

Document Number: PWE_CB_AIR 003	FORT CARSON Environmental Management System	Revision Number: 003
Document Title: Fugitive Dust Control Plan		
Approved By: <i>Mark R. Bradbury</i>	Title: Chief, Compliance Branch	Issue Date: 21 June 2004
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**Directorate of Public Works
Environmental Division**

**U.S. Army Garrison
Fort Carson, Colorado 80913**

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<u>INFORMATIONAL LINKS</u>	

[Colorado Air Quality Control Regulation No. 1](#)
[Colorado General Permit \(GP01\)](#)
[Colorado Land Development Application Guidance](#)
[Colorado Land Development Application Form](#)
[El Paso County Air Quality Control FAQ](#)

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SUMMARY OF CHANGES

(Excludes general format changes, error corrections, and omissions)

- 1.) All references to El Paso County Air Quality Regulation and permitting authority have been removed, effective 1/1/2009. An informational link has been added above to reference any frequently asked questions. – 1/10/2011
- 2.) The appendices were re-organized to streamline the document. Any external references that are subject to change have been referred to in the informational links above (i.e. State AQCC regulation No. 1). – 1/10/2011

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EXECUTIVE SUMMARY

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There are a number of technical terms that apply to emissions emitted into the air. However, reduced to laymen’s terms, Fort Carson is required to employ all practical measures to avoid creating visible emissions that are in excess of 20 percent opacity, having any visible emissions go beyond the Installation’s boundaries or creating a nuisance dust problem.

The most common examples of fugitive dust emissions are those associated with storage piles or unpaved roads caused by either wind or human activities, such as vehicle traffic. Construction and demolition sites, paved roadways and disturbed areas are also examples of fugitive dust emission sources.

Many of our fugitive dust sources/activities are required to obtain permits having control measures and operating procedures to minimize emissions and prevent off-property transport. Regardless of whether or not a permit is required, any activity capable of producing fugitive dust is required to use all available and practical methods that are technologically feasible and economically reasonable in order to minimize such emissions. Per the Colorado Air Quality Control Commission’s Regulation No. 1, this control plan will be enforceable and a copy held on file at the state.

The purpose of this plan is to focus on control measures to implement that will minimize fugitive dust emissions and avoid exceeding the threshold levels dictated by the state regulations. This plan has been developed at the request of the Colorado Department of Public Health and Environment (CDPHE).

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SECTION 1 – INTRODUCTION

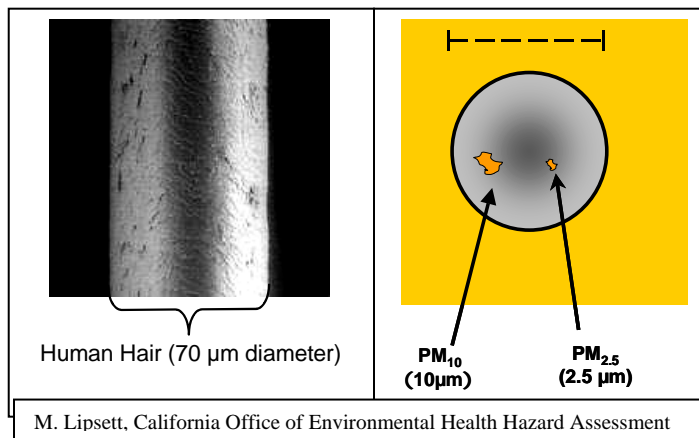
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Purpose

Developed at the request of the CDPHE, this plan describes all of the fugitive dust sources and the technologically feasible and economically reasonable control measures and operating procedures that can be used to minimize dust on Fort Carson. **Our personnel, contractors, and Soldiers will implement these measures to avoid off-property transport and to ensure the associated visible emissions do not exceed 20% opacity or create a nuisance problem.** Additionally, this plan will serve as a planning tool that can be incorporated into project design and construction phases to help reduce fugitive dust emissions on Fort Carson. If there is a dust incident, the CDPHE can give Fort Carson a Notice of Violation by citing that this plan was not followed. This plan is enforceable.

Fugitive Dust and Its Health Effects

Fugitive dust is a health concern because it can contain particles that may be trapped in the nose or upper respiratory system. Other particles can bring about both chronic and acute health effects, such as persistent coughs, asthma, aggravation of bronchitis, premature death, or heart and lung disease. Particularly sensitive groups that appear to be at greater risk include the elderly, individuals with cardiopulmonary disease (such as asthma), and children. In addition to health complications, material in fugitive dust can cause impaired vision, physical discomfort and/or property damage.



References

Control of fugitive dust is regulated by the Colorado Air Quality Control Commission (AQCC) Regulation No. 1.

Fort Carson is regulated by the CDPHE for any activities that create fugitive dust emissions. Certain activities, such as sandblasting and land development projects, may require permits and if so, the permits will contain site-specific fugitive dust control plans. Refer to Colorado Land Development Application Guidance for projects requiring a construction activity/land development permit based on the size or duration of disturbed land. The DPW-ED Air Program Air Quality Assessment Form and Requirements Guide (AQA) also address fugitive dust control. The applicable state and/or county emission limitation guidelines are listed below:

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20% opacity emission limitation guidelines apply to:

- Construction activities clearing an area greater than 5 acres (CDPHE)
- Storage and handling of materials (CDPHE)
- Sandblasting (CDPHE)

No off-property transport emission limitation guidelines apply to:

- Construction activities clearing an area greater than 5 acres (CDPHE)
- Demolition activities (CDPHE)
- Storage and handling of materials (CDPHE)
- Haul trucks and on-site haul roads (CDPHE)

Nuisance emission guidelines apply to:

- Unpaved roadways (CDPHE)
- Activities depositing material on paved roadways (CDPHE)
- Off-site haul roads (CDPHE)

Scope

The most common examples of fugitive dust emissions are those associated with storage piles or unpaved roads caused by either wind or human activities, such as vehicle traffic. Construction, demolition, dismantling, and renovation activities, unpaved roadways, and disturbed areas are other sources of fugitive dust emissions. Importantly, regardless of whether or not a project requires a permit, Fort Carson requires that sources emitting fugitive dust must use applicable control measures to minimize such emissions as much as possible.

This document is a guide for identifying and controlling sources of fugitive dust emissions on Fort Carson. Section 2 defines and describes these fugitive sources, Section 3 describes the appropriate control measures to minimize those emissions, Section 4 outlines responsibilities of involved personnel and Section 5 concludes. For ease of reference, the applicable regulations, as well as other documents are linked in the appendices.

This document is not intended to serve as a state or county guide to permits. For permit requirements or guidance, refer to the regulations or contact the DPW-ED Air Program (526-6601 or -1708).

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SECTION 2 – SOURCE CATEGORIES

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General

This section defines and describes the fugitive dust emissions sources on Fort Carson. Fugitive emissions are those that cannot be reasonably collected and passed through a stack or other type of opening. When they are caused by sporadic or widespread activities due to wind or vehicle travel, it can often be difficult to quantify such emissions. Fort Carson’s annual emissions inventory includes fugitive dust emissions from unpaved roads. However, this is a rough estimate as it is difficult to track the number and types of vehicles on these roads, located mostly downrange from the cantonment area. Additionally, there are no specific emission factors established for the various types of military vehicles or to account for Colorado’s soil conditions.

Source Categories

- Construction/Land Development Activities
- Demolition, Dismantling, and Renovation Activities
- Storage Yards, Storage Piles
- Haul Roads
- Unpaved Road Travel
- Unpaved Road Wind Erosion
- Paved Road Dust Entrainment
- Sandblasting
- Disturbed Areas
- Street Cleaning/Sweeping
- Street Sanding
- Mining Activities

Construction/Land Development Activities

This is a significant windblown fugitive dust category on Fort Carson. This category represents dust generated by soil disturbance due to surface preparation and equipment use. Windy conditions greatly increase emissions from disturbed surfaces. Construction activities include excavations, grading, filling, and other earth moving by mechanical processes that may result in releasing dust into the atmosphere. Projects may include, but are not limited to, constructing gate entrances and buildings, developing parking lots and roads, and excavations of ditches.

Demolition, Dismantling, and Renovation Activities

Demolition activities include the destruction or dismantling of a structure by using mechanical equipment, such as bulldozers, front-end loaders, or cranes. Debris from demolition practices is loaded onto trucks, which can create dust, and transported to an off-post permitted landfill. Projects

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on Fort Carson primarily consist of demolishing unwanted buildings after reusable materials are deconstructed and salvaged and the appropriate surveys and assessments have been made.

Storage Yards/Storage Piles

Temporary or permanent storage yards/piles contain road base material; fill dirt and/or landscaping materials that are used around Fort Carson throughout the year.

The Rocky Mountain Asphalt Yard, LB&B Storage Yard and the Troop Construction Yard are permanent, fenced storage yards on Fort Carson. Also, stockpiles of rock are located just inside Gate 7, off Route 115, which will be the source material for a U.S. Army National Guard’s rock crusher, soon to be located at Fort Carson’s Brown’s Quarry two miles from Gate 7. Once the crusher becomes operational, several smaller rock piles will be placed adjacent to the rock crusher, which will consist of various source material for the crusher, such as clean concrete rubble, the crushed material, and unusable material to be disposed of.

Haul Roads

As defined by the AQCC Regulation No. 1, haul roads are used for commercial, industrial or governmental hauling of materials and are roads that the general public does not have a right to use.

Unpaved Road Travel

Fort Carson has approximately 250 miles and Pinon Canyon Maneuver Site (PCMS) has approximately 100 miles of unpaved roads. Although the cantonment areas do contain some unpaved roads (i.e., tank trails and construction roads), the majority of them exist downrange. Tactical vehicles travel on these downrange unpaved roads to get to and from their training areas, as well non-tactical vehicles travel within the downrange area. Although part of training includes driving and maneuvering under dusty conditions, a chemical dust suppressant is used on the unpaved roads when funds are available.

Unpaved Road Wind Erosion

Wind erosion may occur when the wind at one foot above the ground surface blows greater than 12 mph. It is a serious fugitive problem in Colorado, as the wind physically removes the lighter, less dense soil constituents such as organic matter, clays, and silts.

Paved Road Dust Entrainment

The Fort Carson has approximately 175 miles of paved roads and the PCMS has less than a mile. Dust is generated from this category when mud is tracked out from unpaved roads onto paved roads and then vehicles grind and lift soil off these paved surfaces and into the air. Entrainment also occurs on unpaved shoulders of paved roads from vehicles traveling on the paved road.

Abrasive Blasting

Abrasive blasting outdoors is used to remove paint from streets, curbs, and buildings.

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Disturbed Areas

This can be a significant windblown fugitive dust category due to increased development on Fort Carson. Windy conditions significantly increase emissions from disturbed soils.

Street Cleaning/Sweeping

Mechanical street sweepers are used on a continuous basis on Fort Carson. They clean the debris from paved roadways to maintain the overall appearance of Fort Carson and also as a best management practice for storm water pollution control. However, in dry conditions, the sweeping equipment can create some minor, localized dust emissions.

Street Sanding

This is a seasonal source as sand is applied on icy roads in the wintertime to improve driving conditions and to protect public safety. However, the sand left on the roads can become windblown or be disturbed and ground-up by vehicle traffic, thus contributing relatively small amounts of localized dust emissions.

Mining Activities

Mining activities could occur at Brown's Quarry in the future. Tomahawk mine, near Stone City in Pueblo County on Fort Carson, is mined annually for clay by Robinson Brick Company, which has state-owned mineral rights.

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SECTION 3 – CONTROL MEASURES

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General

Abatement and control measures, such as watering, can be used to minimize dust at several types of sources, while chemical stabilization (subject to available funding (SAF)) may only be suitable for larger size areas and identified significant sources. All available control measures should be evaluated carefully to determine their suitability for controlling emissions. Continuing evaluation of these control measures should be performed together by the Directorate of Public Works (DPW) to determine their applicability and suitability.

The DPW-ED Air Program has developed a document, entitled Air Quality Assessment (AQA) Form and Requirements, as an aid for educating personnel working on Fort Carson about regulations and requirements governing the most common types of dust emission sources. In addition, during their environmental training, Environmental Protection Officers (a position required for each directorate and military unit) are made aware of fugitive dust emissions and what control measures Soldiers must take.

Existing Dust Controls

Prior to the development of this plan, Fort Carson has gone to great lengths and efforts for many years to control and minimize fugitive dust from various source categories. For example, a chemical dust suppressant is routinely applied (SAF) to various types of unpaved roads on Fort Carson and the PCMS depending on their location relative to the Installation boundary, quantity of vehicular traffic, and the types of vehicles using them. As well, each project is reviewed by the DPW-ED and the project proponents and their contractors are made aware of the need for dust controls and any applicable permits. The aforementioned AQA form should help increase that general awareness.

Many activities on Fort Carson are also subject to best management practices under the National Pollutant Discharge Elimination System permitting program for the control of non-point pollution sources and discharges of sediment and contaminants to Fort Carson's storm water system. Projects one acre or more are required to have a Storm Water Pollution Prevention Plan, which includes a section on dust control. The EPA's recommended control measures to minimize water erosion and transportation of sediment off site are similar to numerous controls for minimizing dust. For example, control of track-out onto paved roads, stabilization of site, revegetation, and maintaining the natural topography are control measures used to minimize both dust and sediment transportation.

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Recommended Control Measures

This section identifies the most common, available control measures recommended for implementation, but should not be relied upon as a comprehensive list or the only list. Control measures are often considered best management practices and the DPW-ED does not want to limit opportunities for using such practices if they are not included in the list below. Per Army Regulation 190-5 and Colorado Revised Statute 42-4-1011(1), there is an installation-wide speed limit of 30 mph for paved roads, unless otherwise posted, and 20 mph for unpaved roads.

Construction/Land Development Activities

- Use water for short-term surface stabilization (chemical stabilization maybe necessary)
- Minimize track-out onto paved roads
- Cover materials in the haul trucks
- Wash loaded haul trucks to remove materials from the exterior prior to transporting materials
- Wet the load
- Limit load size
- Stabilize site upon completion of grading (using either chemical, mechanical or vegetation) or when subsequent development is delayed
- Restrict speed limits
- Rapid cleanup of project-related track-out or material spills on paved roads
- Maintain natural topography to the greatest extent possible
- Construct parking lots and paved roads first (where feasible)
- Construct upwind portions of projects first (where feasible)
- Restrict activity during periods of high winds
- Close roads if necessary

Demolition, Dismantling, and Renovation Activities

Control measures shall be used throughout the demolition and cleanup portion of the project, including during loading and transit of materials.

- Wet down, including pre-wetting of work surface
- Use of appropriate containment
- Minimize track-out onto paved roads
- Cover materials in haul trucks
- Wash loaded haul trucks to remove materials from the exterior prior to transporting materials
- Wet the load
- Limit load size
- Rapid cleanup of project-related track-out or material spills on paved roads
- Restrict activity during periods of high winds

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Storage Yards and Storage Piles

- Use of wind breaks
- Restrict traffic flow
- Restrict speed limits
- Provide cover/enclosures
- Apply water or soil binder
- Compaction
- Stabilization
- Use of water
- Limit size of particles to store
- Minimize the slope of the upwind face of the pile, confining as much pile activity as possible to the downwind side of the pile
- Limit the pile height

Haul Roads

- Chemical stabilization- (Note: steep grade terrains limit application of any suppressant.)
- Restrict speed limits
- Restrict traffic flow

Unpaved Roads/Areas

Appendix B consists of installation maps for the unpaved areas that receive the chemical dust suppressant once to twice a year, subject to available funds.

- Use water for short-term surface stabilization
- Alternatively, chemical stabilization is applied on a priority basis for long-term effectiveness, and it may also be required on longer term construction projects when water is no longer cost effective, cannot be used due to water restrictions, or is not effective with the current weather conditions. Priority 1 roads are unpaved roads/areas in the cantonment area that receive traffic; Priority 2 roads are close to border communities; and Priority 3 roads are located mostly at the PCMS or downrange on Fort Carson that pose limited dust impact to surrounding areas.
- Restrict speed limits
- Restrict traffic flow

Unpaved Road Wind Erosion

- Use water for short-term surface stabilization
- Chemical stabilization
- Restrict speed limits

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- Restrict traffic flow
- Reduce wind velocity at the soil surface. This is done with windbreaks, revegetation, and surface roughness.

Paved Road Dust Entrainment

- Minimize track-out onto paved roads
- Cover materials in haul trucks
- Limit load size
- Rapid cleanup of project-related track-out or material spills on paved roads
- Employ street cleaning/sweeping
- Wash or otherwise treating the exterior of the vehicle
- Keep roadway access point free of materials that may be carried onto the roadway
- Restrict speed limits

Abrasive blasting

This is an occasional source on Fort Carson and must be coordinated with the DPW-ED prior to implementing such outdoor projects to ensure that the appropriate sampling and analysis is performed on the paint in case it contains lead. (Abrasive blasting of vehicles is performed at Building 8000 and 8004.)

- Use enclosures with dust collecting equipment
- Use wet blasting methods
- Use non-silica material

Disturbed Areas

- Use water for short-term surface stabilization
- Stabilize site upon completion of grading (using either (chemical, mechanical or vegetation) or when subsequent development is delayed
- Reseed
- Compact disturbed soil
- Use wind breaks
- Use weed suppression techniques, such as mowing weeds or using goats

Street Cleaning/Sweeping

- Use water while equipment is operated
- Clean streets on a regular schedule to avoid build up

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Street Sanding

- Sand streets by priority for public safety
- Thoroughly remove sand as soon as possible after a storm to prevent it from being ground into dust (street cleaning/sweeping)
- Use snowplows to remove snow and ice before sanding
- Adjust and maintain spreaders for efficient application

Mining Activities

- Water or chemical stabilization of unpaved roads
- Prompt removal of rock minerals, soil and other dust-forming debris from paved roads and scraping and compaction of unpaved roads to stabilize road surface
- Restrict speed limits/vehicle travel in and around the mining operation
- Re-vegetation, mulch, or otherwise stabilize the surface of all areas adjoining roads and disturbed lands that are a source of fugitive particulate emissions
- Enclose, cover, water, or otherwise treat loaded haul trucks and railroad cars, or limiting size of load, to minimize loss of material to wind and spillage
- Substitute conveyor systems for haul trucks
- Enclose, cover, stabilize, minimize the slope of the upwind face of the pile, confining as much pile activity as possible to the downwind side of the pile

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SECTION 4 – RESPONSIBILITIES

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Personnel involved in activities that produce fugitive dust emissions will continue to be made aware of applicable local, state and federal regulations by providing them access to this plan, the DPW-ED Air Program website, and receiving DPW-ED Air Program comments on project reviews. Regardless of whether or not a permit is required, sources potentially emitting fugitive dust are required to minimize such emissions so that nuisance conditions are not created, visible emissions are not transported off property, and opacity limits are not exceeded.

The AQA form is available by contacting the Air Program Manager and/or from the DPW-ED Air Program portal and distributed at the quarterly Installation Environmental Protection Officer's (EPO) Course to personnel for educational awareness.

Dust issues are addressed during the EPO training course. In addition, the DPW-ED Air Program will address current particulate matter/dust issues at the Garrison Commanders Environmental Quality Control Committee (EQCC) to raise awareness of dust challenges and consider policy actions. In addition, at the monthly Environmental Protection Officer's meeting general dust issues are addressed relating to: how to monitor dust on sites, actions to take if a non-compliance event occurs, and where to find this plan. DPW-ED efforts to increase education and awareness about dust concerns should minimize the potential for non-compliance issues concerning dust on Fort Carson.

If a fugitive dust event exceeds the 20% opacity limit, results in off-property transport or violates the nuisance regulation, actions will be taken to correct the problem and return to compliance as quickly as possible. Project proponents/contractors are responsible for complying with their specific county/state dust control plans, if a permit is required, as well as the Fugitive Dust Control Plan. If the contractor is not implementing sufficient control measures, then the Contracting Officer Representative must take appropriate future actions, e.g., stop awarding projects to that contractor etc.

The following are steps that have been and will continue to be taken if a fugitive dust event is observed by project proponents/contractors:

- Stop the activity immediately
- Within a reasonable timeframe, notify DPW-ED Air Program by phone (526-6601) and if no one is there, contact the DPW-ED Compliance Branch at 526-8001.
- Proceed with activity in conjunction with DPW-ED guidance.
- Implement more control measures to minimize the fugitive dust non-compliance event.
- Provide DPW-ED Air Program with situational updates.

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The DPW-ED Air Program will take the following steps if a fugitive dust non-compliance event occurs:

- Notify the appropriate project personnel/Contracting Officer Representative
- Verify that the appropriate actions/control measures have been implemented to minimize fugitive dust
- Verbally report incident to CDPHE and local County Health Department within 24 hours of incident and follow up with an email within 48 hours
- Report incident on Fort Carson's Title V Operating Permit Semi-annual/Annual Compliance Report to CDPHE and EPA

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SECTION 5 – CONCLUSION

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This plan should be referred to prior to project initiation to provide additional forethought in the development and implementation of a project to avoid off-property transport and to ensure the associated visible emissions do not exceed 20% opacity or create a nuisance problem. Personnel involved in activities that produce fugitive dust are responsible for implementing the applicable control measures and operating procedures to minimize dust emissions to the greatest extent possible. Such persons are responsible for complying with all applicable county, state and federal air regulations and will appropriately burden the responsibility of any associated compliance actions if taken by the regulatory authorities.

Personnel will continue to be made aware of the local and state regulations through a variety of ways, primarily by being provided access to this plan, as well as the *Fugitive Dust Controls, Permit Requirements and Guidelines* brochure. The DPW-ED Air Program will continue providing appropriate comments when reviewing projects so that personnel will be made aware of fugitive dust issues and requirements for control measures.

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**Appendix A— Air Permitting Requirements For State (CDPHE)
Land Development (LD)/Construction Activities**

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It is not based on project size, but area of land disturbed and time taken to disturb it.

If < 25 acres is disturbed¹ and takes < 6 months, then LD APEN/ construction permit exempt. For example, 22 acres and 5 months are below the acreage and time duration limits, and therefore no state permit is required.

If there is any variance to the above, then submit permit application to CDPHE, who will calculate emissions to see if exceed 2 tons per year (tpy).

Most likely, if > 25 acres and/or > 6 months, the 2 tpy threshold is exceeded and then a LD APEN/ construction permit is required.²

See examples below:

If > 25 acres and > 6 months AND exceeds 2 tpy of uncontrolled PM emissions, then LD APEN/construction permit required. 2

If > 25 acres and < 6 months AND exceeds 2 tpy of uncontrolled PM emissions, then LD APEN/construction permit required. 2

If < 25 acres and > 6 months AND exceeds 2 tpy of uncontrolled PM emissions, then LD APEN/construction permit required. 2

¹ limit = contiguous acreage.

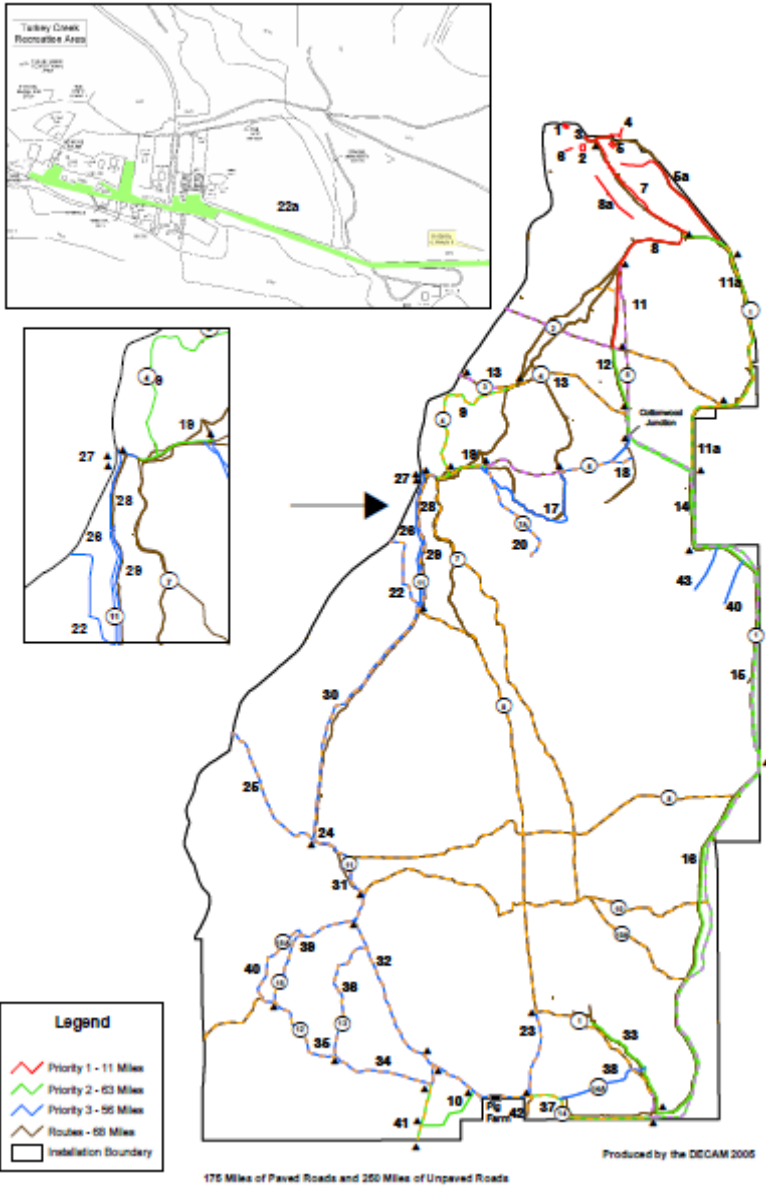
² Complete and submit state permit application so it can calculate emissions. If a permit is required, the state will process and charge for permit processing fees.

Appendix B – Dust Suppression Maps

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FTC

Fort Carson Military Reservation



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