UNIVERSITY OF CALIFORNIA

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Development of a Market-Based Strategy to Reduce Emissions from Locomotives

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Environmental Science and Engineering

by

Marijke Lynne Bekken

1995

The dissertation of Marijke Lynne Bekken is approved.

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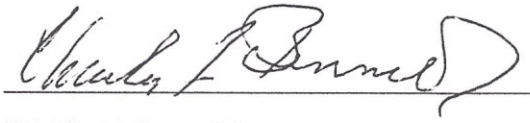

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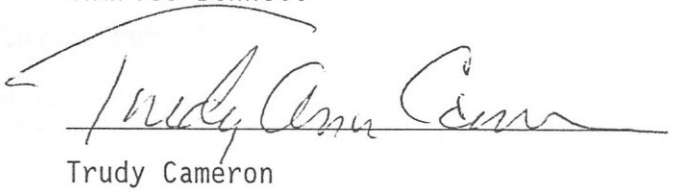

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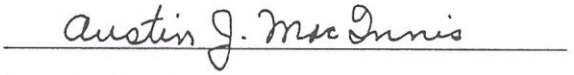

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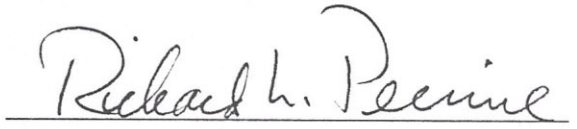

Richard L Perrine, Committee Chair

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This paper has not been subject to Air Resources Board review and should not be construed to represent the policy of this agency. Mention of any particular manufacturer or product should not be construed as an endorsement.

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ABSTRACT OF THE DISSERTATION

Development of a Market-Based Strategy to
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Marijke Lynne Bekken
Doctor of Environmental Science and Engineering
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Professor Richard L Perrine, Chair

Pollution levels in many California air basins violate both state and federal ambient air quality standards. Legislation and regulations have been passed or approved that have resulted in significant reductions of pollution from both stationary and mobile sources. However, these measures have not been sufficient to bring California into compliance with the standards. The 1988 California Clean Air Act recognized that unregulated mobile sources, such as utility equipment, construction and farm equipment, marine vessels, and locomotives, may have substantial emissions. It mandated that the Air Resources Board adopt regulations to reduce emissions from these sources. The 1990 amendments to the federal Clean Air Act

preempted California from setting emission standards for new locomotives. Therefore, regulations must focus on the in-use fleet. These regulations could involve mandating specific technologies (command and control) or could employ a more flexible market-based strategy. The dissertation presents a summary of the locomotive contribution to California's air quality problems, discusses the advantages and disadvantages of command and control versus market-based control strategies, provides some examples of past market-based programs that have been implemented, and discusses design criteria that contribute to the effectiveness of any proposed program. The market-based strategy developed focuses on controlling emissions from the locomotive fleet operating in California.