



California Science Center  
**CALIFORNIA STATE SCIENCE FAIR**  
**2001 PROJECT SUMMARY**

<b>Your Name</b> (List all student names if multiple authors.) <b>Michelle Harmon; Kevin Quinn</b>	<b>Science Fair Use Only</b>  <h1 style="margin: 0;">S0406</h1>
<b>Project Title</b> (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) <b>Quantification and Investigation of Methyl Tertiary-Butyl Ether in Our Community</b>	<b>Division</b> _ Junior (6-8) <u>X</u> Senior (9-12)
<b>Preferred Category</b> (See page 5 for descriptions.) <b>4 - Chemistry</b>	
<p><b>Abstract</b> (Include Objective, Methods, Results, Conclusion. See samples on page 14.)          Use no attachments. Only text inside these boxes will be used for category assignment or given to your judges.</p> <p><b>Objective:</b> To find out if MTBE has contaminated our communities drinking and recreational water sources? If so, is the quantity significant enough to cause problems among the wildlife and human populations?</p> <p><b>Hypothesis:</b> Based on the presence of recreational two-stroke watercrafts, we find reason to believe that both the drinking and recreational water sources for our community are contaminated with MTBE, however, not in a large enough amount to cause adverse affects.</p> <p><b>Procedure:</b> Because the procedure used to test for volatile organic compounds is beyond the capabilities of a high school lab, we pursued the knowledge and help of professional laboratories. Two analytical labs volunteered to assist us with our efforts by each testing three samples free of charge. Since we could obtain the current weekly amounts of MTBE in Canyon Lake from EVMWD, we decided to use this as a control. For both labs we collected one sample from Canyon Lake and two from Lake Elsinore since there is not information available on previous testing for MTBE on Lake Elsinore. The samples were collected in special vials and immediately taken to the labs for testing. The process used to detect VOC's such as MTBE is called EPA method 8620 using a gas chromatographer (GC) and a mass spectrometer (MS). The sample first enters a Purge and Trap unit, it is next sent to the gas chromatographer and finally it goes to the mass spectrometer. The results are sent to a computer where the data matches with predetermined 'fingerprints' to determine the compounds and quantities. Though we were not able to do the testing ourselves, we fully understand the technical details involved with the equipment used to test.</p> <p><b>Results:</b> We received the results from the two labs, according to them the sample from Canyon Lake contained 5ppb and each of the samples from Lake Elsinore came back 1.3(north point) and 2.2 ppb(launch ramp). The results came back the same from both labs.</p> <p><b>Conclusion/Discussion:</b> Our hypothesis has been proven correct. Research shows that while 5ppb is a California secondary standard, it only causes problems with the taste and smell of the water but does not appear to pose any health hazards to the population of The City of Lake Elsinore or its wildlife.</p>	
<p><b>Summary Statement</b> (In one sentence, state what your project is about.)          Living on the shores of two lakes, one for drinking, the other for recreation, we pondered whether MTBE has contaminated our drinking and recreational water and if it had, was it in quantities high enough to cause noticeably adverse effects.</p>	
<p><b>Help Received in Doing Project</b> (e.g. Mother helped type report; Neighbor helped wire board; Used lab equipment at university X under the supervision of Dr. Y; Participant in NSF Young Scholars Program) See Display Regulation #8 on page 4.          Mike Shelton and Jack Northington (WCAS) provided free testing. ES Babcock &amp; Sons also provided us with free testing. We interviewed Mary Brown, Ken Marshall, Bart Koch, Heidi Goodwin. Parents Drove us to interviews and Labs.EVMWD provided us with weekly levels of MTBE in Canyon Lake.</p>	