



# CALIFORNIA SCIENCE & ENGINEERING FAIR

## 2018 PROJECT SUMMARY

<b>Name(s)</b> <b>Kastine Hiltman; Madison Perkins</b>	<b>Project Number</b> <b>S1111</b>
<b>Project Title</b> <b>Backyard Brew</b>	
<b>Objectives/Goals</b> The object of this study is to determine if potable water was not available could you use materials in a common backyard to filter bacteriological and suspended contaminates from raw water to make it safe to consume. Potable water standards used for this experiment are total coliform <1.0 CFU/100 ml and turbidity < 5.0 ntu.	
<b>Abstract</b> <b>Methods/Materials</b> A premeasured turbidity and coliform of raw water was poured over 8 backyard materials (rubber bark, woof chips, coal, pea gravel, sand, granite rock, lava rock and pine needles). The effluent from each filter media was collected. Turbidity was measured using a turbidimeter to determine suspended contaminant removal and 24 hour Idexx colilert tests were ran to determine bacteriological removal. Each filter media test was ran ten times and an average turbidity and coliform were recorded.	
<b>Results</b> The test results indicate that coal had the best turbidity removal rate of 37% and pea gravel had the best coliform removal of 45%. Sand had the best overall contaminants removal (turbidity and bacteria) than any other filter media. None of the filter media samples came close to meeting potable drinking water standards.	
<b>Conclusions/Discussion</b> Water treatment is complicated process that can not just be replicated at home. There is a vast array of different contaminants in the water and there is not a specific filter media that can remove them all. Most important aspect of potable water is coliform removal.	
<b>Summary Statement</b> If potable water was not available could you use materials in a common backyard to filter bacteriological and suspended contaminates from raw water to make it safe to consume.	
<b>Help Received</b> My dad demonstrated the proper lab technique in setup and reading Idexx colilert tests. City of Fairfield allowed laboratory access and provided testing equipment.	