

Construction and Evaluation of a Bituminous Roadway Constructed with Municipal Solid Waste Combustor Ash

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1.0 ABSTRACT

County State Aid Highway (CSAH) 13, located in Polk County Minnesota, was to be paved with 2.25 miles of new bituminous in October of 2000. Prior to the end of the 2000 construction season, a portion of one lane of the base course was installed, with the remainder to be completed in spring of 2001. The bituminous was amended with ash generated at the municipal solid waste combustor located in Fosston Minnesota. One third of the road was to be paved with traditional bituminous, one third was to be paved with bituminous in which a portion of the aggregate was replaced with "new" ash and one third was to be paved with bituminous in which a portion of the aggregate was replaced with "old" ash. "New" combustor ash is ash generated after the installation of an up-front materials recovery facility (MRF) and "old" combustor ash is ash generated before the installation of the MRF. Ash-amended bituminous was to be used in the base course and binder course of the pavement profile. Significant environmental and structural testing was performed prior to construction. Environmental and structural testing was also performed simultaneously with the construction process. Environmental testing completed in 2000 included: analysis of stack emissions from the bituminous plant, evaluation of breathing zone particulates at the bituminous plant, and analysis of surface water runoff from the ash-amended bituminous. Structural testing included trial mix design parameters. The road was also instrumented to collect water that may infiltrate through the ash-amended bituminous. Environmental testing to be completed in 2001 includes: evaluation of impacts to soils adjacent to the roadway and evaluation of infiltration water collected in the under-pavement collectors. Post-construction pavement testing is also to be completed in 2001. This paper presents the initial results of environmental and structural testing as well as construction issues.

2.0 INTRODUCTION

It was identified by Kiser and Zannes¹ that in 1999, 102 Waste-to-Energy (WTE) facilities were in operation in the United States, serving the disposal needs of more than 37 million people. These facilities generated about 2,800 MW of electricity from the combustion of 30 million tons of MSW. In the process, about 7 million tons of ash were produced. Most was used as landfill daily cover, as roadbed, or was disposed of in landfills. Enabling the beneficial use of ash will assure the continued operation of these valuable facilities. While most municipal waste combustors (MWCs) recover energy, there is a very small number that do not. In this paper we will refer to MWCs whether they recover energy or not.