



Clean Water



Healthy Families

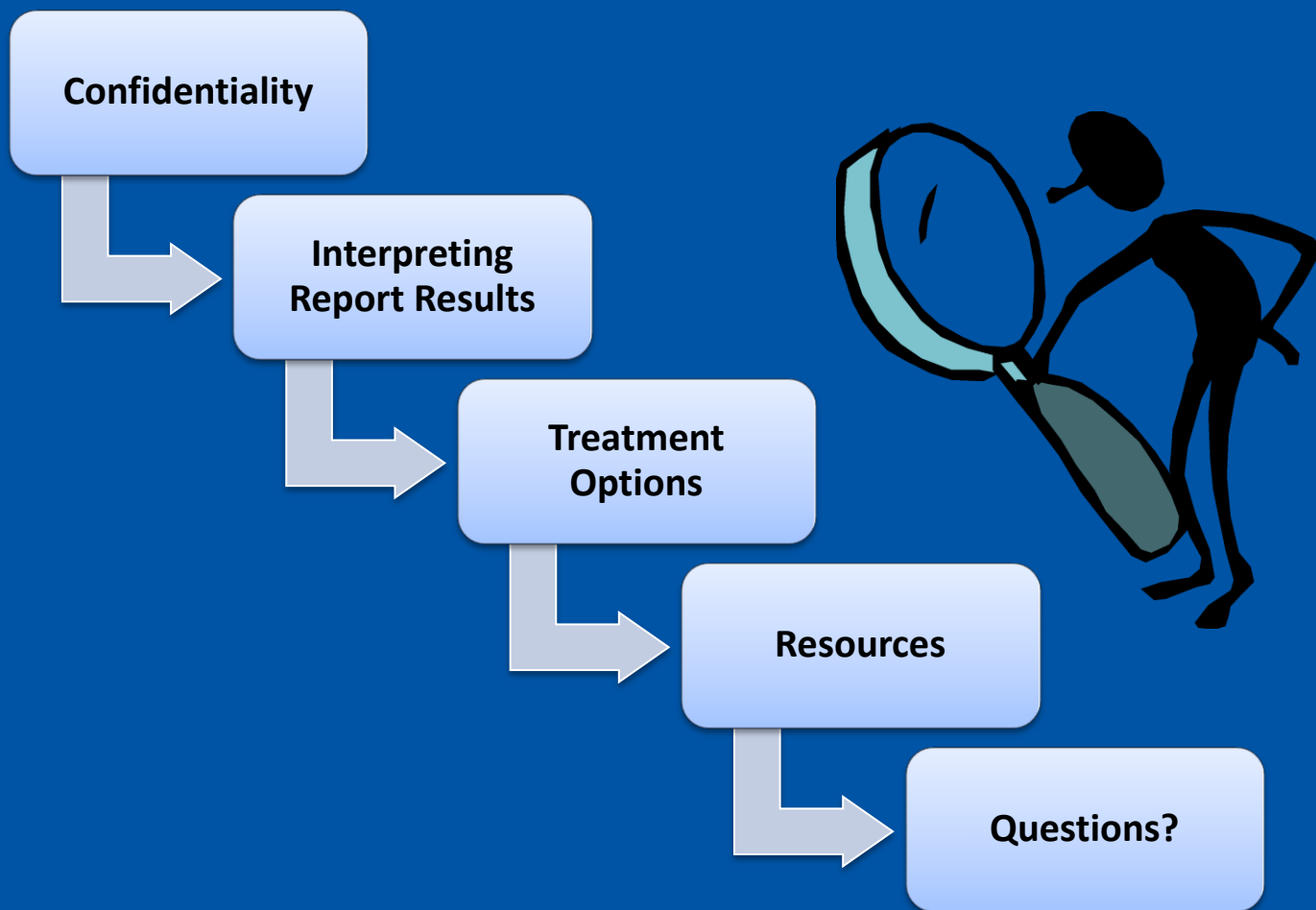


*Learn about how Cook Inletkeeper  
can help you ensure clean drinking  
water for you and your family.*

# UNDERSTANDING YOUR WATER TEST RESULTS



# Presentation Outline



# Water Test Results are



Individual meeting can be scheduled with Inletkeeper staff.  
Just email or call us.

Sharing your results with Inletkeeper to get help with  
interpreting them DOES NOT allow us to disclose the data  
to others.

If you wish to share the data with Inletkeeper, and allow us  
to use the data in maps and in discussions with other  
agencies, please fill out and sign our Data Use Agreement.



# Report Results – Case Narrative

## Case Narrative

*Analytica Alaska Inc.*

*Work Order: A1210044*

Samples were prepared and analyzed according to EPA or equivalent methods outlined in the following references:

Methods for the Determination of Metals in Environmental Samples, EPA/600/R-94/111, May 1994.

Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998.

### SAMPLE RECEIPT:

One (1) sample was received on 10/3/2012 10:22:00 AM, at a temperature of 3.5°C, at Analytica-Anchorage. The sample was received in good condition and in order per chain of custody.

The sample was transferred for metals analysis to Analytica Environmental Laboratories (AEL), 12189 Pennsylvania St., Thornton, Colorado 80241, where it was received at a temperature of 2.6°C, in good condition and in order per chain of custody on 10/5/2012.

### REVIEW FOR COMPLIANCE WITH ANALYTICA QA PLAN

A summary of our review is shown below.

All analytical results contained in this report have been reviewed under Analytica's internal quality assurance and quality control program. Any deviations in quality control parameters for specific analyses are noted in the following text. A complete quality assurance report, including laboratory control, matrix spike, and sample duplicate recoveries is kept on file in our office and is available upon request.

All method specifications were met for the following tests, unless otherwise noted:

Test Method: 200.7 – Metals by ICP – Family Well Water III – Drinking Water

Test Method: 200.8 – Metals by ICP/MS – Family Well Water (All – Drinking Water

Test Method: 200.8 – Metals by ICP/MS – Pb Cu First Draw – Drinking Water

Test Method: Calcium Carbonate Saturation – Langelier Index – Drinking Water

Test Method: Hardness, Hardness by Calculation – Total Hardness – Drinking Water

Test Method: SM 2320B – Total Alkalinity – Drinking Water

Test Method: SM2540C – Total Dissolved Solids dried at 180°C – TDS – Drinking Water

Test Method: SM9223B-PA – Coliforms in DW – Drinking Water

Test Method: SM4500-H-B Electrometric pH Method – pH – Drinking Water



# Report Results – Case Narrative cont'd

## Case Narrative

*Analytica Alaska Inc.*

*Work Order: A1210044*

*(continued)*

### HOLDING TIMES:

pH is a field test requiring immediate analysis. This analysis was performed as soon as possible upon laboratory receipt.

### HOLD TIMES MISSED:

Sample Guest Bathroom Sink, A1210044-01C

Sampled: 10/3/2012 5:45:00 AM, Prepped: 10/3/2012 3:05:00 PM

Sampled: 10/3/2012 5:45:00 AM, Analyzed: 10/3/2012 3:05:00 PM

Regulatory hold time: 0 Hrs

Test Method: SM4500-NO3E - Nitrogen (Nitrate), Cadmium Reduction Method - Nitrate+Nitrite pres - Drinking Water

Comments: Analytica-Anchorage (AK00969) is currently provisionally certified by the ADEC for Nitrate+Nitrite by SM4500-NO3E. The attached data may be used for compliance purposes.




# Report Results – Abbreviations



Cook Inletkeeper



Client Sample ID: Guest Bathroom Sink  
Sampling Location:   
Client Project:  
Sample Matrix: Drinking Water  
COC #:  
PWS#:  
Residual Chlorine:  
Comments:

Analytica Anchorage  
4307 Arctic Boulevard  
Anchorage, AK 99503  
Phone: 907-258-2155  
Fax: 907-258-6634

Report Date: 10/17/2012  
Receipt Date: 10/3/2012  
Sample Date: 10/3/2012  
Sample Time: 5:45:00AM  
Collected By: MP

## Flag Definitions:

MRL = Method Reporting Limit  
MCL = Maximum Contaminant Limit  
B = Present also in Method Blank  
H = Exceeds Regulatory Limit  
M = Matrix Interference  
J = Estimated Value  
D = Lost to Dilution  
\*\* = RL higher than MCL; target not detected  
TNC = Too Numerous to Count - result rejected  
CF = Confluent Growth - result rejected  
TCNG = Turbid Culture No Growth - rejected



# Maximum Contaminant Limits

## PRIMARY

Potential adverse health effects – acute or chronic.

## SECONDARY

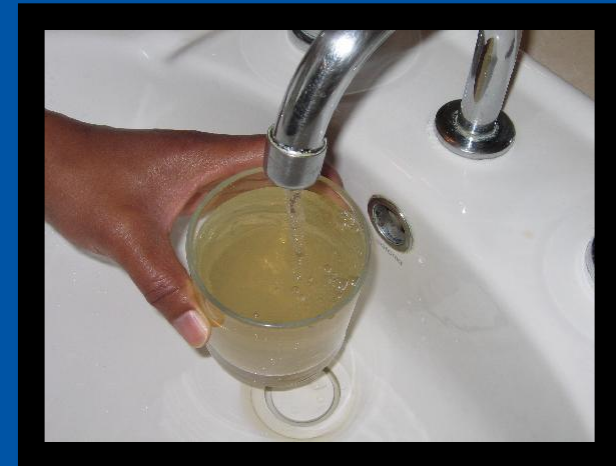
Can cause an unpleasant odor, taste, or color, or cause appliances to malfunction.

## BOTH

Some contaminants have a Primary MCL and a Secondary MCL.

## NIETHER

Some contaminants are included on a candidate list, which the EPA periodically prioritizes to determine research and data collection efforts which may one day lead to regulation. Other criteria are not health concerns themselves, but may lead to other problems.



# Maximum Contaminant Limits

EPA List of all Primary and Secondary MCLs

- <http://water.epa.gov/drink/contaminants/index.cfm>

The EPA only requires testing and enforcement of these standards for *public* water systems, NOT private wells, cisterns, springs, etc. Your results are not required to meet EPA standards, but they are still great standards to use when assessing your household's water for health and aesthetics.



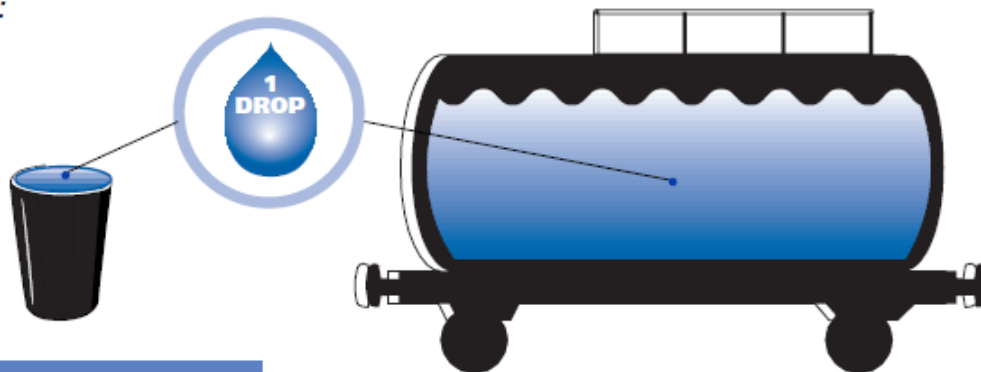
# Report Results – Units

mg/L = milligram per liter of water = parts per **million** (ppm)

µg/L = microgram per liter of water = parts per **billion** (ppb)

Some criteria were measured on a relative scale:  
pH and Langelier Index

*For example:*



**1 part per million =**  
**one drop** in a tall kitchen  
trash can filled with water

**1 part per billion =**  
**one drop** in a railroad tanker car filled with water

# Report Results – Results Table

1

2

3

4

5

6

| Analysis Method                                |              |       |       |        |      |             |            |               |         |
|--|--------------|-------|-------|--------|------|-------------|------------|---------------|---------|
| Parameter                                      | Result       | Units | Flags | MRL    | MCL  | Prep Method | Prep Date  | Analysis Date | Analyst |
| 4500-H-B/4500-H-B (Aqueous) - pH               |              |       |       |        |      |             |            |               |         |
| pH   | 7.0          | pH    |       | 0.0    |      | 4500-H-B    | 10/3/2012  | 10/3/2012     | MC      |
| 2540C/2540C (Aqueous) - TDS                    |              |       |       |        |      |             |            |               |         |
| Total Dissolved Solids                         | 83.8         | mg/L  |       | 20     | 500  | 2540C       | 10/9/2012  | 10/9/2012     | MC      |
| Lab#:  | A1210044-01D |       |       |        |      |             |            |               |         |
| Analysis Method                                |              |       |       |        |      |             |            |               |         |
| Parameter                                      | Result       | Units | Flags | MRL    | MCL  | Prep Method | Prep Date  | Analysis Date | Analyst |
| 2340B/2340B (Aqueous) - Total Hardness         |              |       |       |        |      |             |            |               |         |
| Hardness, Total                                | 59           | mg/L  |       | 1.0    |      | 2340B       | 10/15/2012 | 10/15/2012    | TE      |
| 200.7/200.7 (Aqueous) - Family Well Water III  |              |       |       |        |      |             |            |               |         |
| Calcium  | 19.0         | mg/L  |       | 0.10   |      | 200.7       | 10/11/2012 | 10/11/2012    | TE      |
| Iron   | <MRL         | mg/L  |       | 0.050  | 0.3  | 200.7       | 10/11/2012 | 10/11/2012    | TE      |
| Magnesium                                      | 2.87         | mg/L  |       | 0.10   |      | 200.7       | 10/11/2012 | 10/11/2012    | TE      |
| Manganese                                      | 0.0119       | mg/L  |       | 0.0100 | 0.05 | 200.7       | 10/11/2012 | 10/11/2012    | TE      |
| Sodium   | 3.78         | mg/L  |       | 3.0    |      | 200.7       | 10/11/2012 | 10/11/2012    | TE      |
| 200.8/200.8 (Aqueous) - Family Well Water (All |              |       |       |        |      |             |            |               |         |
| Arsenic  | 0.171        | ug/L  |       | 0.15   | 10   | 200.8       | 10/10/2012 | 10/10/2012    | RM      |
| Lab#:  | A1210044-01E |       |       |        |      |             |            |               |         |





Cook Inletkeeper



Client Sample ID: Guest Bathroom Sink  
Sampling Location: [Redacted]  
Client Project: [Redacted]  
Sample Matrix: [Redacted]  
COC #: [Redacted]  
PWS#: [Redacted]  
Residual Chlorine: [Redacted]  
Comments: [Redacted]

Analytica Anchorage  
4307 Arctic Boulevard  
Anchorage, AK 99503  
Phone: 907-258-2155  
Fax: 907-258-6634

Report Date: 10/17/2012  
Receipt Date: 10/3/2012  
Sample Date: 10/3/2012  
Sample Time: 5:45:00AM  
Collected By: MP

Flag Definitions:

MRL = Method Reporting Limit  
MCL = Maximum Contaminant Limit  
B = Present also in Method Blank  
H = Exceeds Regulatory Limit  
M = Matrix Interference  
J = Estimated Value  
D = Lost to Dilution  
\*\* = RL higher than MCL; target not detected  
TNC = Too Numerous to Count - result rejected  
CF = Confluent Growth - result rejected  
TCNG = Turbid Culture No Growth - rejected

Pay attention to any Flags listed in this column. An 'H' means that an EPA recommended MCL has been exceeded.

Not all parameters have an EPA recommended MCL. If the parameter has one, it will be listed here.

Each test has a specific analysis method, which enables the lab to assure quality control and quality assurance.

| Analysis Method<br>Parameter                   | Result | Units | Flags | MRL    | MCL  | Prep<br>Method    | Prep<br>Date | Analysis<br>Date | Analyst |
|--|--------|-------|-------|--------|--|-------------------|--------------|------------------|---------|
| 4500-H-B/4500-H-B (Aqueous) - pH               |        |       |       |        | Test was conducted by: Analytica - Anchorage |                   |              |                  |         |
| pH   | 7.0    | pH    |       | 0.0    |  | 4500-H-B10/3/2012 | 10/3/2012    | MC               |         |
| 2540C/2540C (Aqueous) - TDS                    |        |       |       |        | Test was conducted by: Analytica - Anchorage |                   |              |                  |         |
| Total Dissolved Solids                         | 83.8   | mg/L  |       | 20     | 500  | 2540C             | 10/9/2012    | 10/9/2012        | MC      |
| Lab#: A1210044-01D                             |        |       |       |        |  |                   |              |                  |         |
| Analysis Method<br>Parameter                   | Result | Units | Flags | MRL    | MCL  | Prep<br>Method    | Prep<br>Date | Analysis<br>Date | Analyst |
| 2340B/2340B (Aqueous) - Total Hardness         |        |       |       |        | Test was conducted by: Analytica - Thornton  |                   |              |                  |         |
| Hardness, Total                                | 59     | mg/L  |       | 1.0    |  | 2340B             | 10/15/2012   | 10/15/2012       | TE      |
| 200.7/200.7 (Aqueous) - Family Well Water III  |        |       |       |        | Test was conducted by: Analytica - Thornton  |                   |              |                  |         |
| Calcium  | 19.0   | mg/L  |       | 0.10   |  | 200.7             | 10/11/2012   | 10/11/2012       | TE      |
| Iron   | <MRL   | mg/L  |       | 0.050  | 0.3  | 200.7             | 10/11/2012   | 10/11/2012       | TE      |
| Magnesium                                      | 2.87   | mg/L  |       | 0.10   |  | 200.7             | 10/11/2012   | 10/11/2012       | TE      |
| Manganese                                      | 0.0119 | mg/L  |       | 0.0100 | 0.05   | 200.7             | 10/11/2012   | 10/11/2012       | TE      |
| Sodium   | 3.78   | mg/L  |       | 3.0    |  | 200.7             | 10/11/2012   | 10/11/2012       | TE      |
| 200.8/200.8 (Aqueous) - Family Well Water (All |        |       |       |        | Test was conducted by: Analytica - Thornton  |                   |              |                  |         |
| Arsenic  | 0.171  | ug/L  |       | 0.15   | 10   | 200.8             | 10/10/2012   | 10/10/2012       | RM      |
| Lab#: A1210044-01E                             |        |       |       |        |  |                   |              |                  |         |

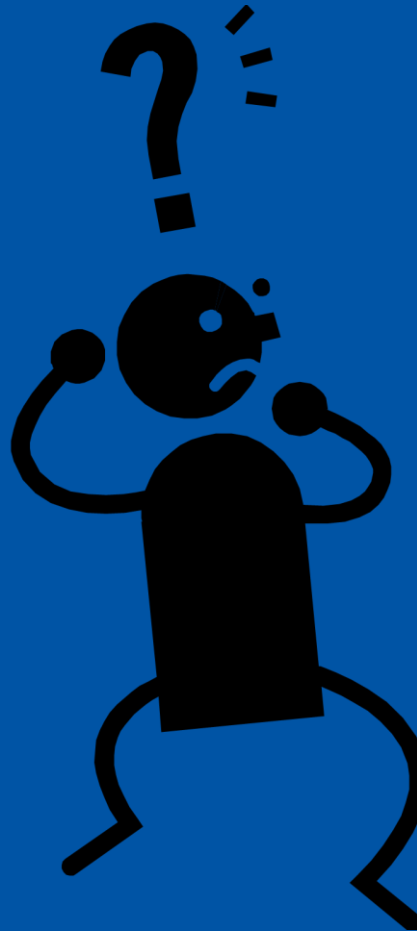
The result for Iron was less than the MRL. This doesn't mean that there was zero Iron, just that it was less than the test method could detect, 0.050 mg/L.

Arsenic is measured in micrograms per liter.

The MRL shows the lowest amount of contaminant present that the lab equipment or method used in the lab could accurately detect.

The MCL for Manganese is 0.05 mg/L. This test only found 0.0119 mg/L, so the amount found was less than the EPA set as the limit. Good!

# What do your results mean?



# What do your results mean?

| Test            | Possible Results       | Interpretation   | Suggestions & Treatment Options  |
|-----------------|------------------------|--|--|
| Bacteria        | PASS                   | Okay   |  |
|                 | FAIL                   | <i>Health risk!</i> Retest and boil water until problem is treated | (chlorination, UV Filters)   |
| Nitrate-Nitrite | 0 – 2                  | Okay   |  |
|                 | 2 – 10 mg/L            | Possible contamination   | Continue annual testing, more often if there are infants in the house                                      |
|                 | More than 10 mg/L      | <i>Health risk!</i> Especially for infants < 1 year                | Do not boil water! (distillation, filtration, reverse osmosis)   |
| Langelier Index | Less than -2.5         | High corrosion potential   | Treatment suggested (calcite system), especially with lead/copper pipes – suggested tests for metals.      |
|                 | -2.5 to -0.5           | Moderate corrosion potential                                       | Possible treatment (calcite system) suggested – suggest tests for metals                                   |
|                 | -0.5 to 0.5            | Okay   |  |
|                 | 0.5 to 2.5             | Moderate scaling potential   | Potential for build-up in plumbing and flow reduction. Consider treatment (softener)                       |
|                 | More than 2.5          | High scaling potential   | High potential for build-up in plumbing and flow reduction. Consider treatment (softener)                  |
| Alkalinity      | Less than 100 mg/L     | Corrosion potential  | If pH is less than 6.5, potential for pipe corrosion and release of metals from pipes. (calcite system)    |
|                 | 100 to 200 mg/L        | Okay   |  |
|                 | More than 200 mg/L     | Scaling potential  | Potential for build-up in plumbing and flow reduction. (softener)  |
| pH              | 6.5 to 8.5             | Okay   |  |
|                 | Below 6.5 or above 8.5 | Low pH indicates higher corrosion potential                        | Compare with alkalinity results and Langelier Index to assess overall corrosion potential (calcite system) |

# What do your results mean?

| Test    | Possible Results    | Interpretation   | Suggestions & Treatment Options   |
|---------|---------------------|--|---|
| Sodium  | Any value           | Can range from 0.4 to 1900 mg/L. Okay, depending on dietary restrictions | People on low sodium diets for cardiovascular health should pay attention to the sodium content of their drinking water. (reverse osmosis)  |
| Arsenic | < MRL               | Okay   |   |
|         | 0.15 to 10 ug/L     | Okay   | Consider retesting annually if above 8 ug/L   |
|         | More than 10 ug/L   | <i>Health risk!</i>  | (distillation, filtration, reverse osmosis, with added absorption material if Arsenic V is present)   |
| Copper  | Less than 1000 ug/L | Okay   | Consider retesting if water is also corrosive   |
|         | More than 1000 ug/L | <i>Health risk!</i>  | Run water for 15 to 30 seconds before use. Only use cold water for cooking and drinking. Address the presence of copper in plumbing and water corrosivity. (distillation, filtration, reverse osmosis)        |
| Lead    | Less than 15 ug/L   | Okay   | If water is corrosive, consider testing annually if result is 12 or more  |
|         | More than 15 ug/L   | <i>Health risk!</i>  | Run water for 15 to 30 seconds before use. Only use cold water for cooking and drinking. Address the presence of lead in plumbing and water corrosivity (low pH). (distillation, filtration, reverse osmosis) |

# What do your results mean?

| Test                   | Possible Results    | Interpretation   | Suggestions & Treatment Options  |
|------------------------|---------------------|--|--|
| Total Dissolved Solids | Less than 500 mg/L  | Okay   |  |
|                        | More than 500 mg/L  | Can result in poor taste, staining, coloration, and diarrhea in people not accustomed to the water | Results in hard water. (softener or reverse osmosis)                             |
| Hardness               | Less than 50 mg/L   | Soft water - corrosion potential   | May need treatment for corrosion. (calcite system)                               |
|                        | 50 to 150 mg/L      | Okay   |  |
|                        | More than 150 mg/L  | Hard water   | Potential for scaling. (softener)  |
| Calcium                | Any value           | Okay   | High amounts of calcium, together with magnesium, lead to hard water. (softener) |
| Iron                   | Less than 0.3 mg/L  | Okay   |  |
|                        | More than 0.3 mg/L  | Can result in staining and poor taste  | (filtration or reverse osmosis)  |
| Magnesium              | Any value           | Okay   | High amounts of magnesium, together with calcium, lead to hard water. (softener) |
| Manganese              | Less than 0.05 mg/L | Okay   |  |
|                        | More than 0.05 mg/L | Possible black-brown staining, bitter taste  | (filtration or softener)   |



My result for \_\_\_\_\_ was high!

## QUESTIONS TO ASK

Is it a health risk?

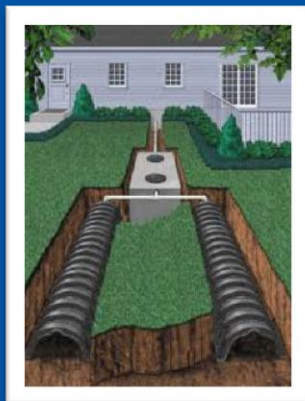
Are there aesthetic problems?

What is causing the high level?

What treatment options are there?



# Treatment System Considerations



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Is the treatment system independently certified by NSF International or the Water Quality Association?

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Where will the water treatment system go?  
Point-of-use or point-of-entry?  
Whole house or just drinking water?

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Can non-treatment solutions address the problem (e.g., replacing septic system, repairing well cap, etc.)?

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## Filter

Activated carbon bonds with and traps contaminants. Effective at improving the taste of water, and may reduce lead, copper, and other contaminants.

Neutralizing filters use crushed limestone, magnesia or other mixture. As water passes through, the filter neutralizes the excess “acid” and results in the partial dissolution of the media, increasing the hardness of the water and raising the pH.

## Ion Exchange

Water softeners use a ion exchange resin, regenerated with sodium chloride or potassium chloride, to reduce the amount of hardness (calcium, magnesium) in the water.

The hardness ions in the water are replaced with sodium or potassium ions.

## Reverse Osmosis

Reverse osmosis units force water through a semipermeable membrane under pressure, leaving contaminants behind.

They are effective in eliminating all disease causing organisms and most chemical contaminants to be removed.

## Distillation

Distillers heat water to the boiling point, and then collect the water vapor as it condenses, killing disease-causing microbes and leaving most chemical contaminants behind.

Removes nitrates, bacteria, sodium, hardness, dissolved solids, most organic compounds, and heavy metals.

Other “treatment” options include constructing a new well, connecting to a public utility, or using bottled water.



## Filter

Filters need to be replaced periodically, can be expensive

Point-of-use or point-of entry are both common

## Ion Exchange

Can add sodium and salty taste to water

Typically point-of-entry (whole house)

## Reverse Osmosis

Expensive

Typically point-of-use (under sink)

Wastes water

## Distillation

Expensive

Typically point-of-use (under sink)

Slow



# Local Water Treatment Resources

*Cook Inletkeeper does not endorse any organization, business, product, or water treatment action.*

HOMER - Alaska Quality Water Conditioning  
[www.akqualitywater.com](http://www.akqualitywater.com)  
235-5116 or toll free 1-866-269-4426

KENAI - Kenai Peninsula Water Treatment LLC  
<http://kpwtllc.com/index.html>  
283-5832

KENAI - Water Systems and Service Company  
776-8066

STERLING - Alaska's H2O Pros  
262-8711



# Additional Resources

|   |   |
|---|---|
| Water Systems Council                           | <ul style="list-style-type: none"><li>• <a href="http://www.watersystemscouncil.org/">http://www.watersystemscouncil.org/</a></li></ul>   |
| EPA   | <ul style="list-style-type: none"><li>• <b>Safe Drinking Water Hotline 1-800-426-4791</b></li><li>• <a href="http://water.epa.gov/drink/index.cfm">http://water.epa.gov/drink/index.cfm</a></li><li>• <a href="http://www.epa.gov/privatewells/pdfs/household_wells.pdf">http://www.epa.gov/privatewells/pdfs/household_wells.pdf</a></li><li>• <a href="http://water.epa.gov/drink/guide/upload/book_waterontap_full.pdf">http://water.epa.gov/drink/guide/upload/book_waterontap_full.pdf</a></li></ul> |
| Alaska Department of Environmental Conservation | <ul style="list-style-type: none"><li>• <a href="http://www.dec.state.ak.us/EH/dw/index.htm">http://www.dec.state.ak.us/EH/dw/index.htm</a></li></ul>   |
| UAF Cooperative Extension Service               | <ul style="list-style-type: none"><li>• <a href="http://www.uaf.edu/ces/nrcd/water/">http://www.uaf.edu/ces/nrcd/water/</a></li></ul>   |
| National Sanitation Foundation                  | <ul style="list-style-type: none"><li>• <a href="http://www.nsf.org">www.nsf.org</a></li></ul>  |
| American Water Works Association                | <ul style="list-style-type: none"><li>• <a href="http://www.awwa.org">www.awwa.org</a></li></ul>  |
| Water Quality Association                       | <ul style="list-style-type: none"><li>• <a href="http://www.wqa.org">www.wqa.org</a></li></ul>  |
| Cook Inletkeeper                                | <ul style="list-style-type: none"><li>• <a href="http://inletkeeper.org/SAFEDRINKINGWATER">http://inletkeeper.org/SAFEDRINKINGWATER</a></li></ul>   |



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907.235.4068

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[www.inletkeeper.org/safedrinkingwater](http://www.inletkeeper.org/safedrinkingwater)



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**[www.inletkeeper.org](http://www.inletkeeper.org)**

Protecting Alaska's Cook Inlet watershed and the life it sustains.

