



# Benson Aluminum Dynamics Air Quality



## Community Info Sheet

Aluminum Dynamics, Inc. (ADI) submitted to ADEQ for an air quality permit for its proposed aluminum recycling facility in Benson, AZ.

### What Air Pollutants Were Reviewed in the Air Quality Permit Submitted by Aluminum Dynamics?

- Since the facility is within 2 miles or less of a “learning site” or school, the facility needs to model, or develop estimates based on a simulation of the site, how hazardous air pollutants will be emitted
- The air pollutants modeled are:



#### Carbon Monoxide

A colorless and practically odorless gas, can cause flu-like symptoms and can be fatal at high concentrations<sup>4</sup>



#### Nitrogen Dioxide

A gas from combustion, such as cars, trucks, or industry. Can react to create ozone, which is harmful on the lungs<sup>2</sup>



#### Particulate Matter

Particles with diameters of 10 micrometers (1/5 the width of human hair) or smaller and can be inhaled into upper respiratory system. Includes dust, pollen, mold, and can cause health problems<sup>3</sup>



#### Particulate Matter

Particles with diameters of 2.5 micrometers or less. These particles are small enough to get into your lungs and bloodstream and pose a greater risk to your health than PM<sub>10</sub><sup>3</sup>



#### Hazardous Air Pollutants

Air pollutants that are known to be toxic, such as mercury, and cause significant health effects<sup>3</sup>

### How Did They Model Air Pollution?

- The model was created using the EPA American Meteorological Society/Environmental Protection Agency Regulatory Model (AERMOD). Weather data was forecasted using a model developed by the University of North Carolina Institute in collaboration with the EPA.
- The forecasted weather data was compared with weather data from Sierra Vista Municipal Airport and Tucson International Airport to ensure accurate estimates.
- Background concentrations of pollutants were not available at the proposed site, so ADI chose representative sites (listed in table below) that were nearby and had as similar conditions as possible. The data for the past three years was used in the model.

### What were the pollutants estimated?

#### Cumulative Impact Analysis Result (From Aluminum Dynamics ADEQ Air Permit)

Pollutant	Estimated Total Concentration for Time Period ( $\mu\text{g}/\text{m}^3$ )	Baseline Values from 2024 ADEQ Air Quality Summary Report <sup>6</sup> ( $\mu\text{g}/\text{m}^3$ )	Percent Increase due to Facility	National Ambient Air Quality Standards (NAAQS) ( $\mu\text{g}/\text{m}^3$ )	Greater than NAAQS?
NO <sub>2</sub> (1-hr period)	139.6	62.9 (Children's Park, Tucson)	121%	188	No
NO <sub>2</sub> (annual mean)	14.83	13.44 (Children's Park, Tucson)	10.3%	100	No
PM <sub>10</sub> (24 hr period)	67.3	43 (Green Valley)	56.5%	150	No
PM <sub>2.5</sub> (24 hr period)	21.07	21 (Children's Park, Tucson)	0.33%	35	No
PM <sub>2.5</sub> (annual mean)	8.1	6.1 (Children's Park, Tucson)	32.7%	9	No

“1-hour period” = Air pollution level is estimated or averaged over a single hour

“24-hour period” = Air pollution level is estimated or averaged over a full day (24 hours)

“Annual mean” = Average amount of pollution in the air over an entire year

National Ambient Air Quality Standards - Federal air quality standards set by the EPA through the Clean Air Act

$\mu\text{g}/\text{m}^3$  means micrograms per cubic meter and in this context, it indicates the air pollutant concentration

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### Hazardous Air Pollutants Results

- ADEQ has established acute ambient air concentrations (AAAC) and chronic ambient air concentrations (CAAC) for toxic pollutants identified as HAPs<sup>5</sup>.

Modeled Pollutant	1 hr Scaled Concentration ( $\mu\text{g}/\text{m}^3$ )	Annual Scaled Concentration ( $\mu\text{g}/\text{m}^3$ )	ATS 2020 Ambient Concentrations ( $\mu\text{g}/\text{m}^3$ )	AAAC Threshold ( $\mu\text{g}/\text{m}^3$ )	CAAC Threshold ( $\mu\text{g}/\text{m}^3$ )
Hydrogen Chloride	27.9	.726	.0620	16,000	20.9
Antimony	.000241	.00000539	0	13,000	1.46
Arsenic	.000105	.00000182	.0000295	2,500	.000441
Beryllium	.000219	.0000033	.00000210	13	.00079
Cadmium	.000445	.0000084	.00000424	250	.00105
Chromium VI	.000374	.00000636	.00000151	100	.000158
Cobalt	.000196	.00000319	.0000000249	10,000	.000686
Manganese	.343	.00646	.0000906	2,500	.0521
Mercury, elemental	.0000677	.00000117	.00000851	1,000	.313
Nickel	.00277	.0000443	.0000675	5,000	.0079
Selenium	.000109	.00000227	.000003.05	500	18.3
Benzene	.413	.0107	.0518	1,276,000	.243
Formaldehyde	.0188	.000321	.927	17,000	.146
Naphthalene	.340	.00880	.00913	75,000	.0558
Toluene	.376	.00972	.0425	1,923,000	5,210
Acrylonitrile	.118	.00305	.0000576	38,000	.0279
Carbon Disulfide	.296	.00767	.0000147	311,000	730
Carbon Tetrachloride	.00159	.0000412	.428	201,000	.126
Chloroform	.0238	.000616	.0624	195,000	.358
Tetrachloroethene	.00410	.000106	.00962	814,000	.32
Trichloroethene	.00193	.0000501	.000244	1,450,000	.0168
Total POM	.0000699	.000000620	0	5,000	.00202
Total Dibenzofurans	.0000107	.0000000238	.0000142	25,000	7.3

### How This Impacts You

- All modeled air pollution levels from ADI are below the legal standards, meaning there is a margin between what is predicted and what is allowed by law.
  - The closest any result comes to the limit is for PM<sub>2.5</sub> averaged over a year, but even that is still only 60% of the standard.
- The model takes into account existing background concentrations of pollutants. Even with the facility operating, there are no expected NAAQs or HAPs violations.
- The model used conservative (worst-case) assumptions, so real-world levels of pollutants are likely to be lower.



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- This table includes modeled concentrations from the ADI air permit, as well as the 2020 EPA AirToxScreen (ATS) values of background pollutant concentrations in the proposed area in Benson



**Acute ambient air concentration (AAAC)** - concentration that poses health impacts if contact occur for one hour



**Chronic ambient air concentration (CAAC)** - concentration that poses a health impact if contact occurs longer than a year

None of the modeled HAPs' concentrations exceeded either acute ambient air concentration or chronic ambient air concentration

### References

- Agency for Toxic Substances and Disease Registry. "Hydrogen Chloride | ToxFAQs™ | ATSDR." [www.cdc.gov/atsdr/toxfaqs/toxfaqsdetails.aspx?faqid=759&toxid=147](http://www.cdc.gov/atsdr/toxfaqs/toxfaqsdetails.aspx?faqid=759&toxid=147).
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- US EPA. "What Are Hazardous Air Pollutants? | US EPA." US EPA, 3 Dec. 2015, [www.epa.gov/haps/what-are-hazardous-air-pollutants](http://www.epa.gov/haps/what-are-hazardous-air-pollutants).
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- Arizona Department of Environmental Quality. "AQD | Air Dispersion Modeling | ADEQ." [azdeq.gov](http://azdeq.gov), 2025, [azdeq.gov/AirDispersionModeling](http://azdeq.gov/AirDispersionModeling).
- Pima County Department of Environmental Quality. 2024 Air Quality Summary Report. Pima County, May 2025.