CONAGUA Inspectors for all of Guanajuato

7

18,000+

3,000+

INDEPENDENCE BASIN

GUANAJUATO STATE

SAN FELIPE
SAN DIEGO DE LA UNION
SAN LUIS DE LA PAZ
SAN MIGUEL DE ALLENDE
SAN JOSE ITURBIDE
DOCTOR MORA
Broccoli Production

Average: 285 L/Kilo

Guanajuato: 1,500 L/Kilo
Declining water levels

Rate of Decline: 2-10m/year

1950s
5-10m

2000s
200m
Current Water Situation
Water Sources and Supply
Promoting healthier more prosperous lives through practical sustainable solutions.
Caminos de Agua
Ceramic Water Filter System
Quality of well water

<table>
<thead>
<tr>
<th>Contaminant</th>
<th>Units</th>
<th>WHO Guideline</th>
<th>San Antonio</th>
<th>% Above WHO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoride</td>
<td>mg/L</td>
<td>1.5</td>
<td>23.4</td>
<td>1,560%</td>
</tr>
<tr>
<td>Arsenic</td>
<td>µg/L</td>
<td>10*</td>
<td>72.7</td>
<td>727%</td>
</tr>
</tbody>
</table>
Fluoride Contamination in Community Wells of the Alta Río Laja and Laguna Seca Sub-basins

International (WHO) and Mexican Norm for Fluoride (1.5 mg/L)
Arsenic Contamination in Community Wells of the Alta Río Laja and Laguna Seca Sub-basins

WHO Recommendation (0.010 mg/L or 10 µg/L)

Norma Mexicana de Arsénico (0.025 mg/L)
Fluoride Removal Comparison: NIU Laboratory Results of Caminos Bone Chars

3g BC / 40ml fluorinated water (initial starting concentration 9.63 - 9.75 mg/L), mixed 3x, 24hrs

![Graph showing the percentage absorption of fluoride vs. burn temperature for different types of bone chars with various burn times.](graph.png)
Effect of contact time

These Caminos de Agua absorption tests also show the importance of contact time on Fluoride absorption.

**Effect of Bone Type and Contact Time during Filtration on Fluoride Absorption Capacities of Bone Char Filters (500°C burn temperature, 2 hour burn time) - Caminos de Agua Tests**
Comparison with commercially-bought char

• The bone chars produced by Caminos de Agua and tested by NIU (under lab conditions) had an average Fluoride adsorption of 96.4%.

• This is compared to an average adsorption using commercially-available bone char bought online, tested under the same conditions, of just 76.4%.
Effect of using real community water

<table>
<thead>
<tr>
<th>Fluoride adsorption percentage (500°C at 2 hours, 24 hour contact time)</th>
<th>NIU</th>
<th>CDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cow bones</td>
<td>98.5%</td>
<td>83.7%</td>
</tr>
<tr>
<td>Pig bones</td>
<td>99.8%</td>
<td>74.1%</td>
</tr>
<tr>
<td>Chicken Bones</td>
<td>96.3%</td>
<td>35.2%</td>
</tr>
</tbody>
</table>
Retort containing animal bones

Combustion Chamber

Fuel Chamber filled with wood chunks
Bone Char Produced in Two TLUD-K Burns
Promoting healthier more prosperous lives through practical sustainable solutions.