U.S.-Mexico Border 2012 Program
New Mexico-Chihuahua Rural Task Force

Dust Control for Improved Particulate Air Quality in Columbus and Palomas

PM Air Quality and Dust Control Recommendations

Introduction:

In 2007, the U.S.-Mexico Border 2012 Program provided funding to the New Mexico-Chihuahua Rural Task Force (RTF) for addressing particulate matter air quality problems caused by unpaved roads and cleared land in Columbus and Palomas. This project was identified as a priority of the New Mexico-Chihuahua Rural Task Force Air Quality Subcommittee in 2005. The project inventoried paved/unpaved roads and cleared land areas in the sister cities, produced digitized maps of paved/unpaved roads and cleared land, and coordinated a binational technical workshop on dust control methods for reducing particulates from unpaved roads and disturbed land. Based on input of technical workshop presenters and participants and feedback of RTF members, the following dust control recommendations have been identified to mitigate particulate matter air quality issues in Columbus-Palomas.

Background:

In 2005, Rural Task Force participants identified poor air quality as a priority issue to be addressed by the Border 2012 Program in southwestern New Mexico and northwestern Chihuahua. The Air Quality Subcommittee further defined the nature of the air quality issue by identifying particulate matter air pollution as the community's primary concern. "Particulate matter" refers to a mixture of small particles and liquid droplets composed of combustion by-products such as acid nitrates and sulfates, organic chemicals, metals and soil or dust.

According to the U.S. Environmental Protection Agency, not all particles are equal from a public health perspective, since only particles smaller than 10 microns in diameter can enter into the lungs and cause adverse health effects. Smaller fine particles (diameter less than 2.5 microns) can penetrate even deeper into the lungs. Exposure to coarse and fine particles has been linked to increased respiratory symptoms such as difficulty breathing or coughing, decreased lung function, aggravation of asthma, development of chronic bronchitis, nonfatal heart attacks, and premature death in people with heart or lung disease.[1]

Primary sources of particulate matter emissions identified by the subcommittee include both combustion and fugitive dust sources:

- windblown dust from unpaved roads and cleared land
- open burning of trash
- improper burning of medical waste
- tire burning and tire fires

No routine air quality monitoring is conducted in Columbus-Palomas. Without air quality monitoring data, it is difficult to understand the nature and extent of the air quality problem and potential sources of

[1] www.epa.gov/oar/particlepollution/health.html

pollutants. Establishing an air quality monitoring network was considered a high priority for the Air Quality Subcommittee.

In response to the Rural Task Force's air quality concerns, a year-long particulate matter air quality monitoring study was conducted by the Southwest Consortium for Environmental Research and Policy (SCERP) in 2005-2006. The project was carried out in partnership with the New Mexico Environment Department, New Mexico Office of Border Health and SEMARNAT. Monitoring every 1-in-6 days, the study measured consistently high concentrations of PM10 (41 days above the EPA 24-hour PM10 National Ambient Air Quality Standard) at the Jardin de los Niños kindergarten in Palomas. There were 13 days in which air quality was considered "hazardous" according to EPA's Air Quality Index and six days in which air quality was within the "very unhealthy" range. In Columbus, there was one exceedance of the PM10 standard (unhealthy for sensitive groups) at Pancho Villa State Park during the study period. Table 1 summarizes PM10 air quality monitoring results and the health messages associated with ambient concentrations. Limited chemical analysis of PM10 filters showed that the samples may be predominantly composed of crustal material indicating dust from unpaved roads and disturbed land as possible sources.

PM2.5 monitoring was conducted only during November 2005 – January 2006. Fourteen exceedances of the 24-hour PM2.5 standard occurred at the Columbus-Palomas Port of Entry. No chemical speciation was conducted specifically for the fine fraction. Table 2 summarizes PM2.5 air quality monitoring results and the health messages associated with ambient concentrations.

These monitoring results clearly indicate a serious environmental health issue that needs to be addressed. Approaches to mitigating the PM air quality problem are outlined in this report.

Table 1. Number of Days vs. PM10 Air Quality Index Value (Monitored 1-in-6 Days August 2005 – August 2006)

# of Days Columbus (Pancho Villa State Park)	# of Days Palomas (Jardin de los Niños)	Air Quality Index	Health Message
38	5	0 – 50 Good	None
8	3	51 – 100 Moderate	Unusually sensitive people should consider reducing prolonged or heavy exertion.
1	13	101 - 150 Unhealthy for Sensitive Groups	People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion.
0	9	151 - 200 Unhealthy	People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion.
0	6	201 - 300 Very Unhealthy (Alert)	People with heart or lung disease, older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion.
0	13 (includes 5 values above 600)	>300 Hazardous	Health warnings of emergency conditions. The entire population is more likely to be affected.

Air quality data from SCERP-funded "Characterization of PM in Columbus-Puerto Palomas, Project Number A-05-11, Larry K. Olsen, New Mexico State University

Air quality data analyzed using AIRNow AQI calculator at: http://www.airnow.gov/index.cfm?action=static.publications

Table 2. Number of Days vs. PM2.5 Air Quality Index Value Monitored at Columbus-Palomas Port of Entry (November 2005 – January 2006)

# of Days	Air Quality Index	Health Message
37	0 – 50 Good	None
16	51 – 100 Moderate	Unusually sensitive people should consider reducing prolonged or heavy exertion.
7	101 - 150 Unhealthy for Sensitive Groups	People with heart or lung disease, older adults, and children should reduce prolonged or heavy exertion.
7	151 - 200 Unhealthy	People with heart or lung disease, older adults, and children should avoid prolonged or heavy exertion. Everyone else should reduce prolonged or heavy exertion.
0	201 - 300 Very Unhealthy (Alert)	People with heart or lung disease, older adults, and children should avoid all physical activity outdoors. Everyone else should avoid prolonged or heavy exertion.

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Rural Task Force Dust Control Project

In 2007, the U.S.-Mexico Border 2012 Program provided funding to the New Mexico-Chihuahua Rural Task Force for addressing particulate matter air quality problems caused by unpaved roads and cleared land in Columbus and Palomas.

New Mexico State University and Universidad Autonoma de Cd. Juarez conducted a GIS-based paved/unpaved road and cleared land inventory as part of this current project. Summarized in Table 3, results demonstrated approximately 91% of the roads in Palomas are unpaved and about 84% of the roads in Columbus are unpaved. Cleared land areas within the Columbus environs total 4150 acres. Approximately 370 acres of cleared land areas adjacent to Highway 11 and Highway 180 in Luna County produce high levels of particulate matter, contributing to visibility problems that force highway closures. See Appendix 1 for GIS maps.

Table 3. Results of GIS Paved/Unpaved Road and Cleared Land Inventory

Sister City	Paved/Unpaved Road Statistics	Cleared Land
Columbus	Total roads – 87 miles – 140 km Unpaved roads – 73 miles (84%) – 117.5 km Paved roads – 14 miles (16%) – 22.5 km	4150 acres in Village limits (1679 hectares)
Palomas	Total roads – 68.5 km – 42.6 miles Unpaved roads 62.2 km (91%) – 38.7 miles Paved roads – 6.3 km (9%) – 3.9 miles	Cattle corral – 6.4 hectares (15.8 acres) Cleared land within Palomas city limits – 29.5 hectares (72.9 acres)

In December 2008, the Rural Task Force convened a technical workshop to discuss various dust control mitigation measures specific for known emission sources in the Columbus-Palomas area. Technical presentations included PM abatement from agricultural sources, road paving in New Mexico, Luna County's Natural Events Action Plan, and road paving projects in Mexico funded by the Border Environment Cooperation Commission.

Follow-up actions related to the Columbus-Palomas PM air quality problem were outlined by the technical workshop participants:

- Continued ambient monitoring
    - E-BAM monitors – move monitors from Sunland Park/Anapra to Columbus-Palomas once that work is complete – NMED
    - Need a weather station to get accurate meteorological data to help analyze air quality monitoring data
    - Rural Task Force to write formal letter to EPA and SEMARNAT requesting assistance with ambient monitoring
- GIS work on paved/unpaved roads and cleared land
    - Complete NMSU GIS work for Columbus

    - Update UACJ paved roads on map to reflect Palomas paving
    - Include health data in GIS map
- Health Effects of PM
    - Correlate monitoring data with health data
    - Need education on PM health effects
- Collaboration with the New Mexico Department of Health/Office of Border Health on a regional assessment of land-based sources of air quality contaminants
- Dust control projects
    - Road Paving Plan for Palomas/Ascension
    - Follow-up on hydrology study to make sure that the design will control flooding effectively. This is leading to dust problems in Palomas
    - Road paving in Columbus
    - Agricultural sector projects
        - Educational
        - Technical exchanges
        - Reforestation of the berm around Palomas
        - Windbreaks at corrals, other areas
        - Manure removal
        - Need to solicit project ideas from the Asociación Ganadera
        - Moving cattle corral facility – consider at RTF annual meeting
        - NEAP enforcement in Luna County

PM Air Quality and Dust Control Recommendations:

Continued ambient monitoring

Because it could take two years or more before New Mexico Environment Department E-BAM monitors from Sunland Park-Anapra are available for use in Columbus and Palomas, the Rural Task Force has requested technical assistance from the Border 2012 Air Policy Forum with PM air monitoring. Although Columbus and Palomas are working to pave roads in their communities, it will take many years before these infrastructure projects are complete and air quality improvements can be fully achieved. In the meantime, the RTF believes that it is necessary to establish a permanent air quality monitoring network along with a meteorological station in the sister cities to assist in the following:

- Community notification of presence of high PM concentrations that pose a public health risk and outreach on how to minimize risk of exposure;
- More detailed evaluation of the air quality problem in Columbus-Palomas, ways to reduce emissions, and possible relationship to respiratory health effects;
- Documentation of air quality improvements achieved by dust control projects under Border 2012 and other programs.

Recommendation: The RTF hopes that this issue can be addressed at the next meeting of the Air Policy Forum and a course of action scoped out. Air quality monitoring in conjunction with community notification and education on how to minimize exposure to PM should be considered as part of this effort.

GIS Inventories of paved/unpaved roads and cleared land

The paved/unpaved road and cleared land data sets were completed and maps created. These data layers will be available on the New Mexico-Chihuahua Border 2012 site at: http://border.nmsu.edu/border_maps.html

Available health data has been identified through the New Mexico Environmental Health Tracking System at http://nmtracking.unm.edu/ .

Recommendation: The RTF should incorporate available environmental health tracking data into its GIS maps as part of future work.

Health Effects of PM

Exposure to PM10 and PM2.5 can lead to a variety of serious health problems. According to EPA, people with heart or lung diseases and older adults are more at risk of hospital and emergency room visits or, in some cases, even death. These effects have been associated with short-term exposures lasting 24 hours or less. Long-term exposures of a year or more have been linked to the development of lung diseases, such as chronic bronchitis. Particles can aggravate heart diseases such as congestive heart failure and coronary artery disease. Particles have also been associated with cardiac arrhythmias and heart attacks. Particles can aggravate lung diseases such as asthma and bronchitis, causing increased medication use and doctor visits. Respiratory symptoms include coughing, phlegm, chest discomfort, wheezing and shortness of breath. Particles can also increase susceptibility to respiratory infections.[2]

Given the poor PM air quality experienced in Columbus-Palomas, participants in the Dust Control Technical Workshop identified a number of follow-up priorities in the area of PM health effects including: continuing efforts to correlate PM air quality monitoring data with health data, and education on PM health effects.

The RTF has supported additional SCERP research proposals for studying the relationship between PM air quality and respiratory health effects in Columbus-Palomas. To date, these proposals have not been funded.

Recommendation: The RTF should coordinate with NMED on education on PM health effects as it pertains to elements contained in the Luna County Natural Events Action Plan (see below). The 5-year review of the Luna County NEAP may reveal some educational priorities with which the RTF can assist.

NM Department of Health/Office of Border Health Regional Assessment of Land-based Sources of Air Quality Contaminants

The New Mexico Office of Border health has obtained funding to carry out a series of interconnected studies to develop a better understanding of the sources of air quality contaminants, both natural and human-induced, and the climatological phenomena that control them for air quality problems in southwestern and south-central New Mexico. The study will also create a new epidemiological baseline

[2] EPA's AIRNow website -- http://www.airnow.gov/index.cfm?action=static.aqguidepart

of chronic health conditions in the region that will permit an assessment of air pollution-induced health effects.

Recommendation: The RTF should coordinate with the OBH on its regional PM assessment to identify areas in which the RTF can assist in the study and leverage resources among related efforts.

Dust Control from Unpaved Roads in Columbus and Palomas

Dust from unpaved roads is a significant source of particulate matter in Columbus-Palomas. The GIS inventory of paved and unpaved roads conducted as part of this project demonstrated that 91% of the roads in Palomas and 84% of the roads in Columbus are unpaved. In addition to causing respiratory health effects and impairing visibility on roadways, dust can cause increased wear and tear on vehicles and machinery, impact the growth of crops, and dirty residential and commercial buildings.

Options for dust control from unpaved roads range from proper maintenance of the unpaved road, control of vehicle speed, and application of dust suppressants to road paving. Dust control of 38.7 miles of unpaved roads in Palomas would improve the environmental health of 5700 inhabitants of the community (INEGI, 2005 census). Dust control of 73 miles of unpaved roads in Columbus would benefit its 1800 residents (US Census, 2000).

Dust Suppressants

Low traffic volume on many rural roads may not warrant the cost of road paving, thus dust suppressants have been widely used in the US, Canada and Australia as a cost-effective measure for control of particulates from unpaved roads. Dust suppressants are also considered a Best Available Control Measure in the Luna County Natural Event Action Plan. However, significant environmental impacts can result from the use of dust suppressants. In 2002, EPA convened a panel of experts to discuss this issue and to develop a set of recommendations to prevent "another Times Beach" from occurring, referring to the Superfund site that resulted from the use of dioxin-contaminated waste oil as a dust suppressant. The panel reports many problems with the use of dust suppressants, such as no federal regulations cover the manufacture and application of dust suppressants; the chemical composition of many dust suppressants is not known; application of dust suppressants can lead to off-site transport of the material and unintended environmental consequences, such as surface and groundwater contamination and adverse impacts to soil, plants and animals.[3]

Because the soil surface chemistry, moisture content, and shapes of dust particles can affect the ability of different suppressants to adhere to the particles, the EPA expert panel suggests that field testing be conducted to assist in selection of the proper dust suppressant. EPA's Environmental Technology Verification Program has tested five dust suppressants for performance verification. This resource can be used to evaluate effectiveness and potential environmental toxicity of dust suppressants.[4]

Cheaper salt-based products (e.g. magnesium chloride) are considered ineffective in this region given the low relative humidity. A different product, acrylic-polymer-based Soil Sement, is used in Arizona and California on unpaved roads, unpaved parking lots and construction sites. Assuming a 28 foot-wide

[3] Potential Environmental Impacts of Dust Suppressants: "Avoiding Another Times Beach" An Expert Panel Summary Las Vegas, Nevada May 30 – 31, 2002 http://www.epa.gov/esd/cmb/pdf/dust.pdf
[4] Environmental Technology Verification Program, Verified Technologies - http://www.epa.gov/nrmrl/std/etv/vt-apc.html#dsssp

roadway, the cost of the initial application of Soil Sement is $13,500/mile.[5] Typically, maintenance applications are conducted every 8 – 12 months thereafter for approximately $4500/mile. For Palomas, an initial dust suppressant application of all unpaved roads (62.2km= 38.7 miles) would cost $522,450 with an annual maintenance application cost of $174,150. For Columbus, an initial application of Soil Sement to 73 miles of roadway would cost $985,500 million with an annual maintenance application cost of $328,500. Compared to chip sealing, dust suppressants may not be more cost-effective, especially given the annual maintenance costs.

Recommendation: Dust suppressants may be appropriate for some roads in Columbus-Palomas that have low traffic volume and when funding is limited, however, additional field testing and study is recommended to select a suppressant that is appropriate for Columbus-Palomas and that is protective of the environment. Dust suppressants could be analyzed as an alternative to road paving in a technical evaluation conducted by BECC for road paving projects (see below).

Road Paving

The Municipio of Ascensión has developed a road paving plan, which includes roads for paving in Palomas. In 2008, portions of three Palomas streets located along the border to the west of the Port of Entry were paved for a total cost of $1.9 million pesos.[6] The streets included Internacional from the Aduana office west to the cattle facility. Other streets included Juventino Rosas between Internacional and Zaragoza and Zaragoza between Juventino Rosas and 18 de Marzo. Given that Internacional is the major thoroughfare from the Port of Entry connecting the Aduana, Junta Rural de Agua y Saneamiento, the Primary School and the cattle facility, this paving project should improve localized air quality in the area. The extent of the improvement is unknown given the lack of traffic count data for that roadway.

Road paving in Palomas, 2008.
Courtesy Municipio de Ascensión

At the present moment, Columbus is putting more priority on water/wastewater infrastructure for its capital improvements. Road paving projects cannot be conducted until completion in 2009 of the NM Department of Transportation drainage study. Any road paving could be impaired by another flood similar to what occurred during the summer of 2006. Until drainage problems are fixed, the Village will focus on applying base course crusher fines on main dirt roads to the south and east of Columbus to repair flood-damaged roadways.

Pancho Villa State Park has also planned for road paving within the park limits to control for dust. These capitol improvements are being considered as part of the NM State Parks budgeting process.

As discussed at the technical workshop, roadways for paving should be prioritized based on traffic volume. Access roads to schools and other heavily used public areas and access roads to subdivisions are generally considered high-traffic roadways. This project was unable to collect sufficient traffic count

[5] Personal communication with EarthCare Consultants LLC www.dustdr.com, 888-792-4001
[6] Presidencia del Municipio de Ascensión - http://www.ascencion.gob.mx/Contenido/plantilla5.asp?cve_canal=4755&Portal=ascension

data for use in this prioritization process. Traffic count data should be collected to calculate the Average Daily Traffic (ADT) for each road. The ADT can be used as the indicator to prioritize roads for paving.

According to the NM Department of Transportation District I Office, options for cost-effective road paving include chip sealing ($7,000 - $10,000 per lane mile), Cutler repaving ($35,000 - $45,000 per lane mile), and Brazier method ($45,000 - $55,000 per lane mile-excludes base course cost). A review of Border Environment Cooperation Commission (BECC) and North American Development Bank (NADBank)-funded road paving projects in Mexico shows that costs vary widely based on width of road constructed and other factors. See table 4 for costs of selected road paving projects.

Table 4. Costs for Selected BECC/NADB-Funded Road Paving Projects (www.cocef.org)

Location of Paving Project (year)	Description	Cost
Nogales, Sonora (2004)	2,000,000 m^2 by 8 m wide 250 Km	Total = US$9.73 M US$39,000/km
Puerto Peñasco, Sonora (2006)	229,000m^2 by 14 m wide 16 Km	Total = US$4.54 M US$281,250/Km
Naco, Sonora (2007)	3.46 miles by 40 ft wide (5.6 km by 12 m wide)	Total = US$1 M US$178,571/km
Baja California Air Quality (2003) Tecate, Tijuana, Mexicali	222 km by 8 m wide	Total = US$42.5M US$191,236/km

Cost Estimation of Road Paving in Columbus-Palomas and Financing Considerations

The GIS paved/unpaved road inventory estimated that 73 miles of unpaved roadways exist in Columbus. A rough estimate of total cost of road paving in Columbus can be calculated by applying the cost/lane-mile of road paved from NM DOT estimates. The cost could range from $1.02 million – $1.46 million for chip sealing; $5.11million - $6.57 million for Cutler repaving; and $6.57 million to $8.03 million for Brazier method. Sidewalks and guttering can add an additional $1 - $2 million to the cost of the project.[7]

The GIS paved/unpaved road inventory estimated that 62.2 km of roadway are unpaved in Palomas. Although project costs are dependent upon the local costs of materials and labor and financing among other factors, a rough estimate of total cost of road paving in Palomas can be calculated by applying the range of cost/km from BECC-certified projects (Table 4) to the amount of roadway needing paving in Palomas. The cost could range from US$2.4 million (8 m wide) to US$17.5 million (14 m wide).

[7] Personal communication, Paul Nimick, Village of Columbus.

Given the significant cost of road paving, financing is a critical element for any paving project. The BECC process is the principal vehicle for funding road paving projects in Mexico. BECC and NAD Bank funding is contingent upon the ability of the community to pay its share of the project cost. A financial analysis is conducted and based upon its results, a financial structure and capital investment plan is developed. Typically, project costs are shared between the municipality and state. NAD Bank can provide low-interest loans to capitalize the project.

In New Mexico, a number of grant programs are available for road paving projects. The Local Government Road Fund provides state funding up to 75% and requires a 25% local match. State Legislative Appropriations through severance tax funds and general appropriations are also available, although in tough budget years such as 2009, these funds are severely limited. Federally-funded Surface Transportation Program provides resources to rural areas with a population 5,000 and below. Federal Community Development Block Grants are available for road paving and other municipal infrastructure projects. In the short-term, funding will be available for "shovel-ready" projects as part of the federal Economic Stimulus Package. Communities are in the process of submitting projects that can be completed within the short time frames of the stimulus funding.

Technical workshop participants also raised the idea of Columbus working with Palomas to develop a single, binational road paving project to pave streets in both communities. More research would be needed to determine the technical, legal, and financial feasibility of such an approach and if any economies of scale can be achieved by working together on a joint paving project.

Recommendation: Road paving is the most effective option for reducing particulate matter from unpaved roads. It is recommended that Palomas submit a project application form to the BECC to determine eligibility for BECC and NADBank funding. Once drainage issues have been worked out in Columbus, the Village can submit its road paving priorities to a range of federal and state grant programs that fund local infrastructure projects.

Agricultural sector projects

As discussed at the Dust Control Technical Workshop, there are a few agricultural sector PM emission sources that appear to be contributing to particulate matter air quality problems in Columbus-Palomas and the region as a whole. In the immediate vicinity of central Palomas, a cattle export facility located on Avenida Internacional to the west of the Port of Entry has drawn complaints from community members related to windblown dust and fecal matter, odor, flies and rodents, and noise. Some agricultural fields in the region, both in production and fallow, and ranch lands cause visibility problems on windy days and sometimes force highway closures. An emissions inventory would need to be conducted to gain a better sense of the relative contribution of these agricultural sector sources to ambient PM concentrations. Staff from the US Department of Agriculture Natural Resources Conservation Service has offered technical assistance to the RTF to conduct an inventory of PM emissions from agricultural sources, as well as educational assistance in the form of workshops and technical exchanges.

Recommendation: The RTF should work with NRCS and stakeholders to develop a PM emissions inventory of agricultural sector PM sources.

Palomas Cattle Export Facility

The Palomas Cattle Export Facility comprises 15.8 acres (6.4 hectares) located directly on the border approximately 0.3 mi (500 m) to the west of the Columbus-Palomas Port of Entry (see maps in

Appendix 1) on Avenida Internacional. It is managed by the Union Ganadera Regional de Chihuahua/Unidad Sanitaria Palomas. In 2008, 32,738 head of cattle valued at US $15.4 million were processed through this facility.[8] Luna County owns and manages the facility on the U.S. side of the border fence.


Palomas Cattle Facility, November 2008

In 2008, the Border 2012 Rural Task Force and SEMARNAT-Chihuahua received a letter from the Technical Education Council of Palomas requesting both entities intervene to relocate the cattle corrals to mitigate the health impacts of the facility given its location next to a residential area and also upwind of the Ramon Espinoza Villanueva e Ignacio Zaragoza primary school (see Appendix 2 for copy of letter). The letter outlines the concerns of citizens with the environmental impacts of the cattle facility, including odors from manure and insecticides; windblown dust that is thought to cause a high incidence of conjunctivitis at the primary school; and a breeding ground for flies, rats and mice. The letter also mentions that because there is not an established road to bring in the cattle, the truck trailers damage telephone lines, pavement and drainage in the neighborhood and cause excessive noise.

Staff from the Union Ganadera Regional de Chihuahua/Unidad Sanitaria Palomas were unable to participate in the Dust Control Technical Workshop in December 2008 to discuss this issue. They have, however, expressed their willingness to collaborate on projects to mitigate dust and other nuisances from the facility. The RTF will continue to reach out to the Union Ganadera to encourage its participation in resolving this issue.

The Rural Task Force decided at its annual meeting to pursue a Presidential permit from the US State Department to move the cattle facility to the east (down wind) of Palomas. A Presidential permit is required for construction and maintenance of facilities connecting the US with a foreign country. To issue a permit, the State Department must find that the border crossing facility would serve the national interest and that it is in compliance with other applicable laws, such as the National Environmental Policy Act. The Presidential permit application includes information on the applicant; a detailed description of the proposed facility; an explanation of how the national interest is served; a map that identifies similar facilities in the area; traffic information; construction plan; financing; how the applicant will secure the approval of local, state and federal officials in Mexico; approvals from applicable US federal, state and local agencies; historic preservation issues; environmental justice issues; and environmental review.[9]

Navigating through the Presidential Permit process can take years and thus it is critical that the environmental health of Palomas residents is protected in the short term. Working through the New Mexico Border Authority, the RTF has informally notified the US State Department of this issue, however, there is a need to determine how to mitigate dust and other environmental impacts from the cattle facility. As discussed by NRCS at the technical workshop, the agency has developed an air quality assessment tool to assist in identification of air quality concerns and to assess how to address that concern (See Appendix 3). This tool can be used to identify the possibilities for mitigating dust and reducing or eliminating odors from the corral facility.

[8] New Mexico Border Authority
[9] http://www.state.gov/p/wha/rls/fs/2008/110976.htm

The following alternatives can be considered for the **parking, unloading** areas of the corral facility:

- Synthetic/organic dust suppressants
- Mulches such as hulls or wood chips
- Paving or gravel of surfaces

The following wind erosion control practices can be considered for **PM generated and transported by wind:**

- Windbreaks
- Vegetative barriers

Corral dust control, such as frequent manure scraping and manure transfer, are recommended. Covering of manure storage is also recommended.

Practices or techniques suggested for reducing or eliminating **generation of odors** include:

- Manure management
- Control of manure moisture
- Feed management
- Composting

Recommendation: In the short term, the RTF should work with the Union Ganadera Regional de Chihuahua/Unidad Sanitaria Palomas, the NRCS and other stakeholders to identify and develop plans for mitigation of dust and odors from the cattle facility. For the long-term, the RTF should work with the Union Ganadera Regional de Chihuahua/Unidad Sanitaria Palomas, Luna County and other stakeholders to facilitate moving the corral facility down wind of Palomas through the Presidential permit process.

Cleared Land Areas

Cleared, disturbed land areas, such as fallow fields, degraded rangeland and cleared agricultural fields, also contribute to windblown dust in the local Columbus-Palomas area and across the southwestern New Mexico-northwestern Chihuahua region. There are also non-agricultural sector disturbed land areas, such as vacant lots and non-vegetated school yards and playgrounds that may also be sources of windblown dust. According to the GIS inventory conducted by NMSU and UACJ, there are 4150 acres (1679 hectares) in the Columbus Village limits and 72.9 acres (29.5 hectares) in the Palomas city limits that were identified as “disturbed land.”

There are also two areas in Luna County totaling 372 acres that are located along state highways 180 and 11 that have been identified as problematic given the visibility impacts of wind erosion from these properties. One area is a farm with fields that were cleared in 2008, but for a number of reasons, planting was not able to be done. When the cleared fields were not planted and irrigated, severe wind erosion occurred that forced closure of Highway 11 on a few occasions. Although monsoon rains helped weeds and other plants to grow, the area is still seriously degraded.

A second area, located on Highway 180 to the north of Deming is a cattle stock area that became severely impacted by the region’s long-term drought. Lack of vegetation on this land and at times the presence of cattle have contributed to significant wind erosion and visibility impacts to the state highway.

The RTF is collaborating with the NRCS Deming Office to provide an educational workshop for agricultural producers in the RTF region in April 2009. The workshop will cover methods to sustain soil conditions that will help conserve water and prevent wind erosion, such as cover crops and mulching. The NRCS is sponsoring the workshop and the RTF will provide simultaneous translation and coordinate participation by Mexican agricultural producers.

Revegetation of some of the most critical disturbed land areas is a possibility for mitigating windblown dust. The RTF is working with Silver City-based Restoration Technologies LLC and the NRCS Deming Office to explore the possibility of using an engineered erosion control material made from waste biomass (Zerosion) to revegetate degraded land such as barren rangeland, fallow agricultural fields, gas pipelines and vacant lots. Produced from forest restoration projects in the Gila National Forest near Silver City, the waste biomass is applied on top of the reseeded area and acts as a mulch to hold soil moisture and prevent soil erosion. This innovative erosion control product and application system addresses difficult-to-manage landscapes in a way that promotes rural development and provides end uses for low/no-value woody biomass. The groups are examining the possibility of using Economic Stimulus Package funding through the US Forest Service to demonstrate the effectiveness of Zerosion at revegetating a range of degraded land areas that contribute to windblown dust in the RTF region.

Revegetation and use of organic mulches are considered Best Available Control Measures in the Luna County Natural Events Action Plan (NEAP). Agricultural sources are exempt from the NEAP and therefore voluntary participation in any revegetation project will be encouraged.

Recommendation: The RTF should continue to collaborate with the NRCS, producers and land managers to develop and implement proposals to mitigate windblown dust from agricultural and non-agricultural lands.

Natural Events Action Plan (NEAP) Review and Enforcement in Luna County

Air quality monitoring in Deming revealed that PM10 concentrations reached unhealthy levels on three occasions in Luna County in 2003. These exceedances of the 24-hour PM10 standard were analyzed and considered caused by dust storms. As a result of these exceedances, EPA required the New Mexico Environment Department (NMED) to put in place a Natural Event Action Plan (NEAP) for Luna County as an alternative to federally-imposed requirements that may be unnecessarily restrictive on the local area given that the air quality problems were caused by natural forces and by non-industrial sources.

Finalized in October of 2004, the Luna County NEAP outlines the actions to be taken by the NMED and Luna County to protect public health from future elevated PM10 concentrations caused by high wind events. Elements include: 1) public education programs; 2) minimize public exposure to high concentrations of PM10 due to future natural events through public education and awareness campaigns; 3) abate or minimize appropriate contributing controllable sources of PM10; 4) identify, study and implement practical mitigating measures as necessary; 5) periodically reevaluate the NEAP.

Participants in the Dust Control Technical Workshop identified problems with NEAP enforcement as an issue. Most importantly, there are no funds available at the local level to enforce Best Available Control Measures and Reasonably Available Control Measures as required by the Luna County dust ordinance. The first 5-year review of the NEAP will take place in 2009 and it is expected that a more detailed evaluation of NEAP implementation will indicate how to improve its effectiveness.

Recommendation: The RTF should provide comment to the 5-year review of the NEAP and work with the NMED to determine ways in which it might assist to improve the effectiveness of the NEAP.

Other action items

The RTF should review the Columbus hydrology study being conducted by NM Department of Transportation to make sure that the design will control flooding effectively. Sediments brought in from flooding is leading to dust problems in Palomas.

Conclusion:

A year-long special PM monitoring study demonstrated the severity of the PM air quality problem in Columbus-Palomas. Windblown dust from unpaved roads and cleared land areas appear to be significant PM emission sources. Unpaved roads account for 91% of roadways in Palomas and 84% of roadways in Columbus. The RTF should continue to pursue permanent PM air quality monitoring in the sister-city pair in order to track air quality improvements and allow for community notification of high particulate concentrations when they occur. The RTF should also continue to facilitate implementation of a range of dust control projects to achieve air quality improvements to benefit the environmental health of the Columbus-Palomas community.