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## BNSF responds to 'misinformation' on rail hub's environmental impact

**Editor's note:** Steve Forsberg, a spokesman for the BNSF Railway, sent this e-mail to The Kansas City Star on Monday afternoon in response to a [report](#) about environmental concerns surrounding the company's planned rail hub near Gardner.

BNSF, with the help of its science consultants, addressed the misinformation some groups have spread concerning environmental issues in California and BNSF's new intermodal facility near Kansas City, in our responses to the Corps. Given that misinformation was repeated in today's story without the benefit of how those issues were addressed, we thought it would be helpful if we summarized them for you for future reference. We apologize in advance for the length of the response which is drawn from the documents now on file with the Corps that you may not have had time to read in detail yet.

The Health Risk Assessments (HRAs), which were conducted with the full cooperation of the rail industry in California, are a tool for the California Air Resources Board (CARB) to understand and evaluate theoretical maximum health risks of rail yard operating impacts on the environment and the communities in which the rail yard operates, and to assist in managing the risk. A health risk assessment is NOT intended to identify the actual real world likelihood of risk to contract cancer as some have claimed.

More importantly the HRA's used mathematical models to evaluate the theoretical maximum health impacts from exposure to certain chemicals or air emissions released from a facility or pollutants found in the air. In order to perform a rail yard health risk assessment, data was needed on the levels or concentrations of diesel particulate matter (PM emissions from rail yard operations.).

At this time, there is no monitoring technique that allows scientists to directly measure diesel PM in the air. In fact, this study did not incorporate actual air monitoring data. In order to estimate the concentrations of diesel PM, an emissions inventory was developed and an air dispersion model was then used to estimate the possible concentration of diesel PM in the air. The air dispersion model uses a variety of information, such as the amount of pollutant emissions, weather or meteorological data, and the location and height of the source of the emissions release, any of which can greatly affect the final results.

The information presented in the CARB reports assumes the person is living at the same residential location for 70 years, is outdoors 24 hours a day for 350 days of the year, never goes inside his/her residence, and is doing moderate exercise the entire time. These HRAs are designed to be "health protective," which means that the assessments use the most conservative data available to err on the side of protecting public health. Whether diesel exhaust causes some form of cancer in humans is still highly questionable since the existing linkage is only in some species of test animals. In fact, under a current diesel exhaust study of the mining industry by the National Institute for Occupational Safety and Health (NIOSH) in conjunction with the National Cancer Institute and the Mining Safety and Health Administration, preliminary results are causing a reevaluation of the extent and severity of health effects from exposure to diesel exhaust. The National Research Council is currently evaluating the study.

The assessments also calculate the expected maximum incremental number of cancer cases above the risk associated with a given region. To give you some reference perspective, the overall risk of all types of cancer in the general U.S. Population is about 250,000 cases for every million individuals, or about one in four people. In the Los Angeles basin, the regional cancer risk attributable to air pollution is 1,400 in a million. Living near a freeway, like the Golden State (I-5) or Long Beach (I-710) freeways in Los Angeles, the cancer risk is estimated at 530 in a million above the regional risk. Risk of contracting cancer is also sometimes presented as the risk presented by a particular chemical exposure pathway like breathing the air in a given region. Breathing current levels of pollutants in California's ambient air over a 70-year lifetime is estimated to yield a cancer risk of 760 in a million. (Source Cal-EPA)

The study's main purpose is to assist in planning reductions and comparing sources. (Note: as a follow-up to the HRA's (which were done in 2005) BNSF looked at each emissions source and analyzed that emissions source over a course of a year. For example, we rode around on trucks for several days on site and observed distance traveled and time idling within the facility. We took that information and multiplied it by the number of trucks that come into the

facility each year. A comprehensive survey of San Bernardino rail yard customers conducted later indicated the average age of the drayage trucks serving the yard was younger than that assumed in the HRA study, and therefore actual truck emissions are lower than CARB HRA estimates.)

The HRAs in California were calculated with a very conservative cancer slope factor (in our opinion) for diesel emissions developed by California, and is used only in California. This cancer slope factor is not used by EPA. In fact some of the assumptions required for use in California are not used by the USEPA.

Accordingly, different estimated health risks for similar facilities in different states could be quite different because of the distinct set of different guidelines used in each analysis. Among the more important specific factors rendering invalid the use of ratios between measures of throughput (e.g., numbers of lifts) and estimated health risks are the fact that each rail yard is distinct with respect to the local meteorological conditions, the type of equipment used, the activity patterns of the equipment, and the location and number of people who work or live in the vicinity of each yard.

For example, as a CARB official noted in a news article in the Kansas City Star (credit to you on that article Brad), the relatively higher CARB estimated cancer risks from the San Bernardino intermodal facility were a result of individuals living in the immediate vicinity of concentrated emissions (next to the facility entrance). However, higher emissions at the larger Barstow rail yard (a large conventional railcar classification yard) did not have comparable risks because emissions were dispersed prior to reaching the local community.

Additionally, California calculates cancer risk from DPM based on an approach that has been rejected by the USEPA. The HRAs performed for the rail yards in California were not designed to be predictions of adverse health to the communities, but were designed to assess relative risk in developing plans for diesel emission reductions.

Furthermore, many of the health studies cited by some as evidence of rail yard-related health impacts are studies of populations exposed to multiple sources of industrial and transportation-related emissions (e.g., freeways) and photochemical smog in Southern California, and the implication that the health effects observed in these studies can be attributed to emissions from one or more intermodal facilities in Southern California is misleading.

Reasons USEPA cited for its conclusion the approach adopted by California for quantifying cancer risk is not valid:

Diesel exhaust is a complex mixture of hydrocarbons, particulates, gases, water, and other compounds (the precise composition of the mixture depends on many factors, including the fuel source, engine type, engine age, and operating condition). For both the USEPA and California, the general approach to estimating cancer risk from exposure to mixtures - such as combustion exhaust - is to select a subset of so-called indicator chemicals (e.g., the principal components of the exhaust), multiply the estimated concentration of each by a chemical-specific cancer slope factor (CSF), and then add the risks estimated for each indicator chemical. That is, the sum of the health risks from each individual chemical is used as an estimate of the risk posed by the mixture as a whole. Under current USEPA risk assessment practice this approach is used, for example, when estimating health risks from combustion of fuels such as gasoline, fuel oil, wood, natural gas, etc. While California also generally relies on this indicator chemical approach for quantifying cancer risks from mixtures, they have developed an alternative approach for quantifying cancer risks from diesel exhaust. In contrast to the approach used for other mixtures, California developed a CSF to represent the carcinogenicity of the entire mixture of chemicals in diesel exhaust, using diesel particulate matter (DPM) as a surrogate for that mixture (Office of Environmental Health Hazard Assessment [OEHHA], 1998). Both California and the USEPA have adopted a concentration limit of 5 ug/m3 for diesel exhaust particulate matter (DPM) as a way to evaluate the non-carcinogenic health effects of diesel exhaust.

California's CSF was developed from epidemiology studies on railroad workers in which quantitative correlations were drawn between exposure to diesel exhaust and the incidence of lung cancer. Whether these epidemiology studies are adequate to support development of a CSF for diesel exhaust, using DPM as a surrogate, is the central issue in the different approaches used to quantify diesel exhaust-attributable risk by California and the USEPA.

One of the studies central to California's analysis was that of Garshick et al. (1988). The Garshick et al. (1988) study represents a retrospective analysis of 55,407 white male railroad workers from across the U.S. The lung tumor incidence for these railroad workers was reported in Garshick et al. (1987, 1988) and the estimated exposures were reported in Woskie et al. (1988a,b).

The USEPA (2002) identified a number of limitations in the Garshick et al. (1988) data, including:

- Inadequate information on exposure to diesel exhaust (i.e., assigning who was exposed and who was not exposed);
- Lack of knowledge of when workers first began working with diesel equipment, and,
- Lack of information on smoking and other lifestyle correlates of lung cancer risk.

Of particular concern to the USEPA, to Dr. K. Crump (1991, 1999, 2001) and to the members of an expert panel, was the fact that lung cancer risks among the exposed workers decreased with increasing length of exposure – the opposite biological effect from what is expected for a carcinogen. Additionally, one of the categories of workers

potentially exposed to high levels of DPM (shop workers), had no elevated cancer risk. Because of these findings, the USEPA has not adopted a CSF (or unit risk factor) for diesel exhaust emissions, stating that, "the available data are too uncertain at this time" (USEPA 2002).

Garshick subsequently published the results of a longer follow-up study of the same workers and found the same trend (Garshick et al., 2004) - suggesting that the original observation of a negative correlation between exposure and lung cancer risk was not an artifact attributable to a truncated follow-up period. Despite the passage of seven years since the original analysis, the USEPA has not revised its position on the adequacy of available data on DPM, has not developed a CSF (USEPA, 2009), and has not adopted California's CSF for DPM.

Our focus continues to be on what is most important – our continued efforts to reduce emissions from our operations. Rail already has a tremendous environmental advantage over the all-highway alternative (Two to four times as fuel efficient. BNSF's trains now move each ton of freight an average of 470 miles on a gallon of fuel) and we intend to continue to build on that advantage. We have been making record capital investments for years in new, cleaner, more fuel efficient locomotives, idling reduction technology (which is the more effective, near-term fuel consumption and emissions reduction investment) installed on more than 70 percent of our locomotive fleet (all new units automatically come equipped with it and we will continue to invest in idling reduction technology for older locomotives until we have equipped 100% of the fleet.) BNSF's new intermodal facility between Edgerton and Gardner, with its wide-span electric cranes, will be the greenest Intermodal facility in the U.S. when it is constructed.

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