

Air Quality



Metro

METRO ENVIRONMENTAL CONSTRUCTION
AWARENESS (MECA) PROGRAM

Welcome to Metro's Environmental Construction Awareness – MECA – Program module on air quality.

Metro is partnering with its contractors to transform Los Angeles into a more breathable city. During this journey, we're asking you to think differently with us about how to plan and perform your work while minimizing air emissions.

Air quality



Calculated based on levels of:

- > Particulate matter (PM)
- > Ground-level ozone (O₃)
- > Carbon monoxide (CO)
- > Sulfur dioxides (SO_x)
- > Nitrogen dioxides (NO_x)



Air quality is defined as the extent to which ambient air is pollution-free. Air quality is measured using a variety of indicators. The Environmental Protection Agency calculates air quality using five major pollutants regulated by the Clean Air Act: particulate matter, ground-level ozone, carbon monoxide, sulfur dioxides, and nitrogen dioxides.

Although air quality has improved since the 1970s, according to the American Lung Association, Los Angeles currently ranks as having the worst ground-level ozone of any city in the United States and remains in the top of cities with the worst air quality based on particle pollution.

Metro is helping reduce emissions from construction activities related to diesel exhaust, which includes carbon monoxide, sulfur dioxides, and nitrogen dioxides. This topic is discussed in depth in the *Green Construction Policy* MECA Module, which is available through this website.

Source: <http://www.lung.org/our-initiatives/healthy-air/sota/city-rankings/most-polluted-cities.html>

Fugitive dust



Air can be polluted by particulate matter (PM) that becomes airborne during construction and demolition activities:

- > Soil disturbing activities
- > Truck track-out
- > Uncovered stockpiles
- > Soil remediation



Silica dust clouds from trucks loading into sand movers



Air quality is affected by construction activities that suspend particulate matter, called “PM”, in the air, creating what is known as *fugitive dust*.

If not properly controlled, fugitive dust can be formed during construction and demolition such as:

- Soil disturbing activities, including land clearing, grading, and excavation;
- Trucks traveling into and out of the work area, including loading and unloading activities;
- Uncovered stockpiles of gravel and rock, including associated crushing operations; and
- Soil remediation.

Image credit: NIOSH

Air pollution impacts the community



If not properly controlled, air pollutants can potentially:

- > Impact our long-term health
- > Cause a life-threatening situation
- > Damage property and/or equipment



If not properly controlled, air pollutants can have negative impacts on our health and the environment. Communities — even those near each other — can be at different levels of risk related to unique negative impacts, requiring us to understand the specific characteristics of the area in which we are working.

Air pollutants can be in gas form. Hydrogen sulfide emitted from equipment is a highly flammable, explosive gas. If handled improperly, it could ignite and cause a life-threatening situation.

Air pollutants can also damage property or equipment, particularly if they accumulate.

Image: Photo by [Shelby Miller](#) on [Unsplash](#)

Air pollution impacts workers



Fugitive dust must be contained to protect workers and others



Proper respiratory protections for workers and dust control are a priority



Fugitive dust from contaminated soil may contain toxic compounds. When airborne, these contaminants can be breathed in or ingested causing elevated health risks for those nearby.

Construction activities, like cutting, grinding, drilling or crushing materials that contain crystalline silica, can cause long term, debilitating respiratory diseases.

If this fugitive dust is absorbed into the body through the lungs, these small particles can pass through cell walls disrupting cell function, aggravating asthma, respiratory problems, organ damage, or even causing more severe health issues.

Image: Photo courtesy of iqpowertools.com

Metro leads



- > Control air pollution
- > Innovate through planning
- > Coordinate best practices with contractors
- > Be a good neighbor
- > Minimize activities that give rise to complaints



Soil wetted to prevent fugitive dust



Metro wants to help control and improve regional air quality while transforming Los Angeles through innovative planning and coordinated efforts with our contractors.

Metro strives to be a good neighbor, taking steps to minimize activities that create air quality issues. We aim to maintain and deepen our relationships with the local communities in which we work and operate.

Image: Metro

Tunnel ventilation systems



Carbon absorption scrubber systems are designed to control:

- > Gases produced by soil and groundwater reactions
- > Volatile organic compounds (VOCs) from heavy equipment



*Tunnel ventilation system
Purple Line Extension, Section 1*

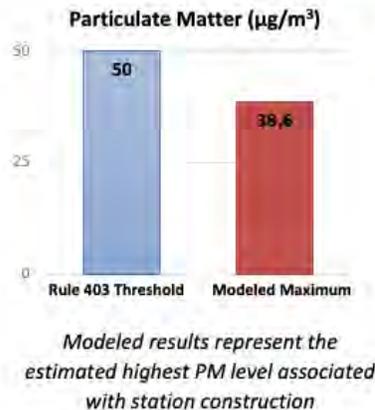


For example, tunnel ventilation systems are designed to remove harmful gases from tunnel operations. On the Purple Line Extension Section 1, Contractors recognized that tunnel operations can release gases, such as hydrogen sulfide, produced by the reaction between soil and groundwater and volatile organic compounds, or VOCs, can be produced by heavy equipment operating underground.

The carbon absorption scrubber system installed on the tunnel ventilation system was designed to treat the air and remove such contaminants before they could be released into the community.

Compliance

- > Compliance with federal, state, and local laws
- > CalOSHA
- > SCAQMD:
 - > Rule 403
 - > Rule 1466
 - > Rule 203



Metro must comply with applicable federal, state and local laws. Since air quality is uniquely tied to worker's health, some requirements will also fall under Cal-OSHA safety and should be addressed by the appropriate submittals.

In addition, the South Coast Air Quality Management District (SCAQMD) has several rules that pertain to Metro construction activities:

- Rule 403 relates to sites that emit fugitive dust.
- Rule 1466, effective as of January 1, 2018, is applicable to hazardous waste sites or sites with contaminated soils.
- Rule 203 requires proper operation of equipment, including scrubbers for tunnel ventilation systems.

In each case, the rules set a threshold for the amount of PM that can be produced. It is the responsibility of the Contractor to plan the project with strategies in place to stay below these levels. To do this requires research and planning.

Metro's commitment



- > Environmental Impact Report (EIR)
- > Environmental Impact Study (EIS)
- > Project Mitigation Monitoring and Reporting Plan (MMRP)
- > Metro Rail Design Criteria (MRDC)
- > General Requirements (GRs) and specifications



In addition, Metro and our Contractors must adhere to project-specific documents put in place to ensure that air quality is adequately controlled, not only to meet obligations with laws and ordinances, but to meet and exceed Metro's commitment to the community to be a leader in environmental practices.

Some projects have an EIR or EIS which guides project implementation and includes an MMRP with specific goals and strategies to minimize air pollution.

MRDCs and GRs provide additional guidance. For example, the Temporary Environmental Controls Specification outlines the Contractor's responsibility in developing plans, notifications, and submittals, many of which are introduced in this module with samples provided for download.

As a partner in construction projects, Metro takes an active role in ensuring that contractors have sound plans and procedures to control air quality.

Framework for a successful project



Build a strong team

- > Certified Dust Control Supervisor
- > Air Pollution Control Representative



Successful capital projects begin with a strong and knowledgeable team that includes a Dust Control Supervisor and Air Pollution Control Representative.

SCAQMD has mandatory training and certification for these essential members of your construction team. See MECA's module on creating *Your Environmental Team* for more information.

Framework for a successful project



- > Build a strong team
- > Develop Plan
 - > Understand ambient air quality
 - > Identify potential sources of fugitive dust
 - > Describe how to prevent and control dust from activities
 - > Track air quality through the life of the project
 - > Adjust activity based on data



A framework for a successful project includes development of a plan with air quality in mind. A project may be required to develop a Fugitive Dust Control Plan. This is typically triggered when active operations on the property involve more than 50 acres of disturbed surface area.

Your project's plan should begin with a clear understanding of local air quality and identify potential sources of fugitive dust throughout the life of the project. Then, describe how to both prevent creating such dust and what to do about any that you expect to occur from construction activities.

This includes identifying processes, procedures, monitoring strategies, and controls. Be sure to include your contingency plan for unexpected sources of dust as well.

The best practices identified in your Fugitive Dust Control Plan will likely reinforce many of the elements in your SWPPP. See the MECA module on *Stormwater Best Management Practices* for related information.

Best Practices for Controlling Dust



Cover truck beds



Control trash on-site



Stabilize material



Prevent track-out



There are many methods Contractors and their workers can use to keep emissions as low as possible.

- Cover truck beds to control dust during transport of spoils from the point of origin to unloading. Additionally, leave at least 6 inches of freeboard in haul vehicles.
- Keep the site free of loose trash or debris.
- Stabilize soil using methods like pre-watering material to keep it on site and under control.
- Use shake plates or gravel areas to prevent track-out of more than 25 feet beyond active operations.

More strategies are available through SCAQMD and the Stormwater MECA module.

Volatile Organic Compounds



- > Plan for proper handling of VOC-contaminated soil
- > Soils that register greater than 50ppm
- > Know storage requirements and 2,000 yard³ limit



Use scrubbers



Cover stockpiles and use vapor suppressants



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If your project is expected to encounter Volatile Organic Compounds, be ready to test soil on a regular basis. Encountering soils that register 50ppm or greater using a hydrocarbon monitor known as an organic vapor analyzer (OVA) require special treatment.

Contractors may be required to have Site Specific Mitigation Plans, which include stockpiling methods for VOC-contaminated soils. Handling of these materials may be within your Hazardous and Contaminated Waste Management Plan. More information about this plan and certifications for those handling such materials are covered in the *Hazardous Waste MECA* module.

Dust suppression is especially important for VOC-contaminated soils. Techniques such as plastic sheeting and the use of vapor suppressants should be utilized. Carefully note requirements related to communication, stockpiling, and storage period limits.

Contractors may need to provide air scrubbers as part of the temporary

ventilation system for tunnels and stations, depending on the project. These carbon-based scrubber units remove hydrogen sulfide and VOCs from the air.

Image: Tunnel Ventilation System – PLE1 (Metro)

Know what's in the air



- > Post notifications prior to activity
- > Maintain signage
- > Implement specific operational activities needed to control dust
- > Conduct air sampling activities
- > Keep daily records of dust control measures

Signage Requirements

"THIS SITE CONTAINS SOILS THAT CONTAIN THE FOLLOWING CHEMICALS: [LIST APPLICABLE TOXIC AIR CONTAMINANT(S)] TO REPORT ANY DUST LEAVING THE SITE PLEASE CALL [FACILITY CONTACT] OR THE SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT AT 1-800-CUT-SMOG"



If soil contaminated earth-moving activity is expected to exceed 50 cubic yards or more stringent quantities as identified in project documents, it is especially important to post notifications prior to activity, maintain signage, implement specific operational activities as needed to control dust, sample air quality, and keep daily records of the dust control methods used.

If neighbors or local businesses complain about air quality or if established thresholds are exceeded, Metro or its contractors could face possible fines, delays in construction, or additional shut-downs.

Case Study – Rock Crushing Activities



CLAX Project: wet suppression system for rock crushing activities.

On the Crenshaw / LAX project, rock crushing activities were required as part of construction operations. In order to minimize fugitive dust from these activities, the Contractor installed water misters, positioned at various areas along the conveyer belts, creating a wet suppression system.

This effort not only reduced the potential for fugitive dust from operations, but is also an example of using in-line portable equipment, supporting the California Air Resources Board requirements described in detail within the GCP MECA module.

Plan appropriately



- > Comply with approved plans and permits
- > Train personnel assigned to the project
- > Have qualified experts on-hand
- > Plan activities carefully



Metro - Southwest Yard



Keys to success in controlling air quality include putting measures in place up front, planning for worker and community health and safety, making sure everyone on the project, including sub-contractors, are aware of processes and procedures, and doing the daily housekeeping that prevents many of the issues we've discussed in this module from occurring.

Contractors and subs are expected to work through project completion to control air pollutants and meet all regulatory requirements in accordance with their approved plans.

If conditions change on the construction site that impact the controls, or the measures are inadequate, the plan must be revised and resubmitted to Metro for approval. The Contractors are responsible for plan implementation, even through any temporary suspension of work. An inability to control fugitive dust to allowable levels during construction can result in work delays, fines, withholding of payment, or removal of an operation.

It is therefore recommended that contractors allow sufficient time and resources to train employees and subcontractors on fugitive dust control, carefully plan activities and allocate resources appropriately to perform all mandatory activities.

Since Contractors have access to innovative technologies and state-of-the-art practices, Metro relies on you to bring innovative ideas and equipment to the project to satisfy regulatory requirements, save money, and avoid construction delays.

Thank you



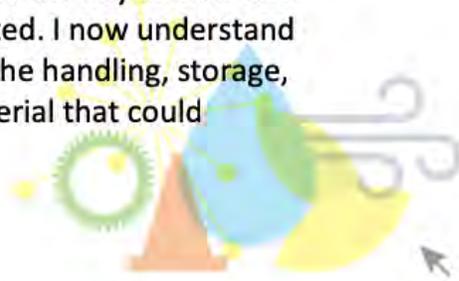
Send your thoughts to:
sustainability@metro.net

Thank you for watching this MECA module. Resources mentioned in this module are available for download from this site.

We also encourage you to share your feedback using the form on this site or send your thoughts to sustainability@metro.net.

Certification

This certifies that I have reviewed the key elements of controlling air quality as presented. I now understand the importance of planning for the handling, storage, movement, and removal of material that could contribute to air quality.



Your Name, Title

Company

Date



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Let us know that you watched and learned from this module. You might want to take a screen shot of this certification and include it in materials you share with Metro.