**Control Devices:** In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

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## Uncontrolled Particulate Emission Rates

Estimates for Uncontrolled Material Handling ($PM_{2.5}$, $PM_{10}$ and PM)

Typical composition of one cubic yard of concrete produced at the Alto Concrete Batch Plant (CBP) will be:

**Concrete Design Mix for One Cubic Yard**

| Materials | Weight Per Cubic Yard (in lbs) | Weights Per 125 Cubic Yards (in ton) |
|---|---|---|
| Cement | 489 | 30.6 |
| Fly Ash | 132 | 8.3 |
| Water | 260 | 16.3 |
| Coarse Aggregate(gravel) | 1900 | 118.8 |
| Fine Aggregate (sand) | 1100 | 68.8 |
| Total | 3881 | 242.6 |

Hourly raw material throughputs used in material handling emission equations are based on the tons per hour throughput.

Aggregate/Sand = 187.5 tons/hour
Cement = 30.6 tons/hour
Fly Ash = 8.3 tons/hour

To estimate material handling uncontrolled particulate emission rates for aggregate handling operations (loading storage piles, loading feeder, loading the 4-bin aggregate feeder), an emission equation was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (1/1995), where the k is a constant (PM = 0.74, PM10 = 0.35, PM2.5 = 0.053). Input wind speed for maximum hourly emission rates is the NMED Default of 11 mph and input windspeed for the annual emission rates is the Ruidoso 1996 – 2006 wind speed of 8.3 mph. The moisture content for the aggregate of 1.77% and sand of 4.17% (AP-42 Section 11.12, Table 11.12-2, Footnote b). The weighted average moisture content for sand and aggregate is 2.65% ((1.77 * 118.8 + 4.17 * 68.8)/187.5). To estimate pre-control particulate emissions rates for aggregate handling transfer points (unloading of the feeder, loading and unloading the aggregate bin/weigh batcher), emission factors were obtained from AP-42 Section 11.19.2, Table 11.19.2-2, "Uncontrolled Conveyor Transfer Point". Uncontrolled PM2.5 emission rate is based on the PM2.5/PM10 k factor of 0.053/0.35 found in AP-42 Section 13.2.4 and PM10 emission factor of 0.00110 lbs/ton.

# Estimates for Controlled Material Handling Air Pollutants ($PM_{2.5}$, $PM_{10}$, and PM) (PTE)

No controls will be included for Units 1, 2, or 11 with the exception on limiting annual throughput. Fugitive dust emissions from material handling sources (Units 3, 4, 5, 6) will be controlled by adding water sprays at the exit of the aggregate/sand feed hopper (EPA AP-42 control efficiency of 95.82%).

To estimate material handling control particulate emission rates for aggregate handling operations (loading storage piles, and loading feed hopper), an emission equation was obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 13.2.4 (1/1995), where the k is a constant (PM = 0.74, PM10 = 0.35, PM2.5 = 0.053). Input wind speed for maximum hourly emission rates is the NMED Default of 11 mph and input windspeed for the annual emission rates is the Ruidoso 1996 – 2006 wind speed of 8.3 mph. The moisture content for the aggregate of 1.77% and sand of 4.17% (AP-42 Section 11.12, Table 11.12-2, Footnote b). The weighted average moisture content for sand and aggregate is 2.65% ((1.77 * 118.8 + 4.17 * 68.8)/187.5). To estimate particulate emissions rates for aggregate handling transfer points (unloading of the feeder, loading and unloading the aggregate bin/weigh batcher), emission factors were obtained from AP-42 Section 11.19.2, Table 11.19.2-2, "Conveyor Transfer Point Controlled". Additional reductions for annual emissions are found in limiting annual production.

To estimate control particulate emission rates for silo loading, cement/fly ash batcher loading operations, and concrete mixer truck loading, emission equations were obtained from EPA's Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Fifth Edition, Section 11.12 (06/06), Table 11.12-2 and multiplied by the percent control efficiency of the dust collector baghouse. The dust collector baghouses will control dust to a 99.9 percent efficiency. $PM_{2.5}$ emission rate for concrete mixer truck loading emissions were determined using the ratio of controlled truck loading ratio Table 11.12-3 PM10 lb/hr * PM2.5/PM10 (0.048/0.32). $PM_{2.5}$ emission rate for cement/fly ash batcher loading emissions were determined using the ratio of controlled mixer loading ratio Table 11.12-4 PM10 lbs/hr * PM2.5/PM10 (0.03/0.13). $PM_{2.5}$ emission rate for cement silo emissions loading were determined using the ratio of controlled mixer loading ratio Table 11.12-4 PM10 lbs/hr * PM2.5/PM10 (0.03/0.13). $PM_{2.5}$ emission rate for fly ash silo emissions loading were determined using the ratio of controlled mixer loading ratio Table 11.12-4 PM10 lbs/hr * PM2.5/PM10 (0.03/0.13).

Maximum rated material throughput is 125 cubic yards per hour. Annual emissions in tons per year (tpy) were calculated assuming operation of 500,000 cubic yards per year.

**Aggregate Handling Emission Equation – Hourly Emissions**

$E$ (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$

$E_{PM}$ (lbs/ton) = 0.74 x 0.0032 x $(11/5)^{1.3}$ / $(1.77/2)^{1.4}$

$E_{PM10}$ (lbs/ton) = 0.35 x 0.0032 x $(11/5)^{1.3}$ / $(1.77/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(11/5)^{1.3}$ / $(1.77/2)^{1.4}$

$E_{PM}$ = 0.00783 lbs/ton; $E_{PM10}$ = 0.00370 lbs/ton; $E_{PM2.5}$ = 0.00056 lbs/ton

**Sand Handling Emission Equation – Hourly Emissions**

$E$ (lbs/ton) = k x 0.0032 x $(U/5)^{1.3}$ / $(M/2)^{1.4}$

$E_{PM}$ (lbs/ton) = 0.74 x 0.0032 x $(11/5)^{1.3}$ / $(4.17/2)^{1.4}$

$E_{PM10}$ (lbs/ton) = 0.35 x 0.0032 x $(11/5)^{1.3}$ / $(4.17/2)^{1.4}$

$E_{PM2.5}$ (lbs/ton) = 0.053 x 0.0032 x $(11/5)^{1.3}$ / $(4.17/2)^{1.4}$

$E_{PM}$ = 0.00236 lbs/ton; $E_{PM10}$ = 0.00112 lbs/ton; $E_{PM2.5}$ = 0.00017 lbs/ton

**Aggregate/Sand Handling Emission Equation – Hourly Emissions**