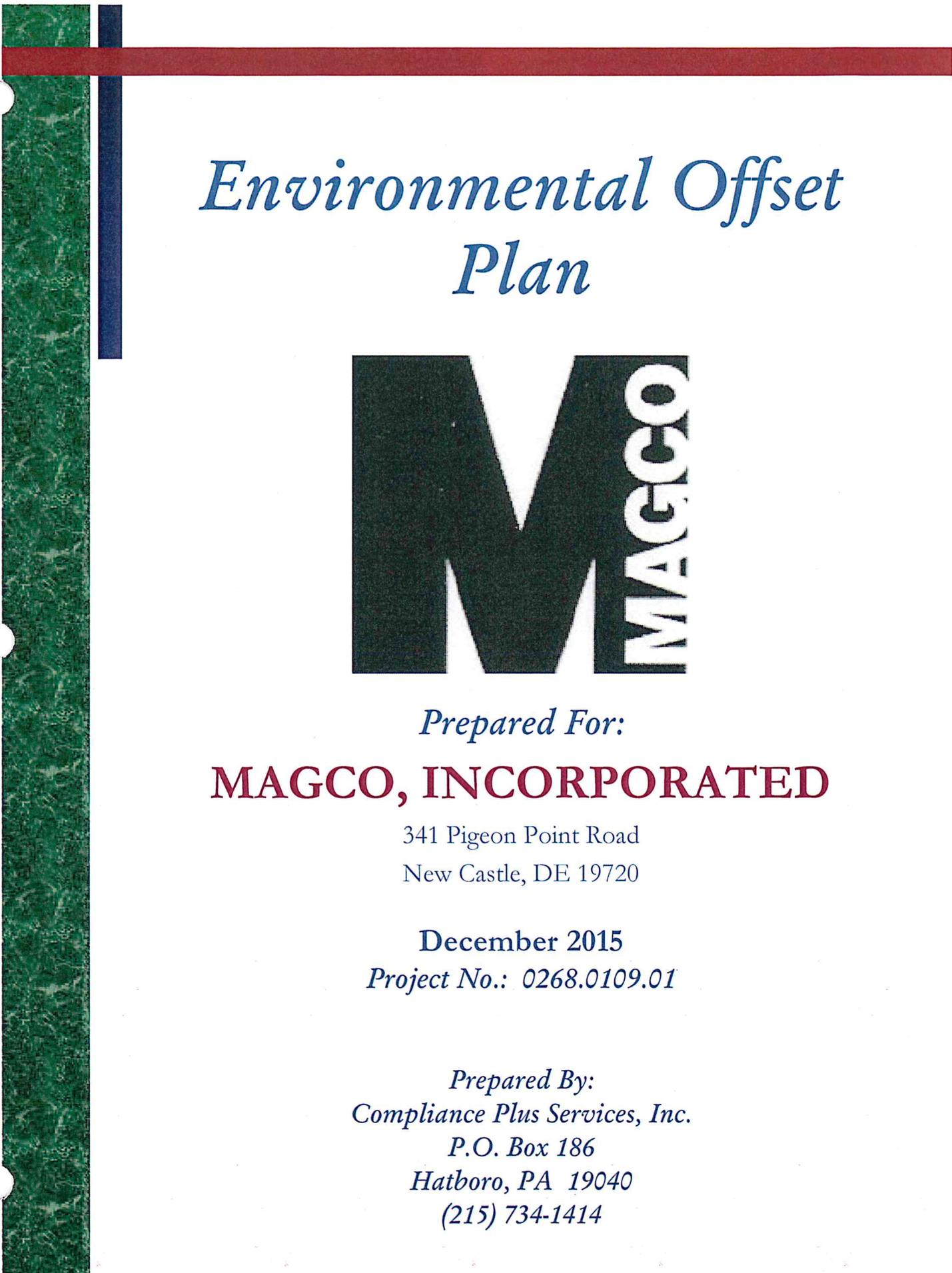


**Appendix 8**

*Environmental Offset Plan*



# *Environmental Offset Plan*



*Prepared For:*

**MAGCO, INCORPORATED**

341 Pigeon Point Road  
New Castle, DE 19720

**December 2015**

*Project No.: 0268.0109.01*

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## **EXHIBITS:**

- Exhibit A** - Detailed Emissions Calculations
- Exhibit B** - Coastal Zone Environmental Impact Offset Matrix
- Exhibit C** - Chemical Hazard Profiles
- Nitrogen Dioxide
  - Particulate Matter

**ENVIRONMENTAL OFFSET PLAN  
FOR  
MAGCO INCORPORATED  
PROPOSED ANNUAL THROUGHPUT CAPACITY INCREASE  
FOR AN EXISTING SEA SALT PACKAGING FACILITY**

**Executive Summary**

This proposed Environmental Offset Plan has been prepared by Compliance Plus Services, Inc. (“CPS”) in support of the Magco Incorporated (“Magco”) Coastal Zone Act Permit Application for an increase in the annual operating throughput capacity of its existing sea salt packing operation currently located at 341 Pigeon Point Road, New Castle, DE.

The current Magco facility receives, processes (by drying) and packages sea salt, derived from mining of former ocean beds to produce various ice melt and water treatment salt products for commercial markets. The facility was originally permitted under the Coastal Zone Program to process up to 200,000 tons of sea salt annually. Since the products that Magco produces are primarily driven by seasonal demand, the plant is only in full operation five to six months of the year. However, based on the success of this Delaware division, Magco is seeking to increase its annual throughput capacity from 200,000 tons/year to 300,000 tons/year. This will be accomplished solely based on an increase in the operating hours of its existing plant and will not require increased storage, new equipment or additional land use.

Under its initial Coastal Zone Application, Magco’s primary impacts to the Coastal Zone were air emissions related to the operation of a new fluidized bed natural gas dryer unit as well as particulate emissions associated with the handling, drying and packaging (bagging) of the sea salt material itself. However, as a result of this proposed production increase, the expected environmental impacts to the Coastal Zone are limited primarily to the increase in sea salt particulate emission from handling, drying and packaging operations. During the past six (6) years of operating its new plant, Magco has retained efficiencies in the dryer operation such that its annual emissions and fuel usage have been significantly below the overly conservative estimates originally used to permit the facility. Consequently, any additional operating hours required to address the proposed production increase will not result in a significant increase in the currently permitted natural gas combustion emissions from the dryer unit. Accordingly, the environmental impacts and estimated required offsets related to the air emissions from the planned production increase are detailed below. Estimated emissions are based on a combination of certified manufacturer’s data and US Environmental Protection Agency (EPA) AP-42 emission factors and are presented as Exhibit A as well as summarized in the table below.

Pollutant	Projected Annual Emissions (Based on 300,000 tons/yr)	Existing Permitted Emissions (Based on 200,000 tons/yr)	Overall Impact (Difference between projected emissions and the existing permitted emissions)	Estimated Required Offsets (Based on 1.3 multiplier)
	Units in Tons/year			
PM (Salt)	11.46	6.05	5.41	7.03
PM (Natural Gas)	0.13	0.07	0.06	0.08
<b>Total PM</b>	11.59	6.12	5.47	7.11
NOx	3.72	3.67	0.05	0.06
SOx	0.01	0.01	0.00	0.00
VOCs	0.20	0.30	-0.10	-0.10
			<b>Total Required Offsets</b>	7.07

Magco is proposing to obtain emission credits through the Delaware Economic Development Office (DEDO) to offset the impacts of the proposed change in operation. The offsets will be in the form of NO<sub>x</sub> credits to more than offset the proposed increase in emissions from the proposed annual production throughput increase. Magco believes the proposed offsets will be clearly and demonstrably more beneficial to the environmental in the Coastal Zone than any harm done by the potential adverse environmental impacts of these estimated particulate emissions primarily associated with sea salt.

## 1.0 INTRODUCTION

The following Environmental Offset Plan (“Plan”) was prepared by Compliance Plus Services, Inc. (“CPS”) in support of the Magco Incorporated (“Magco”) Coastal Zone Act Permit Application (“Application”) for a proposed annual throughput increase at the existing sea salt packaging operation. The current onsite operations at Magco consist of:

- 1) Transporting bulk salt to the site by truck for storage in stockpiles onsite;
- 2) Reducing the moisture content of the salt through a fluidized bed dryer;
- 3) Sorting the salt into distinct sizes suitable for various end market uses (e.g., ice melt, water softeners, etc.);
- 4) Packaging the salt into bags or other containers; and
- 5) Shipping the bags and/or containers offsite to commercial market suppliers.

A small portion of the dried sea salt produced may be blended with other materials for special product lines (e.g., pet friendly ice melt products). The only proposed change in operation under this application is an increase in the annual throughput capacity of Magco’s existing plant from 200,000 tons/year to 300,000 tons/year. This will be accomplished solely by increasing the number of hours of operation at the current facility. There will be no additional equipment, storage or new land use required to achieve this proposed production increase.

A detailed description of the drying and packaging operations conducted at the Magco plant is provided in the Application. This Plan describes the proposed environmental benefits offered by Magco in support of its Application to more than offset the potential adverse environmental impacts of the planned increase in production at Magco’s sea salt packaging facility.

## 2.0 FACILITY INFORMATION

### 2.1 Current Site Conditions

The facility is located at 341 Pigeon Point Road, New Castle, DE. The site consists of 7.56 acres, the majority of which is covered with bituminous pavement and is occupied by an 82,000 square foot warehouse. The site is located in an area zoned for heavy industrial uses. The proposed use falls within the land use guidelines of the local municipality. Access to the site will be controlled by existing fencing and gates; members of the public will not have access to the site.

The current operation consists of the existing enclosed warehouse building used to contain the salt drying operation, a screen to separate the dried salt into distinct particle size fractions and a packaging or bagging operation. Certain salts may also be shipped offsite in bulk via trucks depending on the end market use. The existing site has easy access to major transportation arteries, including I-495, I-95, I-295, as well as, the Port of Wilmington.

## 2.2 Proposed Site Improvements

There are no site improvements required to achieve the proposed annual production throughput increase. The planned production increase will be accomplished via extended operating hours utilizing existing process equipment. The increase in production will require extended operating man-hours for Magco's existing seasonal staff which will improve the wage earnings of most current employees.

## 3.0 OFFSET PLAN

The environmental impact to the Coastal Zone consists primarily (over 98.9%) of air emissions of sea salt particulates that are generated during the salt drying and packaging operations at the Magco facility. The particulates from sea salt are larger particulates that can naturally absorb into the human body through the lungs and is actually used routinely as a therapeutic treatment. The remaining portion of the expected particulate emissions (a little over 1%) resulting from the production increase is from fuel (natural gas) combustion. Estimated emissions using a combination of certified manufacturer's data and EPA AP-42 emission factors are presented as Exhibit A.

Delaware's Coastal Zone Permit regulations require that the proposed offset must be clearly and demonstrably more beneficial to the environment of the Coastal Zone than the potential negative impacts associated with any new pollution from the proposed operations, or in this case increase in operation. Informal policy is to "offset" emissions by at least 130 percent of projected annual emissions. While this general practice is sound, in this case the vast majority of predicted emissions have little or no negative impact on the environment. In fact, sea salt particles are emitted daily from the world's oceans through evaporation and are actually part of the Earth's transpiration process. Consequently, although the proposed offset does not purport mathematically with the current practice, it offers emission credits in an air contaminant that is substantially more adverse to the environment than the sea salt. Magco, therefore, believes that the actual qualitative benefit will be significantly greater than 130 percent and the acquisition of emission credits through DEDO will be sufficient to more than offset the air emissions from the actual Magco operations.

### 3.1 Offsetting Approach

The Coastal Zone Act permit application and the Environmental Offset Plan are based on estimating the emissions resulting from the proposed annual throughput increase to 300,000 tons/year and comparing them with the current facility permitted limits (which are based on a 200,000 tons/year production rate). The increase in throughput capacity of the Magco operation is estimated to produce a relatively small increase of: oxides of nitrogen (NO<sub>x</sub>) and particulate matter (PM). Emissions from the project principally involve salt particles resulting from the handling and bagging of the salt as well as a small increase in the products of combustion of the fuel used in the fluidized bed dryer to dry the sea salt. The estimate also shows a slight decrease

in the amount of volatile organic compounds (VOC's) emissions and no change in the sulfur dioxide (SOx) emissions when compared to the current permitted process emission limits.

The table in Section 3.2 lists the projected emissions from the operation based on the proposed throughput increase to 300,000 tons/yr and the current permitted emissions. The "Overall Impact" is the difference between the current permitted limit emissions and new estimated total of emissions associated with the new production rate. This difference is the amount which must be offset in accordance with the Coastal Zone Act regulations.

It should be noted that the current permit limits were previously offset at a 130% increase in the facilities original Coastal Zone Application and Environmental Offset Plan submitted to DNREC in May of 2009. The original offset plan included purchasing VOC and NOx emission credits from DEDO. The offsets required at the time were 12.48 tons and Magco actually purchased 6 tons of NOx emissions credits and 7.0 tons of VOC emission credits. Magco also provided a one-time contribution of \$2,500.00 to DNREC Coastal Program Trust Fund to assist homeowners in South Wilmington with the purchase and maintenance of trees. These two projects more than met the offset requirements for the project. Therefore, the emission limits approved in the current permit, more than cover the environmental offsets of the original operation.

The air emission estimates from the existing facility and existing dryer are based on combustion products using emission factors from US EPA AP-42 for a natural gas usage of approximately 30 million cubic feet, which was the amount used during calendar year 2014 to process approximately 197,000 tons of sea salt). The estimate also includes emissions of particulate matter from the processing of sea salt and the salt drying operations through the fluidized bed dryer. Certain control efficiencies were projected for the cyclones associated with the dryer, and the baghouses which remove particulate from the salt bagging operation. Most of the product handling sources of salt particulates is contained within the process building, here a conservative 75% control efficiency (of the building) is assumed. The sources within the building include 14 emission points from the handling and processing of salt and the emissions from the baghouses which are vented within the confines of the process building. The cyclones that control the emissions from the salt drying operation are vented outside the process building, so no control efficiency from the Process Building was considered for this source.

The Environmental Offset Plan is based on offsetting the difference in emissions between the processing of 200,000 tons of salt under the current permit and the proposed throughput increase of up to 300,000 tons of salt per year. Detailed emissions calculations are provided in Exhibit A. Over 99% of the emission increases are due to particulate emissions of sea salt from the drying and bagging process.

Since the site currently has a Coastal Zone Act Permit and the only change proposed in this permit is to increase throughput via increasing operating hours (which are currently seasonal). The project does not involve any new impacts related to storage, new equipment or changes in land use. The current property and operations are fairly self-contained and limited and does not lend itself to changes that enable onsite offsets. As such, Magco is proposing to acquire

emissions credits through the DEDO. An acquisition of NOx emissions credits will be completed concurrent with the issuance of the revised Coastal Zone Act permit.

### 3.2 Quantitative Offsetting Considerations

The following table presents a summary of estimated emissions from MAGCO's proposed operation. These emissions are based on the processing of 300,000 tons of salt per year. The estimate uses a combination of manufacturer emission data and EPA AP-42 emission factors. Details of the actual calculations are presented in spreadsheet form as Exhibit A.

Pollutant	Projected Annual Emissions (Based on 300,000 tons/yr)	Existing Permitted Emissions (Based on 200,000 tons/yr)	Overall Impact (Difference between projected emissions and the existing permitted emissions)	Estimated Required Offsets (Based on 1.3 multiplier)
	Units in Tons/year			
PM (Salt)	11.46	6.05	5.41	7.03
PM (Natural Gas)	0.13	0.07	0.06	0.08
<b>Total PM</b>	11.59	6.12	5.47	7.11
NOx	3.72	3.67	0.05	0.06
SOx	0.01	0.01	0.00	0.00
VOCs	0.20	0.30	-0.10	-0.10
			<b>Total Required Offsets</b>	7.07

Again, over 99% of the emissions that will be offset are related to sea salt particulates. The necessary offsets will be obtained through the acquisition of emission credits from the DEDO.

### 3.3 Qualitative Considerations

The Offset Plan includes purchasing NOx emissions credits to offset NOx and PM, primarily sea salt particulate emissions. No offsets are required for SOx and/or VOC's as the project will not result in any increase in these emission parameters. In fact, there is a minor decrease in VOC emissions as outlined in the table in Section 3.2.

NOx emissions cause some similar effects in the environment as PM emissions due to their ability to combine with other compounds to form small particles that lead to respiratory concerns. NOx emissions contribute to ground level ozone and visual pollution (again similar to visibility impairments caused by PM), however, NOx emissions also contribute to a wide range of additional negative environmental and health impacts, including:

- Production of acid rain which causes environmental damage to lakes and streams and property damage to cars and buildings;

- Increased nitrogen loading in water bodies, particularly coastal estuaries; and
- Being among the greenhouse gases that are a concern due to potential global climate changes.

A comparison of Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PEL) for these two pollutants reveals the PEL for NOx is 5 mg/m<sup>3</sup>, while the PEL for PM is 3 times greater at 15 mg/M<sup>3</sup>. As an added precaution, the PEL for NOx of 5mg/m<sup>3</sup> is also considered a ceiling concentration limit which is an exposure limit that should not be exceeded even for very short durations, while PM has no established ceiling concentration limit. Furthermore, the PEL for PM is established for dust which could contain any manner of chemical compounds. The PM emissions from Magco's operation are from a known source, sea salt, which is commonly consumed by humans and used in food processing and preservation.

A second source of comparison, Scorecard, a web resource for information on pollution and toxic substances, originally funded by the Environmental Defense Fund and currently operated by GoodGuide, provides pollution information and ranks compounds based on human and ecological impacts.

Scorecard indicates that PM10 has a Human Health Ranking for non-cancer risk of 0-25%, with 0 being least hazardous. (See attached Scorecard Chemical Profile in Exhibit C.) Nitrogen Dioxide has significantly higher human health ranking. NOx has a human health risk screening score based on the EPA's Waste Minimization and Prioritizing Tool of 25-75%. In addition, NOx has an Ecological Health Rank or Environmental Hazard Value score based on toxicity and persistence within the environment of 50-75%. The Human Health Ranking and the Ecological Health Ranking of NOx combine for an integrated Environmental Ranking Total Hazard score of 50-75% which indicates NOx is more toxic than PM with regard to ecological impacts. PM has no Environmental Ranking Total Hazard. This would indicate that NOx is at least 3 times more toxic with regard to human health and the environment.

Based on the above information and for the purposes of the Environmental Offset Plan, NOx is considered 3 times more toxic to humans and the environment than PM. Therefore, Magco is requesting that each ton of NOx offsets purchased from DEDO equate to 3 tons of offsets for Particulate Matter. This is considered a conservative estimate as over 98.9% of the air emissions from the proposed change consist of sea salt particulates.

The total required offsets for Magco, Inc., for the throughput capacity increase from 200,000 tons/yr to 300,000 tons/yr are outlined in the table below.

Pollutant	Offsets Required	Equivalent NOx Offsets
	Tons Per Year	
PM	7.11	2.37
NOx	0.06	0.06
Sox	0.00	0.00
VOC's	-0.10	0.00
<b>Total</b>	<b>7.07</b>	<b>2.43</b>

As presented in the table above, the total NOx offsets required to offset the proposed Magco throughput capacity 2.43 tons.

Magco will purchase 3.0 tons of offsets from DEDO. This is exceeding the required offsets by 23%.

#### **4.0 OFFSET PROJECT IMPLEMENTATION**

The acquisition of the Emissions Credits will be completed concurrent with or within 60 days of the receipt of the Coastal Zone permit, as appropriate.

#### **5.0 EXPECTED NEGATIVE IMPACTS OF PROPOSED ENVIRONMENTAL OFFSETS**

As discussed in Section 7.6 of the CZA Permit Application, the increased throughput will require increased operational hours resulting in additional employment of the facility increasing household incomes, as well as, income taxes.

#### **6.0 ATTAINMENT OF COASTAL ZONE ENVIRONMENTAL GOALS**

The proposed offsetting measure (acquisition of emissions credits) is permanent and can be expected to furnish benefits to air quality for the long term. The emission credits also provide Magco, an existing industry with a Coastal Zone, the flexibility necessary to stay competitive while adhering to the Coastal Zone Act requirement.

**Exhibit A**

*Detailed Emissions Calculations*

**Table 1 - Facility Emissions for Air Permit Application  
MAGCO INCORPORATED**

Pollutant	Projected Emissions <sup>(1)</sup>			Projected Annual Emissions (tpy)
	Uncontrolled Hourly Emissions (lb/hr)	Controlled Hourly Emissions (lb/hr)	Potential to Emit (tpy)	
PM (Sea Salt)	865.07	3.61	3788.99	11.46
PM (Dryer Fuel) <sup>2</sup>	0.04	0.04	0.19	0.13
PM	865.11	3.66	3789.17	11.59
PM10 (Sea Salt)	35.49	0.17	155.43	0.53
PM10 (Dryer Fuel) <sup>2</sup>	0.04	0.04	0.19	0.13
PM10	35.53	0.21	155.62	0.66
PM2.5 (Sea Salt)	8.23	0.044	36.04	0.14
PM2.5 (Dryer Fuel) <sup>2</sup>	0.04	0.042	0.19	0.13
PM2.5	8.27	0.086	36.22	0.27
CO	1.99	1.99	8.72	6.31
NOx	1.17	1.17	5.13	3.72
SO2	0.004	0.004	0.0186	0.0134
VOC	0.06	0.06	0.300	0.201

**Notes:**

(1) PM includes PM2.5 and PM10.

(1) PM and PM10 emissions from the Dryer Fuel are assumed to be less than 2.5 um in aerodynamic equiv. diameter (PM-2.5).

Rev. 1, October 21, 2015

**Table 2 - Projected Facility Emissions Summary for Air Permit Application  
MAGCO INCORPORATED**

Uncontrolled Hourly Emissions (lb/hr)								
Pollutant	PM	PM-10	PM-2.5	CO <sup>4</sup>	NOx <sup>4</sup>	SOx <sup>4</sup>	HC <sup>4</sup>	Total <sup>5</sup>
Table 3 - Salt Dryer <sup>1</sup>	862.71	35.37	8.24	1.99	1.17	0.0042	0.064	865.94
Table 4 - Outdoor <sup>2</sup>	0.14	0.07	0.01	n/a	n/a	n/a	n/a	0.14
Table 5 - Indoor <sup>3</sup>	2.26	0.09	0.02	n/a	n/a	n/a	n/a	2.26
<b>Total</b>	<b>865.11</b>	<b>35.53</b>	<b>8.27</b>	<b>1.99</b>	<b>1.17</b>	<b>0.0042</b>	<b>0.06</b>	<b>868.34</b>

Controlled Hourly Emissions (lb/hr)								
Pollutant	PM	PM-10	PM-2.5	CO <sup>4</sup>	NOx <sup>4</sup>	SOx <sup>4</sup>	HC <sup>4</sup>	Total <sup>5</sup>
Table 3 - Salt Dryer <sup>1</sup>	3.28	0.13	0.07	1.99	1.17	0.0042	0.064	6.51
Table 4 - Outdoor <sup>2</sup>	0.14	0.07	0.01	n/a	n/a	n/a	n/a	0.14
Table 5 - Indoor <sup>3</sup>	0.24	0.01	0.002	n/a	n/a	n/a	n/a	0.24
<b>Total</b>	<b>3.66</b>	<b>0.21</b>	<b>0.09</b>	<b>1.99</b>	<b>1.17</b>	<b>0.0042</b>	<b>0.06</b>	<b>6.89</b>

Uncontrolled Potential to Emit (ton/yr)								
Pollutant	PM	PM-10	PM-2.5	CO <sup>4</sup>	NOx <sup>4</sup>	SOx <sup>4</sup>	HC <sup>4</sup>	Total <sup>5</sup>
Table 3 - Salt Dryer <sup>1</sup>	3778.68	154.93	36.08	8.72	5.13	0.0186	0.300	3792.85
Table 4 - Outdoor <sup>2</sup>	0.60	0.29	0.05	n/a	n/a	n/a	n/a	0.60
Table 5 - Indoor <sup>3</sup>	9.89	0.41	0.09	n/a	n/a	n/a	n/a	9.89
<b>Total</b>	<b>3789.17</b>	<b>155.62</b>	<b>36.22</b>	<b>8.72</b>	<b>5.13</b>	<b>0.0186</b>	<b>0.30</b>	<b>3803.35</b>

Uncontrolled Projected Annual Emissions (ton/yr)								
Pollutant	PM	PM-10	PM-2.5	CO <sup>4</sup>	NOx <sup>4</sup>	SOx <sup>4</sup>	HC <sup>4</sup>	Total <sup>5</sup>
Table 3 - Salt Dryer <sup>1</sup>	2734.80	112.13	26.11	6.31	3.72	0.0134	0.201	2745.04
Table 4 - Outdoor <sup>2</sup>	0.43	0.21	0.03	n/a	n/a	n/a	n/a	0.43
Table 5 - Indoor <sup>3</sup>	7.26	0.30	0.07	n/a	n/a	n/a	n/a	7.26
<b>Total</b>	<b>2742.50</b>	<b>112.63</b>	<b>26.22</b>	<b>6.31</b>	<b>3.72</b>	<b>0.0134</b>	<b>0.20</b>	<b>2752.74</b>

Controlled Annual Emissions (ton/yr)								
Pollutant	PM	PM-10	PM-2.5	CO <sup>4</sup>	NOx <sup>4</sup>	SOx <sup>4</sup>	HC <sup>4</sup>	Total <sup>5</sup>
Table 3 - Salt Dryer <sup>1</sup>	10.41	0.43	0.23	6.31	3.72	0.0134	0.201	20.65
Table 4 - Outdoor <sup>2</sup>	0.43	0.21	0.03	n/a	n/a	n/a	n/a	0.43
Table 5 - Indoor <sup>3</sup>	0.75	0.03	0.01	n/a	n/a	n/a	n/a	0.75
<b>Total</b>	<b>11.59</b>	<b>0.66</b>	<b>0.27</b>	<b>6.31</b>	<b>3.72</b>	<b>0.0134</b>	<b>0.201</b>	<b>21.83</b>

**Notes:**

1

Emissions for the Carman Vibrating Fluid Bed Processing System and two (2) Carmen model CM-360 High Efficiency Dual Cyclone Dust Collectors are generated by the combustion of natural gas in the salt dryer and the creation of fugitive dust by the drying process. (See Table 2 for emissions and Table 6 for emission point details). Projected Emissions are based on increasing the hours of operation from the permitted limit of 5,000 to 6,340 hours/year.

2

ED-1 and ED-2 are the uncontrolled emission points for the outdoor transfer operations. (See Table 3 for emissions and Table 6 for emission point details). Their emissions are based on the projected throughput increase from the permitted limit of 200,000 to 300,000 tons of salt per year.

3

The 14 emission points for the controlled indoor operations are detailed in Tables 5 & 6. It is assumed that 90% of PM, PM10, and PM2.5 emissions from emission points E-2, ED-13, and ED-14 are captured by the installed baghouses. It is also assumed that the building walls prevent 75% of emissions from the remaining emission points from being transported outside the building. Their emissions are based on the projected throughput increase from the permitted limit of 200,000 to 300,000 tons of salt per year.

4

Emissions of CO, NOx, SOx, and HC are only generated during the operation of the salt dryer (natural gas combustion).

5

Total Emissions do not include PM10 and PM2.5, as these emissions are included in the PM calculations.

Rev. 0, September 22, 2015

**Table 3 - Projected Emissions Calculations for Carman Vibrating Fluid Bed Processing System  
MAGCO INCORPORATED**

Equipment <sup>2</sup>	Output <sup>8</sup>	PM Emissions <sup>1,2</sup>	PM 10 Emissions <sup>1,2</sup>	PM 2.5 Emissions <sup>1,2</sup>	CO Emissions <sup>1</sup>	NOx Emissions <sup>1</sup>	SOx Emissions <sup>3</sup>	HC Emissions <sup>1,2</sup>
Equipment <sup>2</sup> Maxon Corporation EB7MRV 400 Burner E-1	66,280 MMBTU/yr 7,061 scf/hr <sup>8</sup> 6,340 hrs/yr <sup>8</sup>	0.000 lb/MMBTU	0.000 lb/MMBTU	0.006 lb/MMBTU	0.282 lb/MMBTU	0.166 lb/MMBTU	0.0006 lb/MMBTU	0.009 lb/MMBTU
		0.00E+00 lb/scf	0.00E+00 lb/scf	6.00E-06 lb/scf	2.82E-04 lb/scf	1.66E-04 lb/scf	6.00E-07 lb/scf	9.00E-06 lb/scf
		0.00 lb/hr	0.00 lb/hr	0.04 lb/hr	1.99 lb/hr	1.17 lb/hr	0.0042 lb/hr	0.064 lb/hr
	0.00 ton/yr	0.00 ton/yr	0.13 ton/yr	6.31 ton/yr	3.72 ton/yr	0.0134 ton/yr	0.201 ton/yr	
Equipment <sup>2</sup> Salt Dryer Emissions E-1 CD-2 (Drying) <sup>5</sup>	Average Output <sup>8</sup> 300,000 tons/yr 47.31 tons/hr 6,340 hrs/yr	Uncontrolled Emissions			Controlled Emissions			
		PM Emissions <sup>5</sup>	PM 10 Emissions <sup>5</sup>	PM 2.5 Emissions <sup>5</sup>	PM Emissions <sup>6</sup>	PM 10 Emissions <sup>6</sup>	PM 2.5 Emissions <sup>6</sup>	
		2.10E+00 grain/dscf	8.61E-02 grain/dscf	2.00E-02 grain/dscf	1.10E-02 grain/dscf	4.51E-04 grain/dscf	1.05E-04 grain/dscf	
	261.40 lb/hr	10.72 lb/hr	2.48 lb/hr	1.37 lb/hr	0.06 lb/hr	0.01 lb/hr		
	828.63 ton/yr	33.97 ton/yr	7.87 ton/yr	4.34 ton/yr	0.18 ton/yr	0.04 ton/yr		
Equipment <sup>2</sup> Salt Dryer Emissions E-1 CD-2 (Cooling) <sup>5</sup>	Average Output <sup>8</sup> 300,000 tons/yr 47.31 tons/hr 6,340 hrs/yr	Uncontrolled Emissions			Controlled Emissions			
		PM Emissions <sup>7</sup>	PM 10 Emissions <sup>7</sup>	PM 2.5 Emissions <sup>7</sup>	PM Emissions <sup>7</sup>	PM 10 Emissions <sup>7</sup>	PM 2.5 Emissions <sup>7</sup>	
		4.40E+00 grain/dscf	1.80E-01 grain/dscf	4.18E-02 grain/dscf	1.40E-02 grain/dscf	5.74E-04 grain/dscf	1.33E-04 grain/dscf	
	601.32 lb/hr	24.65 lb/hr	5.71 lb/hr	1.91 lb/hr	0.08 lb/hr	0.02 lb/hr		
	1906.17 ton/yr	78.15 ton/yr	18.11 ton/yr	6.07 ton/yr	0.25 ton/yr	0.06 ton/yr		
		Total Uncontrolled PM Emissions <sup>2</sup>	Total Uncontrolled PM 10 Emissions <sup>2</sup>	Total Uncontrolled PM 2.5 Emissions <sup>2</sup>	Total Controlled PM Emissions <sup>2</sup>	Total Controlled PM 10 Emissions <sup>2</sup>	Total Controlled PM 2.5 Emissions <sup>2</sup>	
		862.71 lb/hr	35.37 lb/hr	8.24 lb/hr	3.28 lb/hr	0.13 lb/hr	0.07 lb/hr	
		2734.80 ton/yr	112.13 ton/yr	26.11 ton/yr	10.41 ton/yr	0.43 ton/yr	0.23 ton/yr	

**Notes:**

- The burner emission factors are based on detailed specification and guarantee information provided by Maxon Corp. (dated 6/1/09) for use with the Carman Vibrating Fluid Bed Processor System, by Carman Industries, Inc.
- A combined emission factor for VOC's & PM was provided by the burner manufacturer, Maxon. Therefore, individual emission factors are based on applying the ratio of 40% PM/ 60% HC for Commercial Boilers in USEPA AP-42 Table 1.5-1 (Rev. 10/96). The 40% PM emissions from the burner are assumed to be less than 2.5 um in aerodynamic eqiv. diameter (PM-2.5). (See AP-42 Section 1.4-3). Therefore, there are no PM & PM10 emissions.
- The SOx Emission factor is based on one provided for SO2 in in USEPA AP-42 Table 1.5-1 (Rev. 10/96).
- Average hours of operation are based on the dryer's operation, rather than the average annual salt throughput.
- Dust collection system used primarily for product recovery consists of two (2) Carman model CM-360 High Efficiency Dual Cyclone Dust Collectors (CD-2).
- Drying Cyclone Air Flow Rate, Dust Loading Rate, Dust Discharge Rate and Particulate Distribution per Carman Industry Cyclone Dust Collector Program Customer Data Summary, (4/30/2009).
- Cooling Cyclone Air Flow Rate, Dust Loading Rate, Dust Discharge Rate and Particulate Distribution per Carman Industry Cyclone Dust Collector Program Customer Data Summary, (4/30/2009).
- Average hourly throughput and average hourly natural gas consumption are based on the actual throughput and usage over a 5.33 year period (January 2010 through April 2015) which is the most up to date information available.

**Assumptions:**

Projected Annual Salt Throughput (ton/yr @3% Moisture)	300,000
Projected Annual Salt Throughput (ton/yr @ 1.5% Moisture)	290,700
Average Hourly Salt Input (ton/hr, @ 3% Moisture) <sup>8</sup>	47.31
Average Hourly Salt Output (ton/hr, @ 0.1% Moisture) <sup>8</sup>	45.94
Total Natural Gas Consumed/dry ton prod. (therms/ton)	2
Max. Burner Heating Capacity (MMBTU/hr)	10
Projected Hourly Natural Gas Usage Rate (scf/hr)	7,061
Projected Annual Energy Usage (MMBTU/yr) <sup>8</sup>	66,280
Projected Hours per year <sup>4</sup>	6,340
Drying Cyclone Air Flow Rate Through Stack (dscfm) <sup>6</sup>	14,522
Drying Cyclone Dust Loading Rate (inlet) (grain/ft <sup>3</sup> ) <sup>6</sup>	2.1
Drying Cyclone Dust Discharge Rate (grain/dscf) <sup>6</sup>	0.011
Cooling Cyclone Air Flow Rate Through Stack (dscfm) <sup>7</sup>	15,944
Cooling Cyclone Dust Loading Rate (inlet) (grain/ft <sup>3</sup> ) <sup>7</sup>	4.4
Cooling Cyclone Dust Discharge Rate (grain/dscf) <sup>7</sup>	0.014
Specified Maximum Firing Rate (MMBTU/hr)	10
Grains/lb of Particulate Matter	7,000
1 therm = 100 scf or 100,000 BTU	

**Table 4 - Projected Emissions Calculations for Outdoor Salt Transfer Operations (Emission Points ED-1 and ED-2)**  
MAGCO INCORPORATED

**Table 4-1 - Emissions from the discharge of salt to storage pile, based on USEPA AP-42 Table 11-19.2.2 (Rev. 8/04)**

Process	Output <sup>8</sup>	PM <sup>2.5</sup>	PM <sup>10</sup>	PM <sup>2.5</sup>
		lb/ton	lb/ton	lb/ton
Discharge to Storage Pile <sup>1,2</sup>	47.31 ton/hr <sup>4</sup> 300,000 ton/yr	1.60E-05	1.60E-05	1.60E-05
		7.57E-04	7.57E-04	7.57E-04
		4.80 lb/yr	4.80 lb/yr	4.80 lb/yr
ED-1 <sup>3</sup>		2.40E-03	2.40E-03	2.40E-03

**Outdoor Salt Transfer Emissions Summary<sup>1,2,3</sup>**

	PM 10	PM 2.5
PM		
0.14 lb/hr	0.07 lb/hr	0.01 lb/hr
869.27 lb/yr	413.67 lb/yr	66.71 lb/yr
0.43 ton/yr	0.21 ton/yr	0.03 ton/yr

**Notes:**

- (1) Emissions Calculations for Outdoor Salt Transfer Operations assumes that no controls are used in the outdoor operations. Emission factor is for PM10. Assume the same emission factor applies to PM and PM2.5.
- (2) This table provides an emission factor only for PM10, thus it is assumed for this calculation that PM=PM10=PM2.5.
- (3) 100% of the material is assumed to flow through emission point ED-1. (Refer to Table 6 for additional information on ED-1.)
- (4) Hourly Throughput is based on the actual average over a five year period (January 2010 through April 2015).

**Assumptions:**

Average Hourly Throughput <sup>4</sup>	47.31 Tons
Projected Annual Throughput	300,000 Tons
1 ton =	2,000 lbs
Material % Through ED-1	100 %

**Table 4-2**

Process	Pollutant	Silt Content <sup>(a)</sup> (%)	Moisture Content <sup>(b)</sup> (%)	k <sup>(c)</sup>	U <sup>(d)</sup> (mph)	Emission Factor <sup>(e)</sup> (lb/ton)	Throughput <sup>(f)</sup> (ton/bucket)	Number of Buckets/Hr	Maximum Hourly Emissions per drop (lb/hr)	Maximum Hourly Emissions <sup>(g)</sup> (lb/hr)	Projected Emissions (lbs/year) <sup>(g)</sup>	Projected Annual Emissions <sup>(h)</sup> (ton/yr)
Discharge to Feed Hopper <sup>(h)</sup> ED-2	PM	N/A	3.0	0.74	9.0	0.00288	5	9.5	0.014	0.136	864.471	0.432
	PM10	N/A	3.0	0.35	9.0	0.00138	5	9.5	0.007	0.064	408.871	0.204
	PM2.5	N/A	3.0	0.053	9.0	0.00021	5	9.5	0.001	0.010	61.915	0.031

**Notes:**

- (a) Silt Content is not provided as it is not included in the calculation.
- (b) Moisture content is based on the worst case scenario, based on typical moisture content of salt.
- (c) Average particle size diameter is based < 30 microns for particle size multiplier (K).
- (d) Average wind speed is based data for Wilmington, DE, obtained from National Climatic Data Center website <http://wrf.ncep.noaa.gov/realtime/online/ccdl/avgwind.html>
- (e) PM Emission factor is based on the equation shown.
- (f) Throughput is based on equipment of similar size and function.
- (g) Hourly, Daily, and Annual emissions are based on the assumptions listed below.
- (h) 100% of the material is assumed to flow through emission point ED-2. (Refer to Table 6 for additional information on ED-2.)
- (i) Emissions is based on calculation from USEPA AP-42 Section 13.2.4. No controls are assumed to be utilized in the outdoor operations.
- (j) Hourly Throughput is based on the actual average over a five year period (January 2010 through April 2015).

**Equation:**

$$E = k \left( \frac{U}{5} \right)^{1.3} \left( \frac{M}{2} \right)^{1.4}$$

E = emission factor  
 k = particle size multiplier  
 U = mean wind speed (mph)  
 M = moisture content (%)

**Assumptions:**

Assumptions:	Value
Size of Bucket Load	5 Tons
Projected Annual Throughput	300,000 Tons
Average Hourly Throughput <sup>(f)</sup>	47.31 Tons
Buckets per hour	9.5
Material % through ED-2	100 %
Buckets per year	60,000
Projected Hours/year	6,340
Hours/day	24
Moisture Content	3%
1 ton =	2,000 lbs.

Table 5 - Projected Emissions Calculations for Indoor Salt Transfer Operations (Emission Points E-2, ED-3 - ED-15)  
MAGCO INCORPORATED

Uncontrolled Emissions						Controlled Emissions					
Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5		Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5	
Conveyor Transfer Point <sup>3</sup>	47.31 ton/hr	3.00E-03 lb/ton <sup>3</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>		Conveyor Transfer Point <sup>3</sup>	47.31 ton/hr	3.00E-03 lb/ton <sup>1</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>	
	300,000 ton/yr	0.14 lb/hr	0.01 lb/hr	0.0013 lb/hr			300,000 ton/yr	0.04 lb/hr <sup>7</sup>	0.0015 lb/hr <sup>7</sup>	0.0003 lb/hr <sup>7</sup>	
	100% of total tpy	900.00 lb/yr	36.90 lb/yr	8.55 lb/yr			100% of total tpy	225.00 lb/yr	9.23 lb/yr	2.14 lb/yr	
ED-3 <sup>6</sup>		0.45 ton/yr <sup>5</sup>	0.02 ton/yr <sup>5</sup>	0.0043 ton/yr <sup>5</sup>		ED-3 <sup>6*</sup>		0.11 ton/yr <sup>5</sup>	0.0046 ton/yr <sup>5</sup>	0.0011 ton/yr <sup>5</sup>	
Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5		Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5	
Screeners <sup>5</sup>	45.94 ton/hr	2.50E-02 lb/ton <sup>8</sup>	1.03E-03 lb/ton <sup>4</sup>	2.38E-04 lb/ton <sup>4</sup>		Screeners <sup>5</sup>	45.94 ton/hr	2.50E-02 lb/ton <sup>8</sup>	1.03E-03 lb/ton <sup>4</sup>	2.38E-04 lb/ton <sup>4</sup>	
	290,700 ton/yr	1.15 lb/hr	0.05 lb/hr	0.01 lb/hr			290,700 ton/yr	0.01 lb/hr	0.0005 lb/hr	0.0001 lb/hr	
	100% of total tpy	7,500.00 lb/yr	307.50 lb/yr	71.25 lb/yr			100% of total tpy	75.00 lb/yr	3.08 lb/yr	0.71 lb/yr	
E-2 <sup>9</sup>		3.75 ton/yr <sup>5</sup>	0.15 ton/yr <sup>5</sup>	0.04 ton/yr <sup>5</sup>		E-2 <sup>9</sup>		0.04 ton/yr <sup>5</sup>	0.0015 ton/yr <sup>5</sup>	0.0004 ton/yr <sup>5</sup>	
Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5		Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5	
Conveyor Transfer Point <sup>3</sup>	45.94 ton/hr	3.00E-03 lb/ton <sup>3</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>		Conveyor Transfer Point <sup>3</sup>	45.94 ton/hr	3.00E-03 lb/ton <sup>1</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>	
	290,700 ton/yr	0.14 lb/hr	0.01 lb/hr	0.0013 lb/hr			290,700 ton/yr	0.03 lb/hr	0.0014 lb/hr	0.0003 lb/hr	
	100% of total tpy	872.10 lb/yr	35.76 lb/yr	8.28 lb/yr			100% of total tpy	218.03 lb/yr	8.94 lb/yr	2.07 lb/yr	
ED-4 <sup>6</sup>		0.44 ton/yr <sup>5</sup>	0.02 ton/yr <sup>5</sup>	0.004 ton/yr <sup>5</sup>		ED-4 <sup>6*</sup>		0.11 ton/yr <sup>5</sup>	4.47E-03 ton/yr <sup>5</sup>	1.04E-03 ton/yr <sup>5</sup>	
Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5		Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5	
Conveyor Transfer Point <sup>3</sup>	45.94 ton/hr	3.00E-03 lb/ton <sup>3</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>		Conveyor Transfer Point <sup>3</sup>	45.94 ton/hr	3.00E-03 lb/ton <sup>1</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>	
	290,700 ton/yr	0.14 lb/hr	0.01 lb/hr	0.0013 lb/hr			290,700 ton/yr	0.03 lb/hr	0.0014 lb/hr	0.0003 lb/hr	
	100% of total tpy	872.10 lb/yr	35.76 lb/yr	8.28 lb/yr			100% of total tpy	218.03 lb/yr	8.94 lb/yr	2.07 lb/yr	
ED-5 <sup>6</sup>		0.44 ton/yr <sup>5</sup>	0.02 ton/yr <sup>5</sup>	0.004 ton/yr <sup>5</sup>		ED-5 <sup>6*</sup>		0.11 ton/yr <sup>5</sup>	0.00 ton/yr <sup>5</sup>	0.001 ton/yr <sup>5</sup>	
Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5		Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5	
Conveyor Transfer Point <sup>3</sup>	45.94 ton/hr	3.00E-03 lb/ton <sup>3</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>		Conveyor Transfer Point <sup>3</sup>	45.94 ton/hr	3.00E-03 lb/ton <sup>1</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>	
	290,700 ton/yr	0.14 lb/hr	0.01 lb/hr	0.0013 lb/hr			290,700 ton/yr	0.03 lb/hr	0.0014 lb/hr	0.0003 lb/hr	
	100% of total tpy	872.10 lb/yr	35.76 lb/yr	8.28 lb/yr			100% of total tpy	218.03 lb/yr	8.94 lb/yr	2.07 lb/yr	
ED-6 <sup>6</sup>		0.04 ton/yr <sup>5</sup>	1.79E-03 ton/yr <sup>5</sup>	4.14E-04 ton/yr <sup>5</sup>		ED-6 <sup>6*</sup>		0.01 ton/yr <sup>5</sup>	4.47E-04 ton/yr <sup>5</sup>	1.04E-04 ton/yr <sup>5</sup>	
Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5		Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5	
Conveyor Transfer Point <sup>3</sup>	4.59 ton/hr	3.00E-03 lb/ton <sup>3</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>		Conveyor Transfer Point <sup>3</sup>	4.59 ton/hr	3.00E-03 lb/ton <sup>1</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>	
	29,070 ton/yr	0.01 lb/hr	5.65E-04 lb/hr	1.31E-04 lb/hr			29,070 ton/yr	3.45E-03 lb/hr	1.41E-04 lb/hr	3.27E-05 lb/hr	
	10% of total tpy	87.21 lb/yr	3.58 lb/yr	0.83 lb/yr			10% of total tpy	21.80 lb/yr	0.89 lb/yr	0.21 lb/yr	
ED-7 <sup>9</sup>		0.07 ton/yr <sup>5</sup>	2.68E-03 ton/yr <sup>5</sup>	6.21E-04 ton/yr <sup>5</sup>		ED-7 <sup>9*</sup>		0.01 ton/yr <sup>5</sup>	6.70E-04 ton/yr <sup>5</sup>	1.55E-04 ton/yr <sup>5</sup>	
Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5		Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5	
Conveyor Transfer Point <sup>3</sup>	6.89 ton/hr	3.00E-03 lb/ton <sup>3</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>		Conveyor Transfer Point <sup>3</sup>	6.89 ton/hr	3.00E-03 lb/ton <sup>1</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>	
	43,605 ton/yr	0.02 lb/hr	8.48E-04 lb/hr	1.96E-04 lb/hr			43,605 ton/yr	5.17E-03 lb/hr	2.12E-04 lb/hr	4.91E-05 lb/hr	
	15% of total tpy	130.82 lb/yr	5.36 lb/yr	1.24 lb/yr			15% of total tpy	32.70 lb/yr	1.34 lb/yr	0.31 lb/yr	
ED-7 <sup>9</sup>		0.07 ton/yr <sup>5</sup>	2.68E-03 ton/yr <sup>5</sup>	6.21E-04 ton/yr <sup>5</sup>		ED-7 <sup>9*</sup>		0.02 ton/yr <sup>5</sup>	6.70E-04 ton/yr <sup>5</sup>	1.55E-04 ton/yr <sup>5</sup>	
Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5		Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5	
Conveyor Transfer Point <sup>3</sup>	34.45 ton/hr	3.00E-03 lb/ton <sup>3</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>		Conveyor Transfer Point <sup>3</sup>	34.45 ton/hr	3.00E-03 lb/ton <sup>1</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>	
	218,025 ton/yr	0.10 lb/hr	4.24E-03 lb/hr	9.82E-04 lb/hr			218,025 ton/yr	0.03 lb/hr	1.06E-03 lb/hr	2.45E-04 lb/hr	
	75% of total tpy	654.08 lb/yr	26.82 lb/yr	6.21 lb/yr			75% of total tpy	163.52 lb/yr	6.70 lb/yr	1.55 lb/yr	
ED-8 <sup>9</sup>		0.33 ton/yr <sup>5</sup>	0.01 ton/yr <sup>5</sup>	0.003 ton/yr <sup>5</sup>		ED-8 <sup>9*</sup>		0.08 ton/yr <sup>5</sup>	0.003 ton/yr <sup>5</sup>	0.0008 ton/yr <sup>5</sup>	
Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5		Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5	
Conveyor Transfer Point <sup>3</sup>	21.82 ton/hr	3.00E-03 lb/ton <sup>3</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>		Conveyor Transfer Point <sup>3</sup>	21.82 ton/hr	3.00E-03 lb/ton <sup>1</sup>	1.23E-04 lb/ton <sup>4</sup>	2.85E-05 lb/ton <sup>4</sup>	
	138,083 ton/yr	0.20 lb/hr	0.01 lb/hr	1.87E-03 lb/hr			138,083 ton/yr	0.05 lb/hr	2.01E-03 lb/hr	4.66E-04 lb/hr	
	47.5% of total tpy	1,242.74 lb/yr	50.95 lb/yr	11.81 lb/yr			47.5% of total tpy	310.69 lb/yr	12.74 lb/yr	2.95 lb/yr	
ED-9 - ED-11 <sup>9</sup>		0.62 ton/yr <sup>5</sup>	0.03 ton/yr <sup>5</sup>	0.006 ton/yr <sup>5</sup>		ED-9 - ED-11 <sup>9*</sup>		0.16 ton/yr <sup>5</sup>	0.01 ton/yr <sup>5</sup>	0.001 ton/yr <sup>5</sup>	

**Table 5 - Projected Emissions Calculations for Indoor Salt Transfer Operations (Emission Points E-2, ED-3 - ED-15)<sup>1</sup>**  
**MAGCO INCORPORATED**

Uncontrolled Emissions						Controlled Emissions					
Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5		Equipment	Output <sup>2</sup>	PM	PM 10	PM 2.5	
Equipment Conveyor Transfer Point <sup>3</sup>	36.75 ton/hr 232,560 ton/yr 80% of total tpy	3.00E-03 lb/ton <sup>3</sup> 0.11 lb/hr 697.68 lb/yr 0.35 ton/yr <sup>5</sup>	1.23E-04 lb/ton <sup>4</sup> 4.62E-03 lb/hr 28.60 lb/yr 0.01 ton/yr <sup>5</sup>	2.85E-05 lb/ton <sup>4</sup> 1.05E-03 lb/hr 6.63 lb/yr 0.003 ton/yr <sup>5</sup>		Equipment Conveyor Transfer Point <sup>3</sup>	36.75 ton/hr 232,560 ton/yr 80% of total tpy	3.00E-03 lb/ton <sup>1</sup> 0.03 lb/hr 174.42 lb/yr 0.09 ton/yr <sup>5</sup>	1.23E-04 lb/ton <sup>4</sup> 1.13E-03 lb/hr 7.15 lb/yr 0.0036 ton/yr <sup>5</sup>	2.85E-05 lb/ton <sup>4</sup> 2.62E-04 lb/hr 1.66 lb/yr 0.0008 ton/yr <sup>5</sup>	
Equipment Conveyor Transfer Point <sup>3</sup>	36.75 ton/hr 232,560 ton/yr 80% of total tpy	3.00E-03 lb/ton <sup>3</sup> 0.22 lb/hr 1,395.36 lb/yr 0.70 ton/yr <sup>5</sup>	1.23E-04 lb/ton <sup>4</sup> 0.01 lb/hr 57.21 lb/yr 0.03 ton/yr <sup>5</sup>	2.85E-05 lb/ton <sup>4</sup> 2.09E-03 lb/hr 13.26 lb/yr 0.007 ton/yr <sup>5</sup>		Equipment Conveyor Transfer Point <sup>3</sup>	36.75 ton/hr 232,560 ton/yr 80% of total tpy	3.00E-03 lb/ton <sup>1</sup> 2.21E-03 lb/hr 13.95 lb/yr 0.01 ton/yr <sup>5</sup>	1.23E-04 lb/ton <sup>4</sup> 9.04E-05 lb/hr 0.57 lb/yr 0.0003 ton/yr <sup>5</sup>	2.85E-05 lb/ton <sup>4</sup> 2.08E-05 lb/hr 0.13 lb/yr 0.0001 ton/yr <sup>5</sup>	
Equipment Conveyor Transfer Point <sup>3</sup>	9.19 ton/hr 58,140 ton/yr 20% of total tpy	3.00E-03 lb/ton <sup>3</sup> 0.03 lb/hr 174.42 lb/yr 0.09 ton/yr <sup>5</sup>	1.23E-04 lb/ton <sup>4</sup> 1.13E-03 lb/hr 7.15 lb/yr 0.004 ton/yr <sup>5</sup>	2.85E-05 lb/ton <sup>4</sup> 2.62E-04 lb/hr 1.66 lb/yr 0.0008 ton/yr <sup>5</sup>		Equipment Conveyor Transfer Point <sup>3</sup>	9.19 ton/hr 58,140 ton/yr 20% of total tpy	3.00E-03 lb/ton <sup>1</sup> 0.01 lb/hr 43.61 lb/yr 0.02 ton/yr <sup>5</sup>	1.23E-04 lb/ton <sup>4</sup> 2.83E-04 lb/hr 1.79 lb/yr 0.0009 ton/yr <sup>5</sup>	2.85E-05 lb/ton <sup>4</sup> 6.55E-05 lb/hr 0.41 lb/yr 0.0002 ton/yr <sup>5</sup>	
<b>Uncontrolled Salt Transfer Emissions Summary<sup>3,4,5</sup></b>						<b>Controlled Salt Transfer Emissions Summary<sup>3,4,5</sup></b>					
		PM	PM 10	PM 2.5				PM	PM 10	PM 2.5	
		2.26 lb/hr	0.09 lb/hr	0.02 lb/hr				0.24 lb/hr	0.01 lb/hr	0.002 lb/hr	
		14526.50 lb/yr	595.59 lb/yr	138.00 lb/yr				1496.74 lb/yr	61.37 lb/yr	14.22 lb/yr	
		7.26 ton/yr	0.30 ton/yr	0.07 ton/yr				0.75 ton/yr	0.031 ton/yr	0.007 ton/yr	

**Notes:**

- This table summarizes the emissions from operations inside the processing building (one screener and 13 conveyor transfer points). Refer to Table 6 and Process Flow Diagrams for additional information on emission points.
- Average Hourly Throughput is based on the actual average over a five year period (January 2010 through April 2015).
- PM Emission factors are based on those for Conveyor Transfer Points (USEPA AP-42 Table 11-19.2-2 [Rev. 8/04]).
- Particulate Distribution per Carman Industry Cyclone Dust Collector Program Customer Data Summary, (4/30/2009).
- Based on the number of emission points identified, i.e. ED-6, ED-8 - ED-10, etc.
- Emissions from Emission Point ED-3 (before the dryer) typically have a moisture content of 1.5%. The average throughput of 47.31 ton/hr reflects the 1.5% moisture.
- The process building (275 feet by 300 feet with four 25 feet wide overhead doors) provides an approximate 90% enclosure to prevent wind dispersion (1050 feet of wall/1150 feet of building perimeter). Although the building's two roof vents provide a minimal discharge of 3500 cfm each, there would be one building air change per 8 hour shift. Consequently, a conservative control efficiency of 75% is applied to the emissions from emission points ED-3 - ED-12 and ED-15.
- PM Emission factors are based on those for Screening (USEPA AP-42 Table 11-19.2-2 [Rev. 8/04]). PM2.5 emissions are assumed to be equal to PM10 emissions.
- Emissions from Emission Points ED-4 through ED-15 (after the dryer) have a lower moisture content (0.1%). The average throughput of 45.94 ton/hr reflects the 0.1% moisture.
- Two baghouses (CD-3 & CD-4) control emissions from Emission Points E-2, ED-13, and ED-14. Although baghouse efficiency is typically 99.9%, a conservative 99% removal efficiency is used.

**Assumptions:**

- Average Hourly Salt Input (to dryer, @3% Moisture)<sup>2</sup> 47.31 Tons
- Average Hourly Salt Output (from dryer, @ 0.1% Moisture)<sup>2</sup> 45.94 Tons
- Projected Annual Throughput (wet) 300,000 Tons
- Projected Annual Throughput (dry) 290,700 Tons
- Projected Hours/year (dryer operation) 6,340 Hours
- 1 ton 2,000 lbs
- PM, PM-10, and PM-2.5 Capture Efficiency (baghouses)<sup>7</sup> 99 %
- PM, PM-10, and PM-2.5 capture efficiency (building)<sup>10</sup> 50 %

**Exhibit B**

*Coastal Zone Environmental Impact  
Offset Matrix*

COASTAL ZONE ENVIRONMENTAL IMPACT OFFSET MATRIX

Applicant: MAGCO, INC.  
 Project: Throughput Capacity Increase at the Existing Sea Salt Packaging Facility  
 CZA Offset Review Reference: (DNREC Only)

Page 1 of 1  
 Application Date: November 2015  
 Amendments:  
 Offset Review Date: (DNREC Use Only)  
 Matrix Amended:

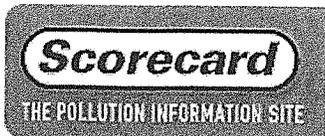
ENVIRONMENTAL IMPACTS	(Applicant's Use) DESCRIBE ENVIRONMENTAL IMPACTS	PAGE NO.	(Applicant's Use) DESCRIBE ENVIRONMENTAL OFFSET PROPOSAL <sup>1</sup>	PAGE NO.	(DNREC Use Only) OFFSET SUFFICIENCY Yes, No or N/A
Air Quality (Applicant to List Below by Parameter)					
PM	Estimated increase of 5.47 tons per year.	Pg. 1 of Environmental Offset Plan	MAGCO will obtain emissions credits from DEDO which will more than offset the environmental impacts. A total of 3 tons of NOx air emissions credits will be obtained.	See Environmental Offset plan	
CO	Estimated increase of 0.66 tons per year. <sup>1</sup>	Pg. 1 of Environmental Offset Plan			
NOX	Estimated increase of 0.05 tons per year.	Pg. 1 of Environmental Offset Plan			
SO2	Estimated increase of 0.00 tons per year.	Pg. 1 of Environmental Offset Plan			
HC	Estimated increase of -0.10 tons per year.	Pg. 1 of Environmental Offset Plan			
Water Quality					
Surface	No impact				
Groundwater	No impact				
Water Quantity					
Surface	No impact				
Groundwater	No impact				
Water Use For:					
Processing	No impact				
Cooling	No impact				
Effluent Removal	No impact				
Solid Waste	A small amount of solid waste, generated from packaging and shipping materials, will be disposed of off-site.	20			
Hazardous Waste	No impact				
Habitat	No impact			See Environmental Offset Plan	
Wetlands	No impact				
Flora Fauna	No impact				
Drainage/Flood Control	No impact				
Erosion	No impact				
Land Use Effects					
Glare	No impact				
Heat	No impact				
Noise	No impact				
Odors	No impact				
Vibration	No impact				
Radiation	No impact				
Electro-Magnetic Interference	No impact				
Other Effects	None				
Threatened & Endangered Species	No impact.				
Impacts From:					
Raw Material	Not applicable.				
Intermediate Products	Not applicable.				
By-Products	Not applicable.				
Final Products	Not applicable.				

<sup>1</sup> No offsets required per pre-application meeting with K. Koyle and P. Cherry held August 8, 2015"

**Exhibit C**

*Chemical Hazard Profiles*

*Nitrogen Dioxide*



**Investigate  
Pollution Topics**

**TOXICS**

- ▶ Toxic Chemical Releases
- ▶ Lead Hazards
- ▶ Superfund

**AIR**

- ▶ Smog and Particulates
- ▶ Hazardous Air Pollutants

**WATER**

- ▶ Clean Water Act
- ▶ Watershed Indicators

**AGRICULTURE**

- ▶ Animal Waste

**ENVIRONMENTAL JUSTICE**

- ▶ Community Center
- ▶ En Español

**HEALTH HAZARDS**

- ▶ [Chemical Profiles](#)
- ▶ Health Effects
- ▶ Regulations

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**CHEMICAL PROFILES | Hazard Rankings**

**Chemical:** [NITROGEN DIOXIDE](#)

**CAS Number:** 10102-44-0

Least Hazardous Most Hazardous

Percentile  
25% 50% 75% 100%

**Human Health Rankings**

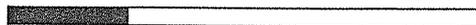
Toxicity and persistence

Human Health Risk Screening Score (WMPT)

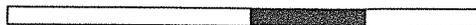


Toxicity and exposure potential

Noncancer Risk Score - Air Releases (EDF)



Noncancer Risk Score - Water Releases (EDF)



Worker Exposure Hazard Score (IRCH)



**Ecological Health Rankings**

Toxicity and persistence

Environmental Hazard Value Score (IRCH)



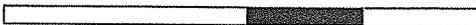
Ecological Risk Screening Score (WMPT)



**Integrated Environmental Rankings**

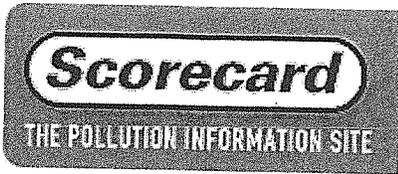
Combined human and ecological scores

Total Hazard Value Score (IRCH)



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**Investigate  
Pollution Topics**

**TOXICS**

- ▶ Toxic Chemical Releases
- ▶ Lead Hazards
- ▶ Superfund

**AIR**

- ▶ Smog and Particulates
- ▶ Hazardous Air Pollutants

**WATER**

- ▶ Clean Water Act
- ▶ Watershed Indicators

**AGRICULTURE**

- ▶ Animal Waste

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**HEALTH HAZARDS**

- ▶ Chemical Profiles
- ▶ Health Effects
- ▶ Regulations

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**CHEMICAL PROFILES | Chemical Profile**

**Chemical:** NITROGEN DIOXIDE  
**CAS Number:** 10102-44-0

**Chemical Profile for NITROGEN DIOXIDE  
(CAS Number: 10102-44-0)**

- [Human Health Hazards](#)
- [Hazard Rankings](#)
- [Chemical Use Profile](#)
- [Rank Chemicals by Reported Environmental Releases in the United States](#)
- [Regulatory Coverage](#)
- [Basic Testing to Identify Chemical Hazards](#)
- [Information Needed for Safety Assessment](#)
- [Links](#)

• [Human Health Hazards](#)

Health Hazard	Reference(s)
Recognized: --	
Suspected: <a href="#">Cardiovascular or Blood Toxicant</a>	<a href="#">CAA-AQC RTECS</a>
<a href="#">Developmental Toxicant</a>	<a href="#">CAA-AQC</a>
<a href="#">Endocrine Toxicant</a>	<a href="#">RTECS</a>
<a href="#">Immunotoxicant</a>	<a href="#">CAA-AQC IPCS RTECS</a>
<a href="#">Neurotoxicant</a>	<a href="#">CAA-AQC DAN RTECS</a>
<a href="#">Reproductive Toxicant</a>	<a href="#">JANK</a>
<a href="#">Respiratory Toxicant</a>	<a href="#">CAA-AQC HAZMAP</a> <a href="#">LADO OEHHA-AREL</a> <a href="#">OEHHA-CREL RTECS</a>
<a href="#">Skin or Sense Organ Toxicant</a>	<a href="#">KLAA RTECS</a>

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- **Hazard Rankings**

More hazardous than most chemicals in 3 out of 7 ranking systems.

[ [top](#) ]

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- **Chemical Use Profile**

No data on industrial or consumer use in Scorecard.

[ [top](#) ]

---

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- **Rank Chemicals by Reported Environmental Releases in the United States**

No data on environmental releases in Scorecard.

[ [top](#) ]

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- **Regulatory Coverage**

On at least 6 federal regulatory lists.

[ [top](#) ]

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- **Basic Testing to Identify Chemical Hazards**

Comprehensive evaluation of hazards has been conducted to establish a National Ambient Air Quality Standard.

[ [top](#) ]

---

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- **Information Needed for Safety Assessment**

Lacks at least some of the data required for safety assessment.

See risk assessment data for this chemical from U.S. EPA or Scorecard.

[ [top](#) ]

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- **Links**

Additional information about this chemical may be available elsewhere in Scorecard.

Other web sites specific to this chemical:

- [EPA Air Quality Criteria for Oxides of Nitrogen](#)
- [EPA Integrated Risk Information System Report](#)
- [IPCS International Chemical Safety Card](#)
- [International Toxicity Estimates for Risk \(ITER\) from Toxicology Excellence for Risk Assessment](#)
- [National Institute for Occupational Safety and Health Pocket Guide to Chemical Hazards](#)
- [New Jersey Fact Sheet](#)

If none of these sources meet your needs, you can try searching [some other chemical database Web sites](#).

[ [top](#) ]

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- **Notes**

[ [top](#) ]

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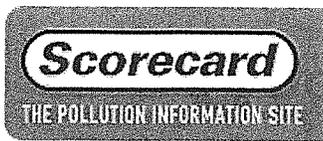
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[bill@goodguide.com](mailto:bill@goodguide.com)

*Particulate Matter*



Investigate  
Pollution Topics

**TOXICS**

- ▶ Toxic Chemical Releases
- ▶ Lead Hazards
- ▶ Superfund

**AIR**

- ▶ Smog and Particulates
- ▶ Hazardous Air Pollutants

**WATER**

- ▶ Clean Water Act
- ▶ Watershed Indicators

**AGRICULTURE**

- ▶ Animal Waste

**ENVIRONMENTAL JUSTICE**

- ▶ Community Center
- ▶ En Español

**HEALTH HAZARDS**

- ▶ Chemical Profiles
- ▶ Health Effects
- ▶ Regulations

**ZIP TO YOUR COMMUNITY**

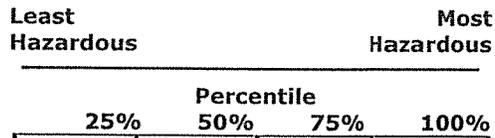
GO ▶

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**CHEMICAL PROFILES | Hazard Rankings**

Chemical: PM 10  
CAS Number: EDF-077



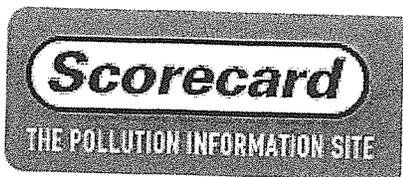
**Human Health Rankings**

Toxicity and exposure potential



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### Investigate Pollution Topics

#### TOXICS

- ▶ Toxic Chemical Releases
- ▶ Lead Hazards
- ▶ Superfund

#### AIR

- ▶ Smog and Particulates
- ▶ Hazardous Air Pollutants

#### WATER

- ▶ Clean Water Act
- ▶ Watershed Indicators

#### AGRICULTURE

- ▶ Animal Waste

#### ENVIRONMENTAL JUSTICE

- ▶ Community Center
- ▶ En Español

#### HEALTH HAZARDS

- ▶ [Chemical Profiles](#)
- ▶ [Health Effects](#)
- ▶ [Regulations](#)

#### ZIP TO YOUR COMMUNITY

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#### SEARCH SCORECARD

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### CHEMICAL PROFILES | Chemical Profile

**Chemical:** PM 10  
**CAS Number:** EDF-077

### Chemical Profile for PM 10 (CAS Number: EDF-077)

- [Human Health Hazards](#)
- [Hazard Rankings](#)
- [Chemical Use Profile](#)
- [Rank Chemicals by Reported Environmental Releases in the United States](#)
- [Regulatory Coverage](#)
- [Basic Testing to Identify Chemical Hazards](#)
- [Information Needed for Safety Assessment](#)
- [Links](#)

#### • [Human Health Hazards](#)

##### Health Hazard

Recognized: --

Suspected: [Carcinogen](#)

[Cardiovascular or Blood Toxicant](#)

[Developmental Toxicant](#)

[Reproductive Toxicant](#)

[Respiratory Toxicant](#)

##### Reference (s)

[P65-MC](#)

[CAA-AQC](#)

[P65-MC](#)

[P65-MC](#)

[CAA-AQC](#)

[ top ]

#### • [Hazard Rankings](#)

Less hazardous than most chemicals in 1 ranking system.

[ top ]

- **Chemical Use Profile**

No data on industrial or consumer use in Scorecard.

[ [top](#) ]

---

- **Rank Chemicals by Reported Environmental Releases in the United States**

For a list of the geographic areas or facilities which report the largest releases of Criteria Air Pollutants, select what you want:

- [Rank States](#)
- [Rank Counties](#)
- [Rank Facilities](#)

[ [top](#) ]

---

- **Regulatory Coverage**

On at least 1 federal regulatory list.

[ [top](#) ]

---

- **Basic Testing to Identify Chemical Hazards**

Comprehensive evaluation of hazards has been conducted to establish a National Ambient Air Quality Standard.

[ [top](#) ]

---

- **Information Needed for Safety Assessment**

Lacks at least some of the data required for safety assessment.

See risk assessment data for this chemical from U.S. EPA or Scorecard.

[ [top](#) ]

---

- **Links**

Additional information about this chemical may be available elsewhere in Scorecard.

Other web sites specific to this chemical:

- [CalEPA Air Resources Board Pollutant Monitoring](#)
- [EPA Air Quality Criteria for Particulate Matter](#)
- [EPA Final Rule for Particulate Matter NAAQS](#)
- [EPA Greenbook on Criteria Air Pollutants](#)
- [EPA Office of Air and Radiation Criteria Pollutant Fact Sheet](#)
- [EPA Office of Air and Radiation Fact Sheet on PM Health Effects](#)
- [EPA Office of Air and Radiation Fact Sheet on PM Standard](#)

