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Transboundary Air Quality: Problems and Prospects from El Paso to Brownsville

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Along the Texas portion of the United States–Mexico border, air quality problems are located at both ends—El Paso on the west and Brownsville on the east—as well as the center—Eagle Pass. The remaining portions of the border are devoted to ranching or recreation and pose few problems to air quality.

The Environmental Protection Agency rates El Paso second only to Houston in having air quality problems in Texas. The problems persist in El Paso due to the topographic situation. El Paso, as its name implies, is located in a pass. The city is built around the southern end of the Franklin Mountains and goes northward along both the east and west flanks of the range. The mountains rise to 2,134 meters, with the valley between them measuring 1,600 to 4,800 meters in width. The city is located on the northern bank of the Rio Grande and Ciudad Juarez, Chihuahua is on the southern bank. Downtown El Paso is approximately 1,113 meters in elevation; no building is allowed above the 1,219 meter mark on the mountains. The climate is arid and temperature inversions are common. Any pollution put into the air during an inversion period will remain until the inversion breaks. Fortunately inversions, while common during the colder months, seldom last longer than 12–16 hours (Table 1).

One area in the city of El Paso has been designated as nonattainment for carbon monoxide and five areas as nonattainment for suspended particulates. El Paso County has been declared as nonattainment for ozone. There are 133 industrial sources in the west Texas border area that have the potential for polluting the air. Most of these sources are in El Paso County. Major efforts have been made to bring cotton gins and a nonferrous smelter in the region into compliance with air quality standards.[1]

A vexing problem is the high levels of lead in particular and heavy metals in general in the ambient air (Tables 2, 3, 4). The problem was first identified in 1972. Children on both sides of the border had unac-

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1. STEWART, BIENNIAL REP., September 1, 1978–August 1, 1980, 67. (Texas Air Control Board, 1980).

TABLE 1

PERCENT FREQUENCY OF INVERSIONS AND/OR ISOTHERMAL LAYERS BASED BELOW 152.4 METERS (500 FEET) EL PASO, TEXAS

Season	*05:00**	*08:00+*	*17:00**	*20:00+*
Winter	84	91	3	71
Spring	67	33	2	45
Summer	61	11	1	34
Fall	69	55	4	76

*Averages from June, 1957 to May, 1959

+ Averages from June, 1955 to May, 1957

All times are Mountain Standard

Adapted from: G. Hudson, "Air Pollution in El Paso, Texas, 1969" (Unpublished manuscript), at 147.

ceptable levels of lead in their blood.[2] A local non-ferrous smelter instituted a $60,000,000 plant modification program to bring their emissions into compliance with the law. In spite of this program and the growing use of non-leaded gasoline, ambient levels of lead have remained remarkedly constant. This is perhaps analogous to the situation in Los Angeles where reduced use of cars and increased use of non-leaded gasoline have failed to halt the buildup of smog.[3] Officials in both regions are puzzled by the lack of progress in cleaning the air.

Eagle Pass, located in the central portion of the Texas–Coahuila border, has been declared a nonattainment area in suspended particulates. There are few industrial sources of pollution potential within this area.[4]

The Brownsville–San Benito–Harlingen area is one of the most rapidly growing regions in the state. A sub-tropical climate makes the area one of the most intensely farmed in the United States. Many of the emission sources are agricultural processes or related industry. Four areas in the Lower Valley of the Rio Grande—Brownsville, San Benito, McAllen, and Progreso—have been classed as nonattainment for suspended particulates.[5]

2. Londrigan, Gehlbach, Rosenblum, Shoults, Candelaria, Barthel, Liddle, Sunrek, Staehling, and Sanders, *Epidemic Lead Absorption Near an Ore Smelter,* 292 NEW ENGLAND J. MED. 123–29 (1975); Ordonez, Romera, Mora, *Investigacion Epidemiologica Sobre Niveles de Plomo en la Publacion Infantil y en al Medio Ambiente Domiciliario de Ciudad Juarez, Chichua en Relacion con una Fundicion de El Paso, Texas,* 80 BOLETIN DE LA OFICINA SANTARIA PANAMERICAN 303–17 (1976).

3. Blakeslee, *Reduced Use of Cars Fails to Halt Buildup of SMOG,* Los Angeles Times, May 9, 1979.

4. Stewart, *supra* note 1, at 3.

5. *Id.*, at 22.

TABLE 2

SITES HAVING AMBIENT LEAD LEVELS EQUAL TO OR GREATER THAN 1.5 $\mu g/m^3$

Site	*Quarters Tested*	*Quarters equal to or greater than 1.5 $\mu g/m^3$*
1	30	29
2	30	30
3	30	6
4	30	1
5	12	7
6	12	7
15	20	9
25	8	1
30	12	1
31	12	7
32	12	6
33	12	5
34	12	12

Adapted from: J. Hubert, "Ambient Air Levels of Particulates, Lead, Zinc, Cadmium, and Arsenic in El Paso, Texas" (M.S. Thesis, The University of Texas at El Paso, 1979).

The 12 month growing season in the Lower Valley has led to problems with the use of pesticides. Many small communities and farm settlements are located adjacent to agricultural fields. It is very difficult to spray the fields but not the dwellings. Potable water is not readily available to all parts of the Lower Valley and many families depend upon shallow wells or irrigation canals for household water. Recently, the U.S. Fish and Wildlife Service tried to close Arroyo Colorado (a natural drainage canal) to fishing because of pesticide concentrations. Persons in the area have been found with unacceptable levels of pesticides in their bodies.[6]

A problem unique to the border is going through customs. Mexico has its main inspection stations some kilometers deep inside that country, but the United States has its inspection stations adjacent to the border. This causes traffic to back-up and wait for long periods of time before entering the United States. Calculations made for the year 1977 of carbon monoxide emissions from vehicles within the El Paso–Cd. Juarez air shed (Table 5) indicate approximately three percent of carbon monoxide emissions within the air shed were due to vehicles waiting to pass through United States Customs. Other border communities have problems of a similar nature.

El Paso, Eagle Pass, and Brownsville have been declared nonattainment in suspended particulates. In part, this is due to mineral products—lime-

6. Burns, *Organchlorine Pesticide and Polychlorinated Biophenyl Residues in Biopsided Human Adipose Tissue—Texas, 1969–72*. 7 PESTICIDE MONITORING J. 122–26 (1974).

TABLE 3

SUMMARY OF LEVELS BY SITE AND RANGE OF ARSENIC IN THE AMBIENT AIR OF EL PASO, TEXAS, 1972–1979

Site	Quarters Tested	0–0.49	Number of Quarters with ranges of 0–0.49 μg/m³	0.50–0.99	1.5+
1	30	30	0	0	0
2	30	15	9	4	2
3	30	29	1	0	0
4	30	30	0	0	0

Adapted from: J. Hubert, "Ambient Air Levels of Particulates, Lead, Zinc, Cadmium, and Arsenic in El Paso, Texas" (M.S. Thesis, The University of Texas at El Paso, 1979).

TABLE 4

SUMMARY OF LEVELS BY SITE AND RANGE OF CADMIUM IN THE AMBIENT AIR OF EL PASO, TEXAS, 1972–1979

Site	Quarters Tested	Number of Quarters with ranges of 0–0.04	0.50–0.09	1.0–0.29	0.30–0.49	0.50+
1	30	16	12	2	0	0
2	30	0	2	9	9	10
3	30	13	14	3	0	0
4	30	28	2	0	0	0

Adapted from: J. Hubert, "Ambient Air Levels of Particulates, Lead, Zinc, Cadmium, and Arsenic in El Paso, Texas" (M.S. Thesis, The University of Texas at El Paso, 1979).

stone, gravel, sand, gypsum, etc.—being quarried from Eagle Pass to El Paso. The intensive agricultural operations in the Lower Rio Grande Valley and dirt roads along the entire border are also major contributors to the suspended particulates. Particles from human activities can be abated to some degree at least. Another major source of suspended particulates is naturally-occurring dust storms. There is little that can be done about those.

What does the future hold for the air quality of this area along the border? El Paso and Brownsville are two of the most rapidly growing regions in the United States. Their sister cities in Mexico, Cd. Juarez and Matamoros, also are growing rapidly. Obviously, international traffic across the Rio Grande will increase enormously.[7] The present bridge capacity at El Paso–Cd. Juarez will be exceeded around 1986; the Laredo–

7. METROPOLITAN PLANNING ORGANIZATION, CITY OF EL PASO, TRANSIT CORRIDOR ANALYSIS: EL PASO-JUAREZ 89 (1979).

TABLE 5

CARBON MONOXIDE EMISSIONS IN THE EL PASO–CD. JUÀREZ AIR SHED

Area	*Kg. CO Emitted*	*%*
El Paso	71,011,517	83
Cd. Juarez	7,685,947	9
Fort Bliss	4,098,275	5
Bridge crossings	2,458,723	3

Adapted from: H. Applegate, Carbon Monoxide Concentrations in El Paso for 1977 *in* Air Quality Issues in the El Paso/Cd. Juarez Border Region (Gingerich, ed.) (1981).

Nuevo Laredo bridge is already inadequate. More bridges will have to be built to handle the projected three percent yearly increase in traffic. Unless the U.S. Customs Service enters the twentieth century and speeds up entry procedures, carbon monoxide emissions from waiting vehicles will exceed the already high concentrations.[8]

During the 1960s and '70s, the mining sector expanded rapidly in El Paso as did the metal products sector. Both sectors have a potential for polluting the air; both are heavy users of water. El Paso is eagerly seeking water in New Mexico but faces a long legal battle to obtain it. In the meantime, water will become both scarce and expensive. The rising water costs may curtail the mining and metal products sectors.[9]

A rapidly growing industry is that of textile production. It has little potential for air pollution and uses relatively little water. This industry may well play the dominant role in El Paso's economy in the future.

Agriculture and industries related to agriculture are the chief economic bases for the Lower Rio Grande Valley. They will remain so for at least another decade. However, the Mexican oil industry is moving northward along the coast and major petro-chemical complexes have been planned for the Brownsville–Matamoros area. The ship channel from the Gulf to the area has led to many new industries along it. There is every indication this will continue. Steps should be taken now as the potential for agricultural-type air pollution ebbs to ensure the forthcoming petro-chemical complex preserves the quality of air.

A new problem in air pollution is just beginning to be recognized—abandoned waste disposal sites and abandoned industrial facilities. Metal-

8. U.S. Dep't. of Health, Education and Welfare, Industrial Hygiene Investigations at the Bridge of the Americas and Paseo del Norte Crossing of the El Paso Border Station, El Paso, Texas, 22 (unpublished report, 1974), and STEWART, AIR POLLUTION STUDY OF THE INTERNATIONAL BRIDGE, LAREDO, TEXAS, 13 (Texas State Department of Health 1968).

9. Ayer and Hoyt, *Industrial Growth in the U.S. Border Communities and Associated Water and Air Problems: An Economic Perspective*, 17 NAT. RES. J. 585–633 (1977).

bearing ores were dumped near a railroad siding in El Paso's outskirts during World War II. The dump site was subsequently abandoned but traces of ores coated the soil surface. Early air pollution monitoring gave high values in the area. Subsequently, apartments and roads were built over the area effectively sealing the surface from wind action.

An abandoned pesticide facility in the Lower Rio Grande Valley is a source of serious air pollution. Soil from the site has been moved by winds into nearby homes and schools. Concentrations of DDT, DDE, DDD, lindane, dieldrin, aldrin, toxaphene, heptachlor, and chlordane hundreds of thousands of times more than allowed by federal standards have been measured.[10]

Currently, Texas laws governing the abandonment of industrial facilities do not deal with potential hazards left behind. Waste sites have not been located on city-county maps in the past. As cities grew, many of the sites were built over. A potential for another Love Canal may exist along the border.

RECOMMENDATIONS

1. Regional staffs of the Texas Air Control Board should be increased in the El Paso and Brownsville regions to cope with the growing industrial sector.
2. Dirt roads within municipalities should be paved to help reduce particulate pollution.
3. Cooperative efforts should be made with U.S. Customs to speed vehicular movement through inspection points to help control carbon monoxide concentrations.
4. More cooperation between sister cities should be given high priority.

CALIDAD DEL AIRE EN LA REGION TRANSFRONTERIZA: PROBLEMAS Y PROSPECTOS DESDE EL PASO HASTA BROWNSVILLE

A lo largo del sector tejano de la frontera, la calidad del aire implica muchos problemas de sanidad. Los procesos agrícolas y pesticidas emiten partículas peligrosas. El lento tráfico internacional provoca un alto nivel de monóxido de carbono en la frontera. La parte baja del Valle del Río Grande sufre el esperado influyo de barcos petroleros mexicanos y complejos petroquímicos. Una recomendación es la de incrementar el personal del Consejo de Control del Aire de Texas.

10. Cook, *EPA Tests Houses, Schools for Poisonous Chemicals*, Dallas Morning News, Feb. 14, 1981, at 1.

El Problema Actual en la Calidad del Aire en la Región Transfronteriza

El Paso ha sido calificado por la Agencia de Protección Ambiental como el segundo lugar en problemas de calidad del aire en Texas, y sólo superado por Houston. Esto se debe principalmente a su cercanía a las montañas, al clima árido y a los períodos de inversión en la temperatura. Ciertas áreas de la ciudad se han designado como no consecuentes ni para el monóxido de carbono de partículas suspendidas, y todo el condado de El Paso se ha declarado como no-consecuente para el ozono. Además, el condado tiene la mayor de las 133 fuentes industriales en el oeste de la frontera de Tejas que son potencialmente contaminantes.

El alto nivel de plomo y otros metales pesados en el aire ambiental en los dos lados de la frontera, ha resultado en que los niños tienen un alto grado inaceptable de plomo en su sangre. A pesar de las modificaciones a las plantas contaminantes y al creciente uso de gasolina sin plomo, estos niveles ambientales se han mantenido.

En la región central fronteriza, el área de Brownsville–San Benito–Harlingen que crece muy rápido se ha llenado de granjas y muchas emisiones se producen del proceso agrícola o los relativos a la industria. Esto ha contribuído a que cuatro áreas hayan sido clasificadas como no-consecuentes para partículas en suspensión, incluyendo Eagle Pass que de por sí ella no tiene fuentes de contaminación. Además, el uso de pesticidas en el año ha causado que muchas familias que dependen de pozos y canales de irrigación para el agua necesaria para su manutención traigan niveles inaceptables de pesticidas en sus cuerpos.

Un camino sin pavimentar a lo largo de la frontera contribuye al problema de las partículas suspendidas en la parte baja del Valle de Río Grande, además de las operaciones mineras y agrícolas. Mientras estas actividades humanas pueden ser parcialmente disminuidas, una fuente más grande, menos susceptible de controlar, son las tormentas de polvo, provocadas por la naturaleza.

Proyecciones

El futoro tráfico internacional aumentará entre las ciudades fronterizas. Se necesitan mejores puentes y procedimientos aduanales más eficientes para impedir un incremento en los ya de por sí altos niveles de monóxido de carbono emitidos por los autos que esperan para ser inspeccionados.

Mientras que los sectores metalúrgicos y mineros de El Paso tienen un potencial alto de contaminación, pueden ser que se supriman por el aumento del costo del agua. La industria predominante en la economía de El Paso pudiera ser la industria textil, que crece rápidamente con su bajo potencial de contaminación del aire y por utilizar pocas cantidades de agua. El Valle Bajo de Río Grande debe actuar hoy para prever los peligros de contaminación debido al influjo esperado de los barcos de la industria petrolera mexicana y de los complejos petroquímicos. Ya están proyectados dichos complejos para el área de Brownsville–Matamoros.

Un nuevo problema en la contaminación del aire ha surgido de instalaciones abandonadas y depósitos de desechos, tierra que contiene variadas substancias químicas que provienen de una instalación de pesticidas abandonada en el Valle Bajo del Río Grande, ha sido trasladada por el aire hasta escuelas y hogares cercanos. Las leyes de Texas fallan en tratar con los peligros dejados atrás. Las ciudades que crecen sobre sitios desconocido pueden llevar a un "Love Canal" a lo largo de la frontera.

Las recomendaciones son: 1) aumentar el personal de la Junta de Control del Aire de Texas en El Paso y Brownsville, 2) pavimentar las carreteras que tienen dentro de los municipios, 3) dar una mayor prioridad a la cooperación entre ciudades hermanas, y 4) acelerar el movimiento de vehículos en los puntos de inspección de la frontera.