



**CALIFORNIA STATE SCIENCE FAIR  
2009 PROJECT SUMMARY**

<b>Name(s)</b> <b>Brandon D. Miller</b>	<b>Project Number</b> <b>S0825</b>
<b>Project Title</b> <b>An Analysis of the Release of Green House Gasses from Landfills</b>	
<b>Abstract</b> <b>Objectives/Goals</b> Carbon Dioxide and Methane are green house gases that have the greatest impact because of the amount of heat that it can retain. These gases are produced from bacterial decay from organic material. In landfills the two types of landfill trash that produce the largest amount of methane are Alternative Daily Cover (ADC) and Municipal Solid Waste (MSW). In this project, the amount of methane and carbon dioxide produced from ADC must be less or equal to that of MSW to prove the hypothesis. The Environmental Protection Agency proposed to ban ADC as a cover and instead use it to produce electricity. The goal of this experiment is to prove that ADC does not produce more methane than that of MSW. <b>Methods/Materials</b> 1. Get eight standard Waste Management trash bins 2. Seal air tight with silicone and duct tape. 3. Tap and drill a hole for methane reading. 4. Go to landfill and gather contents to fill all the bins. 5. Fill Bin #1. Municipal solid waste and Alternative daily cover. 6. Fill Bin #2 Municipal solid waste (house hold waste). 7. Fill Bin #3 Commercial waste. 8. Fill Bin #4 Alternative Daily Cover (green waste). 9. Fill Bin #5 Municipal solid waste and 14 inches of water (yearly amount of rain). 10. Fill Bin #6 Municipal solid waste and 60 inches of water (yearly amount in northwest). 11. Fill Bin #7 with municipal solid waste and 12 inches of dirt. 12. Fill Bin #8 Dirt (control). 13. Leave for one week. Take CH <sub>4</sub> , CO <sub>2</sub> , and reading of all bins. <b>Results</b> As the methane was produced in the airtight bins, it was obvious the ADC was not producing more methane than MSW. The methane for ADC was 0.9% and then for MSW it was 1.1% which was .2% more than the ADC. As the eighth week passed the methane was almost even as all the other bins but yet the methane of the MSW was higher which did prove the hypothesis. <b>Conclusions/Discussion</b> The results that were found were that the bin with the highest methane concentration after eight weeks of monitoring was municipal solid waste or MSW. MSW is consisted of many different food types and also paper and plastic product which can consist of a large range of moisture where ADC can only have one small range of moisture. ADC decomposed faster it produced less methane. By proving this, it is shown that the Environmental Protection Agency or EPA does not have any reason to ban the use of this type of daily cover.	
<b>Summary Statement</b> This project is about what type of waste material really is producing the harmful gasses that is emitted from landfills and what we and the Environmental Protection Agency do to help.	
<b>Help Received</b> Waste Management INC. El Sobrante Landfill, Nick Godfrey, Michele Hampton.	