MMCF | | 5.5E-05 | 2.4E-05 | 5.5E-05 | 2.4E-05 | 5.5E-05 | 2.4E-05 | 5.5E-05 | 2.4E-05 | 1.6E-05 | 7.2E-05 | | |
| 83-32-9 | Acenaphthene | 1.80E-06 | lb/MMCF | | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 1.9E-06 | 8.1E-06 | | |
| 203-99-8 | Acenaphthylene | 1.80E-06 | lb/MMCF | | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 1.9E-06 | 8.1E-06 | | |
| 120-12-7 | Anthracene | 2.40E-06 | lb/MMCF | | 8.2E-07 | 3.6E-06 | 8.2E-07 | 3.6E-06 | 8.2E-07 | 3.6E-06 | 8.2E-07 | 3.6E-06 | 2.5E-06 | 1.1E-05 | | |
| 56-55-3 | Benzo(a)anthracene | 1.80E-06 | lb/MMCF | | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 1.9E-06 | 8.1E-06 | | |
| 71-43-2 | Benzo(b)anthracene | 2.10E-03 | lb/MMCF | | 7.2E-04 | 3.2E-03 | 7.2E-04 | 3.2E-03 | 7.2E-04 | 3.2E-03 | 7.2E-04 | 3.2E-03 | 2.2E-03 | 9.5E-03 | | |
| 50-32-8 | Benzo(k)fluoranthene | 1.20E-06 | lb/MMCF | | 4.1E-07 | 1.8E-06 | 4.1E-07 | 1.8E-06 | 4.1E-07 | 1.8E-06 | 4.1E-07 | 1.8E-06 | 1.2E-06 | 5.4E-06 | | |
| 205-99-2 | Benzofluoranthene | 1.80E-06 | lb/MMCF | | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 1.9E-06 | 8.1E-06 | | |
| 191-24-2 | Benzofluoranthene | 1.20E-06 | lb/MMCF | | 4.1E-07 | 1.8E-06 | 4.1E-07 | 1.8E-06 | 4.1E-07 | 1.8E-06 | 4.1E-07 | 1.8E-06 | 1.2E-06 | 5.4E-06 | | |
| 205-82-3 | Benzofluoranthene | 1.80E-06 | lb/MMCF | | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 1.9E-06 | 8.1E-06 | | |
| 106-97-8 | Butane | 2.10E+00 | lb/MMCF | | 7.2E-01 | 3.2E+00 | 7.2E-01 | 3.2E+00 | 7.2E-01 | 3.2E+00 | 7.2E-01 | 3.2E+00 | 2.2E+00 | 9.5E+00 | | |
| 218-01-9 | Chrysene | 1.80E-06 | lb/MMCF | | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 1.9E-06 | 8.1E-06 | | |
| 53-70-3 | Dibenzofluoranthene | 1.20E-06 | lb/MMCF | | 4.1E-07 | 1.8E-06 | 4.1E-07 | 1.8E-06 | 4.1E-07 | 1.8E-06 | 4.1E-07 | 1.8E-06 | 1.2E-06 | 5.4E-06 | | |
| 25321-22-6 | Dibenzofluoranthene | 1.20E-03 | lb/MMCF | | 4.1E-04 | 1.8E-03 | 4.1E-04 | 1.8E-03 | 4.1E-04 | 1.8E-03 | 4.1E-04 | 1.8E-03 | 1.2E-03 | 5.4E-03 | | |
| 74-84-0 | Ethane | 3.10E+00 | lb/MMCF | | 1.1E+00 | 4.7E+00 | 1.1E+00 | 4.7E+00 | 1.1E+00 | 4.7E+00 | 1.1E+00 | 4.7E+00 | 3.2E+00 | 1.4E+01 | | |
| 206-44-0 | Fluoranthene | 3.00E-06 | lb/MMCF | | 1.0E-06 | 4.5E-06 | 1.0E-06 | 4.5E-06 | 1.0E-06 | 4.5E-06 | 1.0E-06 | 4.5E-06 | 3.1E-06 | 1.4E-05 | | |
| 86-73-7 | Fluorene | 2.80E-06 | lb/MMCF | | 9.6E-07 | 4.2E-06 | 9.6E-07 | 4.2E-06 | 9.6E-07 | 4.2E-06 | 9.6E-07 | 4.2E-06 | 2.9E-06 | 1.3E-05 | | |
| 50-03-0 | Formaldehyde | 7.50E-02 | lb/MMCF | | 2.6E-02 | 1.1E-01 | 2.6E-02 | 1.1E-01 | 2.6E-02 | 1.1E-01 | 2.6E-02 | 1.1E-01 | 7.7E-02 | 3.4E-01 | | |
| 110-54-3 | Hexene | 1.80E+00 | lb/MMCF | | 6.2E-01 | 2.7E+00 | 6.2E-01 | 2.7E+00 | 6.2E-01 | 2.7E+00 | 6.2E-01 | 2.7E+00 | 1.9E+00 | 8.1E+00 | | |
| 193-39-5 | Indeno(1,2,3-cd)pyrene | 1.80E-06 | lb/MMCF | | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 6.2E-07 | 2.7E-06 | 1.9E-06 | 8.1E-06 | | |
| 91-20-3 | Naphthalene | 6.10E-04 | lb/MMCF | | 2.1E-04 | 9.2E-04 | 2.1E-04 | 9.2E-04 | 2.1E-04 | 9.2E-04 | 2.1E-04 | 9.2E-04 | 6.3E-04 | 2.6E-03 | | |
| 109-66-0 | Pentane | 2.60E+00 | lb/MMCF | | 8.9E-01 | 3.9E+00 | 8.9E-01 | 3.9E+00 | 8.9E-01 | 3.9E+00 | 8.9E-01 | 3.9E+00 | 2.7E+00 | 1.2E+01 | | |
| 74-98-6 | Phenanthrene | 1.70E-05 | lb/MMCF | | 5.8E-06 | 2.6E-05 | 5.8E-06 | 2.6E-05 | 5.8E-06 | 2.6E-05 | 5.8E-06 | 2.6E-05 | 1.8E-05 | 7.7E-05 | | |
| 129-00-0 | Pyrene | 1.60E+00 | lb/MMCF | | 5.5E-01 | 2.4E+00 | 5.5E-01 | 2.4E+00 | 5.5E-01 | 2.4E+00 | 5.5E-01 | 2.4E+00 | 1.6E+00 | 7.2E+00 | | |
| 108-68-3 | Toluene | 3.40E-03 | lb/MMCF | | 1.2E-03 | 5.1E-03 | 1.2E-03 | 5.1E-03 | 1.2E-03 | 5.1E-03 | 1.2E-03 | 5.1E-03 | 3.5E-03 | 1.5E-02 | | |
| 7440-38-2 | Arsenic | 2.00E-04 | lb/MMCF | | 6.9E-05 | 3.0E-04 | 6.9E-05 | 3.0E-04 | 6.9E-05 | 3.0E-04 | 6.9E-05 | 3.0E-04 | 2.1E-04 | 9.0E-04 | | |
| 7440-39-3 | Barium | 4.40E-03 | lb/MMCF | J | 1.5E-03 | 6.6E-03 | 1.5E-03 | 6.6E-03 | 1.5E-03 | 6.6E-03 | 1.5E-03 | 6.6E-03 | 4.5E-03 | 2.0E-02 | | |
| 7440-41-7 | Beryllium | 1.20E-05 | lb/MMCF | J | 4.1E-06 | 1.8E-05 | 4.1E-06 | 1.8E-05 | 4.1E-06 | 1.8E-05 | 4.1E-06 | 1.8E-05 | 1.2E-05 | 5.4E-05 | | |
| 7440-43-9 | Cadmium | 1.10E-03 | lb/MMCF | J | 3.8E-04 | 1.7E-03 | 3.8E-04 | 1.7E-03 | 3.8E-04 | 1.7E-03 | 3.8E-04 | 1.7E-03 | 1.1E-03 | 5.0E-03 | | |
| 7440-47-3 | Chromium | 1.40E-03 | lb/MMCF | J | 4.8E-04 | 2.1E-03 | 4.8E-04 | 2.1E-03 | 4.8E-04 | 2.1E-03 | 4.8E-04 | 2.1E-03 | 1.4E-03 | 6.3E-03 | | |
| 7440-48-4 | Cobalt | 8.40E-05 | lb/MMCF | J | 2.9E-05 | 1.3E-04 | 2.9E-05 | 1.3E-04 | 2.9E-05 | 1.3E-04 | 2.9E-05 | 1.3E-04 | 8.6E-05 | 3.8E-04 | | |
| 7440-50-8 | Copper | 8.50E-04 | lb/MMCF | J | 2.9E-04 | 1.3E-03 | 2.9E-04 | 1.3E-03 | 2.9E-04 | 1.3E-03 | 2.9E-04 | 1.3E-03 | 8.8E-04 | 3.8E-03 | | |
| 7439-96-5 | Manganese | 3.80E-04 | lb/MMCF | J | 1.3E-04 | 5.7E-04 | 1.3E-04 | 5.7E-04 | 1.3E-04 | 5.7E-04 | 1.3E-04 | 5.7E-04 | 3.9E-04 | 1.7E-03 | | |
| 7439-97-6 | Mercury | 2.60E-04 | lb/MMCF | J | 8.9E-05 | 3.9E-04 | 8.9E-05 | 3.9E-04 | 8.9E-05 | 3.9E-04 | 8.9E-05 | 3.9E-04 | 2.7E-04 | 1.2E-03 | | |
| 7439-98-7 | Molybdenum | 1.10E-03 | lb/MMCF | J | 3.8E-04 | 1.7E-03 | 3.8E-04 | 1.7E-03 | 3.8E-04 | 1.7E-03 | 3.8E-04 | 1.7E-03 | 1.1E-03 | 5.0E-03 | | |
| 7440-02-0 | Nickel | 2.10E-03 | lb/MMCF | J | 7.2E-04 | 3.2E-03 | 7.2E-04 | 3.2E-03 | 7.2E-04 | 3.2E-03 | 7.2E-04 | 3.2E-03 | 2.2E-03 | 9.5E-03 | | |
| 7782-49-2 | Selenium | 2.40E-05 | lb/MMCF | J | 8.2E-06 | 3.6E-05 | 8.2E-06 | 3.6E-05 | 8.2E-06 | 3.6E-05 | 8.2E-06 | 3.6E-05 | 2.5E-05 | 1.1E-04 | | |
| 7440-62-2 | Vanadium | 2.30E-03 | lb/MMCF | J | 7.9E-04 | 3.5E-03 | 7.9E-04 | 3.5E-03 | 7.9E-04 | 3.5E-03 | 7.9E-04 | 3.5E-03 | 2.4E-03 | 1.0E-02 | | |
| 7440-66-6 | Zinc | 2.90E-02 | lb/MMCF | J | 1.0E-02 | 4.4E-02 | 1.0E-02 | 4.4E-02 | 1.0E-02 | 4.4E-02 | 1.0E-02 | 4.4E-02 | 3.0E-02 | 1.3E-01 | | |
| | | | | | | | | | | | | | | 51 | | |
| | | | | | | | | | | | | | | TOTAL | | |

I = Emission Factor Source: AP-42, Table 1.4-3, 5th edition (7/98)
 J = Emission Factor Source: AP-42, Table 1.4-4, 5th edition (7/98)

Cold Startup of Boiler, Coal and Natural Gas

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|---|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|---------|-----------|-----------|-----------|
| Startup Time (hours) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Main Steam Flow (%MCR) | | | | | | | | | | | | | | | | |
| Coal Flow (pph) | 0 | 0 | 0 | 12,929 | 25,858 | 51,717 | 103,434 | 206,868 | 206,868 | 206,868 | 206,868 | 206,868 | 206,868 | 620,603 | 744,724 | 827,471 |
| Coal Flow (tons) | 0 | 0 | 0 | 6 | 13 | 26 | 52 | 103 | 103 | 103 | 103 | 103 | 103 | 310 | 372 | 414 |
| Natural Gas (pph) | 59,371 | 89,057 | 106,868 | 118,742 | 118,742 | 106,868 | 106,868 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Coal Heat Input (MMBtu/hr) | 0 | 0 | 0 | 106 | 212 | 424 | 848 | 1,696 | 1,696 | 1,696 | 1,696 | 1,696 | 1,696 | 5,089 | 6,107 | 6,785 |
| Natural Gas Heat Input (MMBtu/hr) | 1,187 | 1,781 | 2,137 | 2,375 | 2,375 | 2,137 | 2,137 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total Heat Input (MMBtu/hr) | 1,187 | 1,781 | 2,137 | 2,481 | 2,587 | 2,561 | 2,986 | 1,696 | 1,696 | 1,696 | 1,696 | 1,696 | 1,696 | 5,089 | 6,107 | 6,785 |
| Stack Exit Temp. (°F) | 60 | 86 | 112 | 138 | 164 | 190 | 216 | 242 | 268 | 297 | 165 | 165 | 165 | 165 | 165 | 165 |
| Stack Exit Flow (acfm) | 378,494 | 567,740 | 681,288 | 790,781 | 749,614 | 742,241 | 865,128 | 491,550 | 491,550 | 491,550 | 491,550 | 491,550 | 491,550 | 1,474,650 | 1,769,580 | 1,966,200 |
| CO (lb/MMBtu) | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.15 | 0.15 | 0.15 |
| NOx (lb/MMBtu) before SCR | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.25 | 0.25 | 0.25 |
| NOx (lb/MMBtu) after SCR | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.45 | 0.07 | 0.07 | 0.07 |
| Max coal sulfur content (%) | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% | 0.66% |
| Design coal sulfur content (%) | 0.46% | 0.46% | 0.46% | 0.46% | 0.46% | 0.46% | 0.46% | 0.46% | 0.46% | 0.46% | 0.46% | 0.46% | 0.46% | 0.46% | 0.46% | 0.46% |
| Max gas sulfur content (%) | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 | 1.5E-05 |
| SO2 (lb/MMBtu) before scrubber | 1.5E-03 | 1.5E-03 | 1.5E-03 | 1.5E-03 | 1.5E-03 | 1.5E-03 | 1.5E-03 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 |
| SO2 (lb/MMBtu) after scrubber | 1.5E-03 | 1.5E-03 | 1.5E-03 | 1.5E-03 | 1.5E-03 | 1.5E-03 | 1.5E-03 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 | 1.12 |
| PM total (lb/MMBtu) after baghouse | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 | 0.027 |
| PM10 total (lb/MMBtu) after baghouse | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 | 0.025 |
| PM filterable (lb/MMBtu) after baghouse | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 | 0.015 |
| PM10 filterable (lb/MMBtu) after baghouse | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 | 0.012 |
| VOC (lb/MMBtu) | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 |
| lead (lb/MMBtu) | 0 | 0 | 0 | 5.1E-07 | 9.8E-07 | 2.0E-06 | 3.4E-06 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 | 1.2E-05 |
| fluoride (as HF) (lb/MMBtu) | 0 | 0 | 0 | 5.6E-04 | 1.1E-03 | 2.2E-03 | 3.7E-03 | 1.3E-02 | 1.3E-02 | 1.3E-02 | 1.3E-02 | 1.3E-02 | 1.3E-02 | 6.7E-04 | 6.7E-04 | 6.7E-04 |
| H2SO4 (lb/MMBtu) before scrubber | 5.7E-05 | 5.7E-05 | 5.7E-05 | 1.9E-03 | 3.6E-03 | 0.007 | 0.012 | 0.043 | 0.043 | 0.043 | 0.043 | 0.043 | 0.043 | 0.043 | 0.043 | 0.043 |
| H2SO4 (lb/MMBtu) after scrubber | 5.7E-05 | 5.7E-05 | 5.7E-05 | 1.9E-03 | 3.6E-03 | 0.007 | 0.012 | 0.043 | 0.043 | 0.043 | 0.043 | 0.043 | 0.043 | 3.4E-03 | 3.4E-03 | 3.4E-03 |
| Ammonia (ppm) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| CO Emissions (lb/hr) | 534 | 802 | 962 | 1,116 | 1,164 | 1,153 | 1,343 | 763 | 763 | 763 | 763 | 763 | 763 | 2,363 | 2,816 | 3,118 |
| NOx Emissions (lb/hr) | 534 | 802 | 962 | 1,116 | 1,164 | 1,153 | 1,343 | 763 | 763 | 763 | 763 | 763 | 763 | 2,363 | 2,816 | 3,118 |
| SO2 Emissions (lb/hr) | 1.78 | 2.67 | 3.21 | 1.22 | 2.41 | 4.78 | 9.53 | 1,900 | 1,900 | 1,900 | 1,900 | 1,900 | 1,900 | 5,550 | 6,611 | 7,311 |
| PM Total Emissions (lb/hr) | 32 | 48 | 58 | 67 | 70 | 69 | 81 | 46 | 46 | 46 | 46 | 46 | 46 | 137 | 165 | 183 |
| PM10 Total Emissions (lb/hr) | 30 | 45 | 53 | 62 | 65 | 64 | 75 | 42 | 42 | 42 | 42 | 42 | 42 | 127 | 153 | 170 |
| PM Filterable Emissions (lb/hr) | 18 | 27 | 32 | 37 | 38 | 38 | 45 | 25 | 25 | 25 | 25 | 25 | 25 | 76 | 92 | 102 |
| PM10 Filterable Emissions (lb/hr) | 14 | 21 | 26 | 30 | 31 | 31 | 36 | 20 | 20 | 20 | 20 | 20 | 20 | 61 | 73 | 81 |
| VOC Emissions (lb/hr) | 11.87 | 17.81 | 21.37 | 24.81 | 25.87 | 26 | 30 | 17 | 17 | 17 | 17 | 17 | 17 | 18 | 22 | 24 |
| lead (lb/hr) | 0 | 0 | 0 | 0.001 | 0.0025 | 0.010 | 0.010 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.061 | 0.073 | 0.081 |
| HF (lb/hr) | 0 | 0 | 0 | 1.38 | 2.76 | 5.51 | 11 | 22 | 22 | 22 | 22 | 22 | 22 | 3.41 | 4.09 | 4.55 |
| H2SO4 (lb/hr) | 0.068 | 0.102 | 0.123 | 4.68 | 9.23 | 18 | 36 | 73 | 73 | 73 | 73 | 73 | 73 | 21 | 23 | 23 |
| ammonia (lb/hr) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 14 | 14 | 16 |

Allow for three hours for start-up and stabilization of the dry FGD system, SCR, activated carbon, and ammonia feed systems.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification
User Identification: S46 - Midland
City: Midland
State: Michigan
Company: Mid-Michigan Energy, LLC
Type of Tank: Horizontal Tank
Description: 2,000 Gallon Diesel Fuel Storage Tank

Tank Dimensions
Shell Length (ft): 10.00
Diameter (ft): 12.00
Volume (gallons): 2,000.00
Turnovers: 25.00
Net Throughput(gal/yr): 50,000.00
Is Tank Heated (y/n): N
Is Tank Underground (y/n): N

Paint Characteristics
Shell Color/Shade: White/White
Shell Condition: Good

Breather Vent Settings
Vacuum Settings (psig): -0.03
Pressure Settings (psig): 0.03

Meteorological Data used in Emissions Calculations: Flint, Michigan (Avg Atmospheric Pressure = 14.33 psia)

TANKS 4.0.9d

Emissions Report - Detail Format

Liquid Contents of Storage Tank

S46 - Midland - Horizontal Tank
Midland, Michigan

| Mixture/Component | Month | Daily Liquid Surf. Temperature (deg F) | | | Liquid Bulk Temp (deg F) | Vapor Pressure (psia) | | | Vapor Mol. Weight | Liquid Mass Fract. | Vapor Mass Fract. | Mol. Weight | Basis for Vapor Pressure Calculations |
|---------------------------|-------|--|-------|-------|--------------------------|-----------------------|--------|--------|-------------------|--------------------|-------------------|-------------------------------------|---------------------------------------|
| | | Avg. | Min. | Max. | | Avg. | Min. | Max. | | | | | |
| Distillate fuel oil no. 2 | Jan | 36.48 | 33.27 | 39.70 | 47.07 | 0.0031 | 0.0031 | 0.0031 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 | |
| Distillate fuel oil no. 2 | Feb | 37.72 | 33.97 | 41.48 | 47.07 | 0.0031 | 0.0031 | 0.0033 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 | |
| Distillate fuel oil no. 2 | Mar | 42.76 | 38.46 | 47.07 | 47.07 | 0.0035 | 0.0031 | 0.0041 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 VP50 = .0045 | |
| Distillate fuel oil no. 2 | Apr | 48.52 | 43.22 | 53.83 | 47.07 | 0.0043 | 0.0036 | 0.0053 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 VP50 = .0045 | |
| Distillate fuel oil no. 2 | May | 53.76 | 47.63 | 59.87 | 47.07 | 0.0052 | 0.0042 | 0.0065 | 130.0000 | | 188.00 | Option 1: VP50 = .0045 VP60 = .0065 | |
| Distillate fuel oil no. 2 | Jun | 57.90 | 51.61 | 64.19 | 47.07 | 0.0061 | 0.0048 | 0.0075 | 130.0000 | | 188.00 | Option 1: VP50 = .0045 VP60 = .0065 | |
| Distillate fuel oil no. 2 | Jul | 59.99 | 53.79 | 66.18 | 47.07 | 0.0065 | 0.0053 | 0.0080 | 130.0000 | | 188.00 | Option 1: VP50 = .0045 VP60 = .0065 | |
| Distillate fuel oil no. 2 | Aug | 58.74 | 52.94 | 64.55 | 47.07 | 0.0062 | 0.0051 | 0.0076 | 130.0000 | | 188.00 | Option 1: VP50 = .0045 VP60 = .0065 | |
| Distillate fuel oil no. 2 | Sep | 55.06 | 49.86 | 60.26 | 47.07 | 0.0055 | 0.0045 | 0.0066 | 130.0000 | | 188.00 | Option 1: VP50 = .0045 VP60 = .0065 | |
| Distillate fuel oil no. 2 | Oct | 49.55 | 45.08 | 54.03 | 47.07 | 0.0044 | 0.0038 | 0.0053 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 VP50 = .0045 | |
| Distillate fuel oil no. 2 | Nov | 44.37 | 41.14 | 47.60 | 47.07 | 0.0037 | 0.0033 | 0.0042 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 VP50 = .0045 | |
| Distillate fuel oil no. 2 | Dec | 38.87 | 36.01 | 41.73 | 47.07 | 0.0031 | 0.0031 | 0.0033 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 | |

Vapor Pressure at Daily Average Liquid

| | | | | | | | | | | | | |
|------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Surface Temperature (psia): | 0.0031 | 0.0031 | 0.0035 | 0.0043 | 0.0052 | 0.0061 | 0.0065 | 0.0062 | 0.0055 | 0.0044 | 0.0037 | 0.0031 |
| Net Throughput (gal/mo.): | 4,166.6667 | 4,166.6667 | 4,166.6667 | 4,166.6667 | 4,166.6667 | 4,166.6667 | 4,166.6667 | 4,166.6667 | 4,166.6667 | 4,166.6667 | 4,166.6667 | 4,166.6667 |
| Annual Turnovers: | 25.0000 | 25.0000 | 25.0000 | 25.0000 | 25.0000 | 25.0000 | 25.0000 | 25.0000 | 25.0000 | 25.0000 | 25.0000 | 25.0000 |
| Turnover Factor: | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Tank Diameter (ft): | 12.0000 | 12.0000 | 12.0000 | 12.0000 | 12.0000 | 12.0000 | 12.0000 | 12.0000 | 12.0000 | 12.0000 | 12.0000 | 12.0000 |
| Working Loss Product Factor: | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total Losses (lb): | 0.0767 | 0.0796 | 0.1015 | 0.1386 | 0.1882 | 0.2154 | 0.2312 | 0.2132 | 0.1729 | 0.1304 | 0.0892 | 0.0715 |

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

S46 - Midland - Horizontal Tank
Midland, Michigan

| Components | Losses(lbs) | | Total Emissions |
|---------------------------|--------------|----------------|-----------------|
| | Working Loss | Breathing Loss | |
| Distillate fuel oil no. 2 | 0.71 | 1.00 | 1.71 |

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification

User Identification: S47 - Midland
City: Midland
State: Michigan
Company: Mid-Michigan Energy, LLC
Type of Tank: Horizontal Tank
Description: 500 Gallon Diesel Fuel Storage Tank

Tank Dimensions

Shell Length (ft): 9.00
Diameter (ft): 6.00
Volume (gallons): 500.00
Turnovers: 5.00
Net Throughput(gal/yr): 2,500.00
Is Tank Heated (y/n): N
Is Tank Underground (y/n): N

Paint Characteristics

Shell Color/Shade: White/White
Shell Condition: Good

Breather Vent Settings

Vacuum Settings (psig): -0.03
Pressure Settings (psig): 0.03

Meteorological Data used in Emissions Calculations: Flint, Michigan (Avg Atmospheric Pressure = 14.33 psia)

TANKS 4.0.9d

Emissions Report - Detail Format

Liquid Contents of Storage Tank

S47 - Midland - Horizontal Tank
Midland, Michigan

| Mixture/Component | Month | Daily Liquid Surf. Temperature (deg F) | | | Liquid Bulk Temp (deg F) | Vapor Pressure (psia) | | | Vapor Mol. Weight | Liquid Mass Fract. | Vapor Mass Fract. | Mol. Weight | Basis for Vapor Pressure Calculations |
|---------------------------|-------|--|-------|-------|--------------------------|-----------------------|--------|--------|-------------------|--------------------|-------------------|-------------------------------------|---------------------------------------|
| | | Avg. | Min. | Max. | | Avg. | Min. | Max. | | | | | |
| Distillate fuel oil no. 2 | Jan | 36.48 | 33.27 | 39.70 | 47.07 | 0.0031 | 0.0031 | 0.0031 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 | |
| Distillate fuel oil no. 2 | Feb | 37.72 | 33.97 | 41.48 | 47.07 | 0.0031 | 0.0031 | 0.0033 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 | |
| Distillate fuel oil no. 2 | Mar | 42.76 | 38.46 | 47.07 | 47.07 | 0.0035 | 0.0031 | 0.0041 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 VP50 = .0045 | |
| Distillate fuel oil no. 2 | Apr | 48.52 | 43.22 | 53.83 | 47.07 | 0.0043 | 0.0036 | 0.0053 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 VP50 = .0045 | |
| Distillate fuel oil no. 2 | May | 53.75 | 47.63 | 59.87 | 47.07 | 0.0052 | 0.0042 | 0.0065 | 130.0000 | | 188.00 | Option 1: VP50 = .0045 VP60 = .0065 | |
| Distillate fuel oil no. 2 | Jun | 57.90 | 51.61 | 64.19 | 47.07 | 0.0061 | 0.0048 | 0.0075 | 130.0000 | | 188.00 | Option 1: VP50 = .0045 VP60 = .0065 | |
| Distillate fuel oil no. 2 | Jul | 59.99 | 53.79 | 66.18 | 47.07 | 0.0065 | 0.0053 | 0.0080 | 130.0000 | | 188.00 | Option 1: VP50 = .0045 VP60 = .0065 | |
| Distillate fuel oil no. 2 | Aug | 58.74 | 52.94 | 64.55 | 47.07 | 0.0062 | 0.0051 | 0.0076 | 130.0000 | | 188.00 | Option 1: VP50 = .0045 VP60 = .0065 | |
| Distillate fuel oil no. 2 | Sep | 55.06 | 49.86 | 60.26 | 47.07 | 0.0055 | 0.0045 | 0.0066 | 130.0000 | | 188.00 | Option 1: VP50 = .0045 VP60 = .0065 | |
| Distillate fuel oil no. 2 | Oct | 49.55 | 45.08 | 54.03 | 47.07 | 0.0044 | 0.0038 | 0.0053 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 VP50 = .0045 | |
| Distillate fuel oil no. 2 | Nov | 44.37 | 41.14 | 47.60 | 47.07 | 0.0037 | 0.0033 | 0.0042 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 VP50 = .0045 | |
| Distillate fuel oil no. 2 | Dec | 38.87 | 36.01 | 41.73 | 47.07 | 0.0031 | 0.0031 | 0.0033 | 130.0000 | | 188.00 | Option 1: VP40 = .0031 | |

Vapor Pressure at Daily Average Liquid

| | | | | | | | | | | | |
|------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Surface Temperature (psia): | 0.0031 | 0.0035 | 0.0043 | 0.0052 | 0.0061 | 0.0065 | 0.0062 | 0.0055 | 0.0044 | 0.0037 | 0.0031 |
| Net Throughput (gal/mo.): | 208.3333 | 208.3333 | 208.3333 | 208.3333 | 208.3333 | 208.3333 | 208.3333 | 208.3333 | 208.3333 | 208.3333 | 208.3333 |
| Annual Turnovers: | 5.0000 | 5.0000 | 5.0000 | 5.0000 | 5.0000 | 5.0000 | 5.0000 | 5.0000 | 5.0000 | 5.0000 | 5.0000 |
| Turnover Factor: | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Tank Diameter (ft): | 6.0000 | 6.0000 | 6.0000 | 6.0000 | 6.0000 | 6.0000 | 6.0000 | 6.0000 | 6.0000 | 6.0000 | 6.0000 |
| Working Loss Product Factor: | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total Losses (lb): | 0.0103 | 0.0150 | 0.0215 | 0.0305 | 0.0348 | 0.0374 | 0.0339 | 0.0265 | 0.0193 | 0.0117 | 0.0091 |

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

S47 - Midland - Horizontal Tank
Midland, Michigan

| Components | Losses(lbs) | | Total Emissions |
|---------------------------|--------------|----------------|-----------------|
| | Working Loss | Breathing Loss | |
| Distillate fuel oil no. 2 | 0.04 | 0.23 | 0.26 |

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Identification and Physical Characteristics

Identification
 User Identification: S48 - Midland
 City: Midland
 State: Michigan
 Company: Mid-Michigan Energy, LLC
 Type of Tank: Horizontal Tank
 Description: 150 Gallon Unleaded Gasoline Storage Tank

Tank Dimensions
 Shell Length (ft): 6.00
 Diameter (ft): 3.00
 Volume (gallons): 150.00
 Turnovers: 21.00
 Net Throughput(gall/yr): 3,150.00
 Is Tank Heated (y/n): N
 Is Tank Underground (y/n): N

Paint Characteristics
 Shell Color/Shade: White/White
 Shell Condition: Good

Breather Vent Settings
 Vacuum Settings (psig): -0.03
 Pressure Settings (psig): 0.03

Meteorological Data used in Emissions Calculations: Flint, Michigan (Avg Atmospheric Pressure = 14.33 psia)

TANKS 4.0.9d

Emissions Report - Detail Format

Liquid Contents of Storage Tank

S48 - Midland - Horizontal Tank
Midland, Michigan

| Mixture/Component | Month | Daily Liquid Surf. Temperature (deg F) | | | Liquid Bulk Temp (deg F) | Vapor Pressure (psia) | | | Vapor Mol. Weight | Liquid Mass Fract. | Vapor Mass Fract. | Mol. Weight | Basis for Vapor Pressure Calculations |
|-------------------|-------|--|-------|-------|--------------------------|-----------------------|--------|--------|-------------------|--------------------|-------------------|--------------------------------|---------------------------------------|
| | | Avg. | Min. | Max. | | Avg. | Min. | Max. | | | | | |
| Gasoline (RVP 10) | Jan | 36.48 | 33.27 | 39.70 | 47.07 | 3.2163 | 3.0021 | 3.4427 | 66.0000 | | 92.00 | Option 4: RVP=10, ASTM Slope=3 | |
| Gasoline (RVP 10) | Feb | 37.72 | 33.97 | 41.48 | 47.07 | 3.3021 | 3.0480 | 3.5730 | 66.0000 | | 92.00 | Option 4: RVP=10, ASTM Slope=3 | |
| Gasoline (RVP 10) | Mar | 42.76 | 38.46 | 47.07 | 47.07 | 3.6689 | 3.3537 | 4.0097 | 66.0000 | | 92.00 | Option 4: RVP=10, ASTM Slope=3 | |
| Gasoline (RVP 10) | Apr | 48.62 | 43.22 | 53.83 | 47.07 | 4.1300 | 3.7046 | 4.5939 | 66.0000 | | 92.00 | Option 4: RVP=10, ASTM Slope=3 | |
| Gasoline (RVP 10) | May | 53.75 | 47.63 | 59.87 | 47.07 | 4.5868 | 4.0559 | 5.1723 | 66.0000 | | 92.00 | Option 4: RVP=10, ASTM Slope=3 | |
| Gasoline (RVP 10) | Jun | 57.90 | 51.61 | 64.19 | 47.07 | 4.9781 | 4.3953 | 5.8213 | 66.0000 | | 92.00 | Option 4: RVP=10, ASTM Slope=3 | |
| Gasoline (RVP 10) | Jul | 59.69 | 53.79 | 66.18 | 47.07 | 5.1843 | 4.5908 | 5.8377 | 66.0000 | | 92.00 | Option 4: RVP=10, ASTM Slope=3 | |
| Gasoline (RVP 10) | Aug | 58.74 | 52.94 | 64.55 | 47.07 | 5.0606 | 4.5137 | 5.6594 | 66.0000 | | 92.00 | Option 4: RVP=10, ASTM Slope=3 | |
| Gasoline (RVP 10) | Sep | 55.08 | 49.66 | 60.26 | 47.07 | 4.7077 | 4.2431 | 5.2122 | 66.0000 | | 92.00 | Option 4: RVP=10, ASTM Slope=3 | |
| Gasoline (RVP 10) | Oct | 49.65 | 45.08 | 54.03 | 47.07 | 4.2173 | 3.8466 | 4.6126 | 66.0000 | | 92.00 | Option 4: RVP=10, ASTM Slope=3 | |
| Gasoline (RVP 10) | Nov | 44.37 | 41.14 | 47.60 | 47.07 | 3.7936 | 3.5482 | 4.0530 | 66.0000 | | 92.00 | Option 4: RVP=10, ASTM Slope=3 | |
| Gasoline (RVP 10) | Dec | 38.87 | 36.01 | 41.73 | 47.07 | 3.3831 | 3.1843 | 3.5919 | 66.0000 | | 92.00 | Option 4: RVP=10, ASTM Slope=3 | |

Vapor Pressure at Daily Average Liquid

| | | | | | | | | | | | | |
|------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Surface Temperature (psia): | 3.2163 | 3.3021 | 3.6699 | 4.1300 | 4.5868 | 4.9781 | 5.1843 | 5.0606 | 4.7077 | 4.2173 | 3.7938 | 3.3831 |
| Net Throughput (gal/mo.): | 262.5000 | 262.5000 | 262.5000 | 262.5000 | 262.5000 | 262.5000 | 262.5000 | 262.5000 | 262.5000 | 262.5000 | 262.5000 | 262.5000 |
| Annual Turnovers: | 21.0000 | 21.0000 | 21.0000 | 21.0000 | 21.0000 | 21.0000 | 21.0000 | 21.0000 | 21.0000 | 21.0000 | 21.0000 | 21.0000 |
| Turnover Factor: | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Tank Diameter (ft): | 3.0000 | 3.0000 | 3.0000 | 3.0000 | 3.0000 | 3.0000 | 3.0000 | 3.0000 | 3.0000 | 3.0000 | 3.0000 | 3.0000 |
| Working Loss Product Factor: | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 | 1.0000 |
| Total Losses (lb): | 2.9273 | 3.1323 | 4.1408 | 5.4571 | 7.1571 | 8.0078 | 8.5979 | 7.8939 | 6.4181 | 5.0844 | 3.5204 | 2.9024 |

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: January, February, March, April, May, June, July, August, September, October, November, December

S48 - Midland - Horizontal Tank
Midland, Michigan

| Components | Losses(lbs) | | Total Emissions |
|-------------------|--------------|----------------|-----------------|
| | Working Loss | Breathing Loss | |
| Gasoline (RVP 10) | 20.72 | 44.52 | 65.24 |

Emergency Diesel Engine Driven Generator - Hazardous Air Pollutants

Design Data

| | |
|---------------------------|---------------|
| Generator size | 1500 KW |
| Heat Rate | 16.5 MMBtu/Hr |
| Number of Generators | 1.0 |
| Annual Hours of Operation | 500 hr/yr |
| Fuel Flow: | 119 gal/hr |
| Annual Fuel: | 59,500 gal |

| Pollutant | Emission Factor | Units | Notes | Emission Rates | |
|------------------------|-----------------|----------|-------|----------------|-----------|
| | | | | lb/hr | tons/year |
| Benzene | 7.76E-04 | lb/MMBtu | A | 1.3E-02 | 3.2E-03 |
| Toluene | 2.81E-04 | lb/MMBtu | A | 4.6E-03 | 1.2E-03 |
| Xylenes | 1.93E-04 | lb/MMBtu | A | 3.2E-03 | 8.0E-04 |
| Propylene | 2.79E-03 | lb/MMBtu | A | 4.6E-02 | 1.2E-02 |
| Formaldehyde | 7.89E-05 | lb/MMBtu | A | 1.3E-03 | 3.3E-04 |
| Acetaldehyde | 2.52E-05 | lb/MMBtu | A | 4.2E-04 | 1.0E-04 |
| Acrolein | 7.88E-06 | lb/MMBtu | A | 1.3E-04 | 3.3E-05 |
| Naphthalene | 1.30E-04 | lb/MMBtu | B | 2.1E-03 | 5.4E-04 |
| Acenaphthylene | 9.23E-06 | lb/MMBtu | B | 1.5E-04 | 3.8E-05 |
| Acenaphthene | 4.68E-06 | lb/MMBtu | B | 7.7E-05 | 1.9E-05 |
| Fluorene | 1.28E-05 | lb/MMBtu | B | 2.1E-04 | 5.3E-05 |
| Phenanthrene | 4.08E-05 | lb/MMBtu | B | 6.7E-04 | 1.7E-04 |
| Anthracene | 1.23E-06 | lb/MMBtu | B | 2.0E-05 | 5.1E-06 |
| Fluoranthene | 4.03E-06 | lb/MMBtu | B | 6.6E-05 | 1.7E-05 |
| Pyrene | 3.71E-06 | lb/MMBtu | B | 6.1E-05 | 1.5E-05 |
| Benz(a)anthracene | 6.22E-07 | lb/MMBtu | B | 1.0E-05 | 2.6E-06 |
| Chrysene | 1.53E-06 | lb/MMBtu | B | 2.5E-05 | 6.3E-06 |
| Benzo(b)fluoranthene | 1.11E-06 | lb/MMBtu | B | 1.8E-05 | 4.6E-06 |
| Benzo(k)fluoranthene | 2.18E-07 | lb/MMBtu | B | 3.6E-06 | 9.0E-07 |
| Benzo(a)pyrene | 2.57E-07 | lb/MMBtu | B | 4.2E-06 | 1.1E-06 |
| Indeno(1,2,3-cd)pyrene | 4.14E-07 | lb/MMBtu | B | 6.8E-06 | 1.7E-06 |
| Dibenz(a,h)anthracene | 3.46E-07 | lb/MMBtu | B | 5.7E-06 | 1.4E-06 |
| Benzo(g,h,i)perylene | 5.56E-07 | lb/MMBtu | B | 9.2E-06 | 2.3E-06 |
| Total PAH | 2.12E-04 | lb/MMBtu | B | 3.5E-03 | 8.7E-04 |

Notes:

A = Emission Factor Source: AP-42, Table 3.4-3, 5th edition (October 1996)

B = Emission Factor Source: AP-42, Table 3.4-4, 5th edition (October 1996)

Emergency Diesel Engine Driven Firewater Pump - Hazardous Air Pollutants

Design Data

Firewater pump size: 450 hp
 Heat Rate: 3.15 MMBtu/hr
 Annual Hours of Operation: 150 hours
 Fuel Flow: 23 gal/hr
 Annual Fuel: 3,404 gal

| Pollutant | Emission Factor | Units | Notes | Emission Rates | |
|------------------------|-----------------|----------|-------|----------------|-----------|
| | | | | lb/hr | tons/year |
| Benzene | 9.33E-04 | lb/MMBtu | A | 2.9E-03 | 2.2E-04 |
| Toluene | 4.09E-04 | lb/MMBtu | A | 1.3E-03 | 9.7E-05 |
| Xylenes | 2.85E-04 | lb/MMBtu | A | 9.0E-04 | 6.7E-05 |
| Propylene | 2.58E-03 | lb/MMBtu | A | 8.1E-03 | 6.1E-04 |
| 1,3-Butadiene | 3.91E-05 | lb/MMBtu | A | 1.2E-04 | 9.2E-06 |
| Formaldehyde | 1.18E-03 | lb/MMBtu | A | 3.7E-03 | 2.8E-04 |
| Acetaldehyde | 7.67E-04 | lb/MMBtu | A | 2.4E-03 | 1.8E-04 |
| Acrolein | 9.25E-05 | lb/MMBtu | A | 2.9E-04 | 2.2E-05 |
| Naphthalene | 8.48E-05 | lb/MMBtu | A | 2.7E-04 | 2.0E-05 |
| Acenaphthylene | 5.06E-06 | lb/MMBtu | A | 1.6E-05 | 1.2E-06 |
| Acenaphthene | 1.42E-06 | lb/MMBtu | A | 4.5E-06 | 3.4E-07 |
| Fluorene | 2.92E-05 | lb/MMBtu | A | 9.2E-05 | 6.9E-06 |
| Phenanthrene | 2.94E-05 | lb/MMBtu | A | 9.3E-05 | 6.9E-06 |
| Anthracene | 1.87E-06 | lb/MMBtu | A | 5.9E-06 | 4.4E-07 |
| Fluoranthene | 7.61E-06 | lb/MMBtu | A | 2.4E-05 | 1.8E-06 |
| Pyrene | 4.78E-06 | lb/MMBtu | A | 1.5E-05 | 1.1E-06 |
| Benz(a)anthracene | 1.68E-06 | lb/MMBtu | A | 5.3E-06 | 4.0E-07 |
| Chrysene | 3.53E-07 | lb/MMBtu | A | 1.1E-06 | 8.3E-08 |
| Benzo(b)fluoranthene | 9.91E-08 | lb/MMBtu | A | 3.1E-07 | 2.3E-08 |
| Benzo(k)fluoranthene | 1.55E-07 | lb/MMBtu | A | 4.9E-07 | 3.7E-08 |
| Benzo(a)pyrene | 1.88E-07 | lb/MMBtu | A | 5.9E-07 | 4.4E-08 |
| Indeno(1,2,3-cd)pyrene | 3.75E-07 | lb/MMBtu | A | 1.2E-06 | 8.9E-08 |
| Dibenz(a,h)anthracene | 5.83E-07 | lb/MMBtu | A | 1.8E-06 | 1.4E-07 |
| Benzo(g,h,l)perylene | 4.89E-07 | lb/MMBtu | A | 1.5E-06 | 1.2E-07 |
| Total PAH | 1.68E-04 | lb/MMBtu | A | 5.3E-04 | 4.0E-05 |

Notes:

A = Emission Factor Source: AP-42, Table 3.3-2, 5th edition (October 1996)