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10 OUR CHILDREN'S EARTH FOUNDATION, and
11 COMMUNITIES FOR A BETTER ENVIRONMENT

12 **IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA**

13 **IN AND FOR THE COUNTY OF SAN FRANCISCO**

14 ENVIRONMENTAL LAW FOUNDATION; OUR
15 CHILDREN'S EARTH FOUNDATION; and
16 COMMUNITIES FOR A BETTER
17 ENVIRONMENT, On Behalf of the General Public

18 Plaintiffs,

19 v.

20 LAIDLAW TRANSIT INC. dba LAIDLAW
21 EDUCATION SERVICES; LAIDLAW TRANSIT
22 SERVICES, INC.; DURHAM SCHOOL
23 SERVICES; DURHAM SCHOOL SERVICES,
24 L.P.; NATIONAL EXPRESS CORPORATION; and
25 DOES 1 through 100, inclusive,

26 Respondents.

CASE NO.: CGC-06-451832

**DECLARATION OF DR. RAJIV
BHATIA, M.D., M.P.H. IN SUPPORT
OF PLAINTIFFS' MOTION FOR
PRELIMINARY INJUNCTION**

Date: June 8, 2007

Time: 1:30 p.m.

Court: Dept. 613

Judge: Hon. Ernest H. Goldsmith

Complaint filed: May 2, 2006

Trial Date: Sept. 4, 2007

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(Continuation of listing of additional counsel)

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1 I, Dr. Rajiv Bhatia, M.D., M.P.H., hereby declare:

- 2 1. I have personal knowledge of the following and could competently testify thereto if
3 called as a witness.
- 4 2. I am the Director of the Occupational and Environmental Health Section of the San
5 Francisco Department of Public Health as well as the Director of the Department's Health
6 Inequities Research Unit.
- 7 3. I am also an Assistant Clinical Professor of Medicine at the University of California, San
8 Francisco.
- 9 4. I have a Medical Doctor degree from Stanford University.
- 10 5. I have a Master in Public Health (M.P.H.) degree from the University of California,
11 Berkeley.
- 12 6. I have a Bachelor of Science degree in electrical engineering from Stanford University.
- 13 7. I completed my residency in the field of Internal Medicine at Stanford University
14 Hospital and Mount Zion Hospital.
- 15 8. I completed a fellowship in Occupational and Environmental Medicine at the University
16 of California, San Francisco.
- 17 9. I have conducted and published original research in the area of occupational and
18 environmental health, epidemiology, environmental planning, and public policy
- 19 10. My work involves developing, implementing, and evaluating environmental health policy
20 and programs in an urban area.
- 21 11. A true and correct copy of my curriculum vitae is attached hereto as Exhibit A.
- 22 12. I have published numerous peer-reviewed scientific journal articles. Among my these is
23 the article, "Diesel Exhaust Exposure and Lung Cancer," which was published in the
24 journal, *Epidemiology*, vol. 9(1), page 84 (1998). In that article, we conducted a meta-
25 analysis of 29 published cohort and case-control studies concerning exposure to diesel
26 engine exhaust. We concluded that the evidence supports a causal association between
27 increased risks for lung cancer and exposure to diesel exhaust. (Exhibit B to Declaration

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of Rajiv Bhatia (“Ex. B”))

- 13. Diesel exhaust contains over 40 chemicals that California Air Resources Board has identified as Toxic Air Contaminants. (Calif. Office of Environmental Health Hazard Assessment, Heath Effects of Diesel Exhaust Fact Sheet (Aug. 2000), (Ex. C); Solomon, “Exhausted by Diesel: How America’s Dependence on Diesel Engines Threatens Our Health,” p. 6. (NRDC, Apr. 1998), (Exhibit L to Declaration of Eduardo Behrentz (“Ex. L to Behrentz Dec.”))
- 14. Approximately 94% of the mass of diesel particulate matter is less than 2.5 microns in diameter. Because of their small size, these particles can be inhaled and a portion will become trapped within the small airways of the lung. (California Scientific Review Panel, Report on Diesel Exhaust, ¶5 (May 20, 2004) (Ex. D))
- 15. Children are more susceptible to adverse health effects created by diesel exhaust because their organs and immune systems are still developing. It is established that air pollution can damage lung cellular tissue. If exposure to air pollution damages lung tissue cells that are growing, the lung may not achieve its full growth and function. Recent research has confirmed that exposure to air pollution from vehicles, particularly trucks, can reduce lung function in children. (Brunekreef, B. et al. “Air pollution from truck traffic and lung function in children living near motorways.” *Epidemiology*. 1997; 8:298-303. Gauderman WJ, Avol E, Gilliland F, Vora H, Thomas D, Berhane K, McConnell R, Kuenzli N, Lurmann F, Rappaport E, Margolis H, Bates D, Peters J. The effect of air pollution on lung development from 10 to 18 years of age. *N Engl J Med*. 2004 Sep 9;351(11):1057-67.)
- 16. Children are also more susceptible to ambient air pollution because they have a higher respiratory rate and breathe a higher volume of air relative to their body size. (Dockery, et al, “Effects of Inhalable Particles on Respiratory Health of Children, *Am. Rev. Respir. Dis.* 1989, 139, 587-594; Thurston, G.D., *Particulate Matter and Sulfate: Evaluation of Current California Air Quality Standards with Respect to Protection of Children,*” (2000)

- 1 New York School of Medicine, (www.arb.ca.gov/ch/ceh/001207/pmsul.PDF) (Ex. E))
- 2 17. Diesel engine exhaust was added to the Proposition 65 list of chemicals known to the
3 state to cause cancer in 1990 due to evidence that people exposed to the chemical had
4 significantly elevated incidence of lung cancer. (Calif. Office of Environmental Health
5 Hazard Assessment, Health Effects of Diesel Exhaust Fact Sheet (Aug. 2000) (Ex. C);
6 State of Calif. Office of Environmental Health Hazard Assessment, List of Chemicals
7 Known to the State to Cause Cancer
8 (http://www.oehha.ca.gov/prop65/prop65_list/files/P65single120806.pdf) (Ex. F))
- 9 18. In February 2006, the California Air Resources Board (“CARB”) concluded that “Diesel
10 particulate matter is the largest contributor to health risk posed by toxic air pollutants,
11 constituting approximately 70 percent of the total statewide risk.” (CARB Initial
12 Statement of Reasons: Proposed Amendments to Verification Procedure for In-use
13 Strategies to Control Emissions from Diesel Engines, p. 5 (Ex. J to Behrentz Dec.))
- 14 19. California’s Scientific Review Panel classified diesel exhaust as the sixth most potent
15 carcinogenic substance following dioxins, chromium VI, arsenic and others. (State of
16 California, Findings of the Scientific Review Panel on the Report on Diesel Exhaust
17 (Apr. 22, 1999) (Ex. D))
- 18 20. Exposure to diesel exhaust can have a number of other immediate health effects on
19 children, ultimately impacting their growth and development. Diesel exhaust can irritate
20 the eyes, nose, throat and lungs, and it can cause coughs, headaches, lightheadedness and
21 nausea. In studies with human volunteers, diesel exhaust particles made people with
22 allergies more susceptible to the materials to which they are allergic, such as dust and
23 pollen. Exposure to diesel exhaust also causes inflammation in the lungs, which may
24 aggravate chronic respiratory symptoms and increase the frequency or intensity of asthma
25 attacks. (OEHHA Diesel Fact Sheet)
- 26 21. Diesel engines also produce nitrogen oxides. Nitrogen oxides can damage lung tissue,
27 lower the body's resistance to respiratory infection and worsen chronic lung diseases,

- 1 such as asthma. (OEHHA Diesel Fact Sheet)
- 2 22. Diesel engines are a major source of fine-particle pollution. Numerous studies have
3 linked elevated particle levels in the air to increased hospital admissions, emergency
4 room visits, asthma attacks and premature deaths among those suffering from respiratory
5 problems. Exposure to fine particles is associated with increased frequency of childhood
6 illnesses. (OEHHA Diesel Fact Sheet)
- 7 23. Epidemiologic studies have consistently demonstrated that children living in proximity to
8 freeways or busy roadways have poorer health outcomes. A number of these studies
9 have identified either heavy duty trucks or specific constituents of diesel exhaust as
10 casual factors and are described briefly below.
- 11 24. A study of children in the Netherlands found that lung function declined with increasing
12 truck traffic density especially for children living within 300 meters of motorways.
13 (Brunekreef, B. et al. "Air pollution from truck traffic and lung function in children living
14 near motorways." *Epidemiology*. 1997; 8:298-303.)
- 15 25. Children in Erie County, New York hospitalized for asthma were more likely to live
16 within 200 meters of heavily trafficked roads. (Lin, S. et al. "Childhood asthma
17 hospitalization and residential exposure to state route traffic." *Environ Res*. 2002;88:73-
18 81.)
- 19 26. Among children living within 150 m of a main road in Nottingham, United Kingdom, the
20 risk of wheeze increased with increasing proximity to the road. (Venn. et al. "Living near
21 a main road and the risk of wheezing illness in children." *American Journal of
22 Respiratory and Critical Care Medicine*. 2001; Vol.164, pp. 2177-2180.)
- 23 27. In Oakland California, in children with higher exposure to traffic related pollutants had
24 more asthma and bronchitis symptoms. (Kim, J. et al. "Traffic-related air pollution and
25 respiratory health: East Bay Children's Respiratory Health Study." *American Journal of
26 Respiratory and Critical Care Medicine* 2004; Vol. 170. pp. 520-526.)
- 27 28. In a low income population of children in San Diego, children with asthma living with

- 1 550 feet of high traffic flows were more likely than those residing near lower traffic
2 flows to have more medical care visits for asthma. (English P., Neutra R., Scalf R.
3 Sullivan M. Waller L. Zhu L. "Examining Associations Between Childhood Asthma and
4 Traffic Flow Using a Geographic Information System." (1999) Environmental Health
5 Perspectives 107(9): 761-767)
- 6 29. In a study of Southern California School Children, living within 75 m of a major road
7 was associated with an increased risk of lifetime asthma, prevalent asthma, and wheeze
8 (McConnell, R. B., K. Yao, L. Jerrett, M. Lurmann, F. Gilliland, F. Kunzli, N.
9 Gauderman, J. Avol, E. Thomas, D. Peter, J. (2006). "Traffic, susceptibility, and
10 Childhood Asthma." Environmental Health Perspectives 114(5): 766-772.)
- 11 30. In a study conducted in 12 southern California communities, children who lived with 500
12 meters of a freeway had reduced growth in lung capacity relate to those living greater
13 than 1500 feet from the freeway. (Gauderman WJ, Avol E, Gilliland F, Vora H, Thomas
14 D, Berhane K, McConnell R, Kuenzli N, Lurmann F, Rappaport E, Margolis H, Bates D,
15 Peters J. The effect of air pollution on lung development from 10 to 18 years of age. N
16 Engl J Med. 2004 Sep 9;351(11):1057-67. Erratum in: N Engl J Med. 2005 Mar
17 24;352(12):1276.)
- 18 31. I agree with the conclusion of the California Office of Environmental Health Hazard
19 Assessment that there is no safe level of exposure to diesel exhaust. (Calif. Office of
20 Environmental Health Hazard Assessment, Health Risk Assessment for Diesel Exhaust
21 (May 1998) (Ex. H to Behrentz Dec.))
- 22 32. Several peer-reviewed scientific journal articles and published studies have concluded
23 that diesel engine exhaust levels on school buses are significant due largely to "self-
24 pollution," or the bus's own exhaust entering the passenger compartment. (E. Behrentz,
25 et al, "Measuring Self-Pollution in School Buses Using a Tracer Gas Technique," 30
26 Atmospheric Environment p. 3735 (Apr. 2004) (Ex. C to Behrentz Dec.); E. Behrentz, et
27 al., "Relative Importance of School Bus-Related Microenvironments to Children's

1 Pollutant Exposure,” *Journal of Air and Waste Management Ass’n* (2005) (Ex. D to
2 Behrentz Dec.); J. Marshall, E. Behrentz, “Vehicle Self-Pollution Intake Fraction:
3 Children’s Exposure to School Bus Emissions,” 39 *Environ. Science and Technology*
4 2559 (2005) (Ex. E to Behrentz Dec.); L. Sabin, E. Behrentz, et al., “Characterizing the
5 Range of Children’s Air Pollutant Exposure During School Bus Commutes,” 15 *Journal*
6 *of Exposure Analysis and Environmental Epidemiology* 377 (2005) (Ex. F to Behrentz
7 Dec.); L. Sabin, et al., “Analysis of Real-Time Variables Affecting Children’s Exposure
8 to Diesel-Related Pollutants During School Bus Commutes in Los Angeles,” 39
9 *Atmospheric Environment* 5243 (2004) (Ex. G to Behrentz Dec.); Solomon, et al., “No
10 Breathing in the Aisles: Diesel Exhaust Inside School Buses,” p. 8 (2001) (Ex. N to
11 Behrentz Dec.)) I have reviewed these studies.

12 33. CARB has identified the school bus microenvironment as resulting in one of the most
13 significant sources of exposure to diesel exhaust due to high levels of “self-pollution.”
14 (CARB Initial Statement of Reasons: Proposed Amendments to Verification Procedure
15 for In-use Strategies to Control Emissions from Diesel Engines, p. 19-20 (Ex. J to
16 Behrentz Dec.))

17 34. In my opinion, exposure to diesel engine exhaust on school buses is a very significant
18 health risk due to at least four factors: (1) diesel exhaust is a highly potent human
19 carcinogen; (2) high levels of diesel exhaust have been found to accumulate on school
20 buses due largely to self-pollution; (3) children are exposed to diesel exhaust every day,
21 for well over a decade; and (4) children are much more susceptible to cancer due to their
22 higher respiratory rates, developing respiratory systems, and other factors. (5) exposure to
23 constituents in diesel exhaust impair lung function development and cause or aggravate
24 respiratory illness in children, in turn negatively affecting a child’s growth and
25 development. (CARB, *Characterizing the Range of Children’s Pollutant Exposure*
26 *During School Bus Commutes* (Oct. 10, 2003), pp. 3-4 (Ex. B to Behrentz Dec.))

27 35. True and correct copies of the above-mentioned studies are attached to this declaration or

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to the other declarations referenced above and submitted herewith.

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I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed at _____(location), California, on March _____, 2007.

Dr. Rajiv Bhatia, M.D., M.P.H.

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Proof of Service

I am employed in the County of San Mateo, California. I am over the age of 18 and not a party to this action. My business address is 601 Gateway Blvd., Suite 1000, South San Francisco, California, 94080.

On May 15, 2007, I served the foregoing document described as:

DECLARATION OF DR. RAJIV BHATIA, M.D., M.P.H. IN SUPPORT OF PLAINTIFFS' MOTION FOR PRELIMINARY INJUNCTION

on the parties listed below by US First Class Mail or other manner (as noted):

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I declare under penalty of perjury of the laws of the California that the foregoing is true and correct and that this was executed on May 15, 2007 in South San Francisco, California.

Bonnie Heeley