



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

<b>Your Name</b> (List all student names if multiple authors.) <b>Andrew S. Rusch</b>	<b>Science Fair Use Only</b>  <h1 style="margin: 0;">J0823</h1>
<b>Project Title</b> (Limit: 120 characters. Those beyond 120 will be ignored. See pg. 9) <b>Reducing the Turbidity of Storm Water Effluent Using Different Types of Filter Media</b>	<b>Division</b> <u>X</u> <b>Junior (6-8)</b> _ <b>Senior (9-12)</b>
<b>Preferred Category</b> (See page 5 for descriptions.) <b>8 - Environmental Engineering</b>	
<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><b>Objective:</b> The objective of my project is to determine the best way of reducing storm water turbidity using different types of filter media. I believe the combination of sand and alum will reduce the turbidity of the water the greatest.</p> <p><b>Materials and Methods:</b> I constructed a filtering apparatus made of two inch diameter PVC pipe. I collected turbid creek water from the local creek, and I bought my filtering media at the local grocery and fish stores. The filtering media I used were charcoal, gravel, cellulose, sand, sand/alum, sand/charcoal, and sand/charcoal/alum. I tested the turbid storm water three times before (control) and three times after I poured it through the filter media that I placed in the pipe apparatus. I cleaned out the pipe, filled it with the same media, and reran the test for test two. I followed this procedure for each type of filter media. I recorded all of my data onto a data table and then graphed it.</p> <p><b>Results:</b> The most effective filtering media was the combination of sand and alum, which reduced turbidity by more than 99%. The sand/charcoal/alum combination was second best, reducing the turbidity a little more than 98%. Sand alone was also a very effective filter media due to its small grain size and large surface area; it reduced the turbidity 89%. Charcoal is an adsorbent (particles adsorb or stick to it) so I was surprised that the charcoal filter actually increased the turbidity of the storm water. I discovered that charcoal flaked off and caused the water to be more turbid. In all cases, when alum was added to the filter media, the removal efficiencies improved.</p> <p><b>Conclusion:</b> Yes, my results supported my hypothesis and I was able to obtain my objective. Alum was able to form a precipitate with the suspended solids and the sand was able to trap the precipitate. I think my information could help in the reduction of storm water turbidity/pollution when designing a filtration system to clean storm water. My results show alum and sand would be the best filtration media to clean the turbid water. My experiment did not analyze how these systems performed over time. It would be interesting to assess the long-term effectiveness of the different types of filter media.</p>	
<b>Summary Statement</b> (In one sentence, state what your project is about.) I tried to reduce the turbidity of storm water by passing the turbid water through a filtering apparatus filled with different types of filter media.	
<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. Mother and Father edited my report, bought materials, helped me construct filtering apparatus, Mrs. Vodraska supplied a beaker, and Father's friend loaned us a turbidity meter.	