



Four Corner States Biomonitoring Consortium



UTAH DEPARTMENT OF
HEALTH

Do you and your family use private well drinking water?

You can be eligible to receive free testing to ensure you and your family stay healthy.

Why is this important?

Understand what chemicals you may be exposed to in your community.

Metals and arsenic exposure in humans can lead to serious health issues if reach above a certain level.

Utah has a long history in the mining industry, increasing likelihood for metals in water.

Previous studies have found high levels of arsenic in well water in small communities in Utah.



What is Biomonitoring?

A tool used to collect information on persons' exposure to potential environmental hazards.

Urine samples are collected for each person and a water sample is collected from the home to test for heavy metals and arsenic.

Anonymous data is used to make decisions on both the local and state level to improve health in our communities.



How can I get involved?

If you use private well water, you can get your free and confidential test.

You will receive a free confidential report of contaminants in your well water.

Participate today and join the community in assuring safe drinking water for you and your family.



Interested in participating?

Contact Taylor at the Utah Department of Health
taylorhampton@utah.gov or 801.538.6596



**State-based Public Health Laboratory Biomonitoring Program for the Four Corners States
(AZ,CO, NM, UT) Biomonitoring Consortium**

Confidentiality Agreement

This agreement applies to study personnel who are working under the study project lead: Dr. Sanwat Chaudhuri, Science Advisor, Unified State Laboratories: Public Health, Utah Department of Health.

Confidentiality is a general standard of professional conduct. By signing this agreement any person with authorized access to personal identifying information agrees not to discuss information with or provide copies of reports about a subject, regardless of how or where acquired, to family members, friends, professional colleagues, other employees, other clients or any other person unless such person has been authorized to have access to this information.

A breach of confidentiality is defined as the release of personal identifying information (e.g. name, address, date of birth, telephone number, geographic coordinates of a residence, or other information that could reasonably lead to personal identification) and either:

1. test results, or the fact that a test has been performed, or that a person has participated in the research project;

or

2. other personal information (such as records of discussions about possible toxic exposures)

to any person not authorized to have access to that information by the custodian of the records in question or by the project principal investigator. A breach includes the intentional or unintentional provision of electronic records with the above information to a person not authorized to receive these data.

Study personnel or collaborators who are not employees of Utah Department of Health (UDOH or not directly supervised by UDOH with access to confidential records and who are suspected of breaching confidentiality will lose their privileged status, which allows them access to the data, until an investigation of the matter is completed by the principal investigator. If the principal investigator determines there is no evidence or insufficient evidence of a breach of confidentiality, the concerned employee or collaborator will immediately have his/her privileged status reinstated. If the principal investigator determines there is evidence of a breach of confidentiality, the employee or collaborator will permanently lose their privileged status. An employee may also be subject to corrective or disciplinary action including termination and may also be subject to criminal prosecution.

I understand that laboratory and epidemiologic information that includes personally identifying data is considered confidential. I agree that I will not reveal such confidential information, regardless of how or



where acquired, to family members, friends, professional colleagues, other employees, other clients, or any other person unless such person has been authorized to have access to that information.

I further understand this agreement shall be in force during any period of authorized access to the records for this study and even after my authorized status has been terminated and that unauthorized use or disclosure of any confidential information is a breach of the terms of privileged access to the data for this study.

I have read and understand the above information.

DATE: _____ NAME: _____

(Please Print)

(Signature)

DATE: _____ WITNESS: _____

(Please Print)



**State-based Public Health Laboratory Biomonitoring Program for the
Four Corners States (AZ, CO, NM, UT) Biomonitoring Consortium**

Participant Eligibility Form

We are conducting a study about how you may possibly be exposed to some metals and chemicals in the Four Corner State region. There are many environmental sources of exposure to these metals and chemicals including drinking water. When you are exposed to chemicals, your body will release the chemical metabolites into your urine. We will measure the amount of those metabolites in your urine. Your results along with the results of all the other participants in the study will help us understand the extent that residents in Utah are exposed to these chemicals. Before we include you in our study, we need to ask you a question:

1. Are you capable of providing a urine sample for the study? Yes No

Participant Consent Form

Basic Rights of Public Health Investigation Participants

Any person asked to take part as a participant in a public health investigation, or any person asked to consent to such participation on behalf of another, is entitled to receive a list of rights written in a language in which the person is fluent.

The rights below are the rights of every person who is asked to be in this public health investigation. As an investigation participant, I have the following rights:

1. To be told what the investigation is trying to find out,
2. To be told what will happen to me and whether any of the procedures, drugs, or devices is different from what would be used in standard practice,
3. To be told about the frequent and/or important risks, side effects, or discomforts of the things that will happen to me for investigation purposes,
4. To be told if I can expect any benefit from participating, and, if so, what the benefit might be.
5. To be told of other choices I have and how they may be better or worse than being in the investigation,
6. To be allowed to ask any questions concerning the investigation both before agreeing to be involved and during the course of the investigation,
7. To be told what sort of medical treatment is available if any complications arise,
8. To refuse to participate at all or to change my mind about participation after the investigation has started. This decision will not affect my right to receive the care I would receive if I were not in the investigation,
9. To receive a copy of the signed and dated consent form,
10. To be free of pressure when considering whether I wish to agree to be in the investigation.

Participant Consent Form

1. Consent for Children

When this form is completed for a child, the word “you” applies to that child and to the parents, guardian or caretaker of that child.

2. Project Description

We asked you to be part of a study. This study is about how you may be exposed to some chemicals. When you are exposed to chemicals your body will release metabolites from them into your urine. We will measure the amount of those metabolites in your urine. This will tell us how much chemical you are exposed to. Your results along with the results of all the other participants in the study will help us understand how people are exposed to those chemicals. The chemicals we are interested in checking for include: [check those that apply]:

- Heavy metal (arsenic, cadmium, lead, manganese, mercury, selenium, uranium) contaminates in private well drinking water**
Metabolites: arsenic, cadmium, lead, manganese, mercury, selenium, uranium, and creatinine
- 2,4-dichlorophenoxyacetic acid (2,4-D) containing herbicide**
Metabolite: 2,4-dichlorophenol (2,4-DCP)
- p-dichlorobenzene (p-DCB) contaminates found in disinfectants, deodorants and some kinds of pesticides**
Metabolite: 2,5-dichlorophenol (2,5-DCP)
- Phthalate contaminates in food and domestic products**
Metabolites (12): monoethyl phthalate (MEP), mono-isobutyl phthalate (MiBP), mono-n-butyl phthalate (MnBP), monobenzyl phthalate (MBzP), mono-3-carboxypropyl phthalate (MCP), mono-carboxyethyl phthalate (MCEP), mono-carboxyisononyl phthalate (MCNP), di-(2-ethylhexyl) phthalate (DEHP), mono-(2-ethylhexyl) phthalate (MEHP), mono-(2-ethyl-5-oxohexyl) phthalate (MEOHP), mono-(2-ethyl-5-hydroxyhexyl) phthalate (MEHHP), mono-(2-ethyl-5-carboxyphenyl) phthalate (MECPP)
- Pyrethroid-containing insecticides**
Metabolite: 3-phenoxybenzoic acid (3-PBA)
- Creatinine**
This metabolite is used to measure the concentration of your urine. It helps us interpret your results.

We will only test your urine for the metabolites checked above.

Our study partners are the 4-Cornors States Biomonitoring Consortium (4CSBC) and the Utah Department of Health (UDOH). The Center for Disease Control and Prevention (CDC) is paying for this study. We want to know more about how people are exposed to chemicals. That information will help us make better policies to protect your health.

Participant Consent Form

Before we include you in this study, we will ask you some questions. Those questions will help us know if you are eligible for this study. If you are selected for this study, you will be asked to:

- (1) Answer some questions about your home, work and/or play activities.
- (2) Give us a sample of your first-morning urine. You will need to follow the instructions we give you about taking samples.
- (3) Give us a sample of your water. You will need to follow the instructions we give you about taking water samples. [Cross out if not applicable].

You will not have any risk from providing us urine sample or a water sample. The cups or bottles we give you to collect the samples may have a preservative in them. The preservative is not harmful to your health.

You will not need to take any medications for this study. You will not need to stop taking any medications that you are now taking either.

Your participation is voluntary. We request that you participate in all the activities of this study. However, you may choose not to participate in any of the activities. The activities are listed in the next section.

3. Procedures

If you agree to take part in this study, we will ask you to:

- 3.1 Fill out the form on the two last pages of this consent form.
- 3.2 Answer the eligibility questions.
- 3.3 Answer the questions about your work, home and play activities. This activity will include questions about your health, habits, and activities inside, outdoor, and at work or school.
- 3.4 Give us a urine sample. For the tests to be accurate, you will need to follow the instructions we give you. Your urine sample will be tested for the metabolites listed above. You may be asked to give two samples. We will use the second urine sample to make sure our laboratory is doing the test right.
- 3.5 Store the urine sample in your refrigerator, until we pick it up.
- 3.6 Be home at the time we agree to pick up your urine sample.

4. Discomforts and Risks

We don't think you will have any discomfort or risks by participating in this study.

All of the information you give us will be kept confidential.

Participant Consent Form

We will share the results we get from analyzing your urine with you. We will not share your results with anyone else. A summary of all of the results will be shared with our partners. That summary will include counts and averages. No person will be individually identifiable.

This study may result in new knowledge about chemicals exposures in your home. That knowledge may result in some unintended consequences.

5. Benefits

We will learn more about how people are being exposed to chemicals in the environment. This will help us make better policies.

This study is designed to help us learn more about how the public is exposed to chemicals in the environment. We will use what we learn to make better policies regarding public health.

This study is not designed to treat any illnesses you may now have.

6. Source of Funding

To do this study we were given a grant. CDC is funding this study. CDC is part of the US Department of Health and Human Services. The title of the grant is "The 4 Corner States are Collaborating to Develop and Enhance Biomonitoring Capability to Assess Human Exposure in this Region." The award number is 1U88EH001153-01. The study period is from September 1, 2014 through August 31, 2019.

7. Cost to Participants

You will not have to pay to be part of this study. The results will be free to you. You will not receive any monetary incentive for being part of the study.

If you choose to follow-up with your health care provider after you get your results back, you will have to pay for that follow-up. Those costs are not covered by this study.

8. Analytical Results

After we analyze your urine, we will provide you a copy of the results. The results will be for those tests that are checked above. We will also send you a fact sheet for each test we do. The fact sheet will help you understand what your results mean. The fact sheet will also give you some suggestions to improve your health.

This study is designed to help public health understand exposure. The laboratory procedures that will be used may not be approved for diagnosis. After you get your results you may want to do some follow-up testing with your health care provider using testing methods that are approved for diagnosis. You will be responsible to set up an appointment with your health care provider for any additional testing you choose to have. You will be responsible for the costs of your appointment, testing and treatment.

Participant Consent Form

The study is designed so that the four states will work together. Each state will be able to do some of the tests but not all of the tests. Some of the urine sample you provide us may be sent to other states for testing.

Because we have a limited budget, we may choose to wait until we have a large batch of samples before doing the tests. It may be several months before you get your results back.

9. Withdrawal from Study

Taking part in this study is voluntary. You have the right to choose not to take part in this study. If you do not take part in the study, your doctor will still take care of you. You will not lose any benefits or medical care to which you are entitled. If you choose to take part, you have the right to stop at any time. If there are new findings during the study that may affect whether you want to continue to take part, you will be told about them. The study principle investigator or study director may decide to stop your participation without your permission, if he or she thinks that being in the study may cause you harm, or for any other reason. The sponsors may also stop the study at any time.

The principal investigator carrying out this study is Dr. Sanwat Chaudhuri and the project coordinator is Carrie Butler. You may ask any questions you have now. If you have questions later, you may call Dr. Chaudhuri at (801) 965-2470 or Carrie at (801) 347-6739. You may also call our office at 801-538-6191. You will be given a copy of this form to keep.

10. Confidentiality Protection

If you participate in this study, we keep your individual information confidential. The UDOH Institutional Review Board (IRB) has the right to examine your information. They do this to make sure we are doing the work properly. No one else will have the right to look at your information. The UDOH IRB will also keep your information confidential.

The information you provide us, along with the information from other participants, will be summarized into counts, rates and other statistics. We will share the summarized data with the 4CSBC. You cannot be identified through the summary information. We may use the summary data to make presentations at meeting and publish reports. You will not be identified at those meetings or in those reports.

11. Authorization

I have read this consent form about the study or it was read to me. I understand the possible risk and benefits of this study. I know that participating in this study is voluntary. I choose to participate in this study. I know I can stop participating in any or all activities of this study. I know that if I stop participating, I will still get my usual medical care. I will get to keep a copy of this consent form.

Participant Consent Form

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The rights below are the rights of every person who is asked to be in this public health investigation. As an investigation participant, I have the following rights:

1. To be told what the investigation is trying to find out,
2. To be told what will happen to me and whether any of the procedures, drugs, or devices is different from what would be used in standard practice,
3. To be told about the frequent and/or important risks, side effects, or discomforts of the things that will happen to me for investigation purposes,
4. To be told if I can expect any benefit from participating, and, if so, what the benefit might be.
5. To be told of other choices I have and how they may be better or worse than being in the investigation,
6. To be allowed to ask any questions concerning the investigation both before agreeing to be involved and during the course of the investigation,
7. To be told what sort of medical treatment is available if any complications arise,
8. To refuse to participate at all or to change my mind about participation after the investigation has started. This decision will not affect my right to receive the care I would receive if I were not in the investigation,
9. To receive a copy of the signed and dated consent form,
10. To be free of pressure when considering whether I wish to agree to be in the investigation.

Participant Consent Form

Possible Unintended Consequences

This document provides some examples of things that you might experience by participating in the Four Corners States Biomonitoring Consortium studies. These examples are not all of the possibilities. If your experiences are different from those listed here, please let us know about them.

After reviewing your laboratory results you may choose to:

- Install a water treatment system to remove metals from the water. We will send you some information about water treatment systems that are effective in removing the metals from your system. You may want to verify the results we send you with some additional testing. You will be responsible for the cost for additional testing to determine what system you need. You will be responsible for the costs to install and maintain a water treatment system.
- Connect to a public water system and stop using your well for drinking water. This may require some changes in your home plumbing and the installation of underground pipes to make the connection. You will be responsible to work with your local public water service to make this connection. You will be responsible for the costs of switching to a public water system and any plumbing that needs to be done to make that switch.
- Work with your health care provider for some additional testing and treatment. We will send you some recommendations on what kinds of additional evaluation and testing you may want to have as a follow-up. You will be responsible to set up appointments with your health care provider for any additional medical evaluation you may want to have. You will be responsible for all of the costs of testing, evaluation and treatment that you get from your health care provider.
- Change household food and water storage containers because the containers contain excessive amounts of free phthalates. We will send you some information on how to identify phthalate free containers. You will be responsible for acquiring new phthalate free containers. You will be responsible for discarding old containers.
- Change your use of personal and lawn care products and services that result in exposure to hazardous chemicals. You will be responsible for any changes in the costs of alternative products and services.
- Work with your community to change agricultural or industrial practices that are resulting in your exposure to hazardous chemicals.
- Identify and avoid high risk areas that you typically like to visit due to the use of hazardous chemicals in those areas.

This list of unintended consequences of participation in our study was prepared on December 8, 2014. This list may change as we become aware of additional consequences and add those to the list.

Participant Consent Form

Please initial all the previous pages of this consent form.

PARTICIPANT ID LABEL

I agree to participate in all activities of the study that I have initialed below:

_____ the eligibility survey, as described in Section 3.2 above,
(initial)

_____ the exposure risk questionnaire, as described in Section 3.3 above
(initial)

_____ collect, store and provide a urine sample to the study staff as described in Sections 3.4
(initial) through 3.6 above, to be analyzed for the metabolites to the environmental contaminants indicated
in Section 2.

_____ collect, store and provide an additional urine sample for laboratory quality control purposes, as
(initial) described in Section 3.7 above.

_____ collect, store and provide a water sample from the primary drinking water source in the home, to
(initial) study staff as described in Sections 2 above. The drinking water will be analyzed for
heavy metals and will be used to correlate drinking water exposure risk to the level of urinary
metal levels. (cross out if not applicable)

I have read and understand the participant consent, potential unintended consequences and participant rights.

Signature

Date

Participant Consent Form

Participant Certification

PARTICIPANT ID LABEL

Participant's Name: _____

Participant's Street Address: _____

Participant's Mailing Address (if different): _____

Participant's Phone Number: _____ Participant's DOB: ____/____/____

Participant's Email (optional): _____

Signature: _____ Date: _____

Participant, or participant's parent, guardian or caretaker

Print name of person signing: _____

Investigator Certification

Consent form explained by: _____ Date: _____

signature

Print name: _____

Exposure Assessment Survey



NAME _____

Participant ID Label

(Note to Interviewers: All of the instructions and/or questions that should be read verbatim are underlined. Instructions that are not underlined should not be read out loud to avoid confusion.)

I am going to ask you some questions about possible exposure to arsenic and other metals from drinking water, work, and other sources. Please answer the questions the best you can. Please, ask me to repeat any questions at any time. The questions will be about water you drink, food you eat, your job, hobbies and other activities, and you. This will take about 10-15 minutes.

Water Source and Consumption

First, I would like to ask you a few questions about your tap water.

1. What is your source of water at home?

- 1 Private Well Water
- 2 Public/Community Water Supply
- 3 Both Private Well Water and Community Water Supply
- 4 Shared Well
- 5 Other: _____

- 777 Don't know/Not sure
- 999 Refused

1a. Do you **currently** use treated well water for consumption? (for example: well water that is filtered or processed through reverse osmosis or other treatment method)

- 1 Yes
- 2 No

- 777 Don't know/not sure
- 999 Refused

A. If "YES", what type of filter do you use? (Mark all that apply)

- 1 Carbon filter (such as Brita or Culligan)
- 2 Reverse Osmosis (RO)
- 3 Both, carbon and RO
- 4 Water softener
- 5 Other, specify: _____

- 777 Don't know/not sure
- 999 Refused

B. Do you replace your filter as recommended by the filter manufacturer?

- 1 Always (Yes)
- 2 Sometimes
- 3 Never (No)

- 777 Don't know/Not sure
- 999 Refused

C. Do you use treated well water for drinking?

- 1 Yes
- 2 No
- 777 Don't know/not sure
- 999 Refused

D. Do you use treated well water for cooking?

- 1 Yes
- 2 Sometimes
- 3 No
- 777 Don't know/not sure
- 999 Refused

1b. Do you **currently** use untreated well water?

(for example: the well water does not go through a carbon filter such as Brita or Culligan filter, water softener, or reverse osmosis process)

- 1 Yes
- 2 No
- 777 Don't know/not sure
- 999 Refused

If **"Yes"**:

A. Do you use untreated well water for drinking?

- 1 Yes
- 2 No
- 777 Don't know/not sure
- 999 Refused

B. Do you use untreated well water for cooking?

- 1 Always (Yes)
- 2 Sometimes
- 3 Never (No)
- 777 Don't know/not sure
- 999 Refused

C. Do you use untreated well water for gardening, irrigation, landscaping?

- 1 Yes
- 2 No
- 777 Don't know/not sure
- 999 Refused

2. On average, how many 8 oz. portions (glasses) of **tap water** do you drink each day at home? Please include all water used in preparing or mixing beverages (like coffee, tea, lemonade, protein shakes).

_____ (enter 0 [zero] if none)

- 777 Don't know/not sure
- 999 Refused

Now, I will ask you about the water you drink that does not come from home.

3. On average, how many 8 oz. portions (glasses) of **tap water** do you drink each day at work, school, or a restaurant?

_____ (enter 0 [zero] if none)

777 Don't know/not sure

999 Refused

4. On average, how many 8 oz. portions (glasses) of **bottled water or canned/bottled beverages** do you drink each day? Please include all water used in preparing or mixing beverages (like coffee, tea, lemonade, protein shakes).

_____ (enter 0 [zero] if none)

777 Don't know/not sure

999 Refused

Food History

Now, I'm going to ask you some questions about what you have eaten in the last few days.

5. In the past 3 days, have you eaten the following:

5a. Fish, including tuna? This does not include shellfish such as shrimp.

1 Yes

2 No

777 Don't know / not sure

999 Refused

5b. Fish caught out of nearby lakes, streams or rivers?

1 Yes

2 No

777 Don't know / not sure

999 Refused

5c. Seafood?(such as crabs, clams or shrimp)

1 Yes

2 No

777 Don't know / not sure

999 Refused

6. In the past 3 days, did you eat fresh fruits or vegetables grown at your home?

1 Yes

2 No

777 Don't know/Not sure

999 Refused

7. Do you wash fruits and vegetables before eating them?

- 1 Always (Yes)
- 2 Sometimes
- 3 Never (No)

- 777 Don't know/Not sure
- 999 Refused

8. Do you cook or store acidic foods (pickled foods, tomatoes, etc) in ceramic pots?

- 1 Yes
- 2 No

- 777 Don't know/Not sure
- 999 Refused

10a. (If "Yes" to Question 8) Where are the pots from?

List country if known _____

9. Do you currently eat or drink:

9a. Homeopathic, home, folk, or natural remedies?

- 1 Yes
- 2 No

- 777 Don't know/Not sure
- 999 Refused

9b. Herbal teas (such as Echinacea tea, Chamomile tea, Raspberry tea, etc)?

- 1 Yes
- 2 No

- 777 Don't know/Not sure
- 999 Refused

9c. Vitamins or minerals or other dietary supplements (including protein shakes, herbal life, and muscles max)?

- 1 Yes
- 2 No

- 777 Don't know/Not sure
- 999 Refused

10. Do you currently apply homeopathic, home, folk, or natural remedies on your skin (such as creams, ointments, or poultices)?

- 1 Yes
- 2 No

- 777 Don't know/Not sure
- 999 Refused

Hobbies

Now, I will ask you about some of your hobbies.

11. Have you done any of the following activities in the past 30 days?

<u>Welding?</u>	1 Yes	2 No	777 Don't know	999 Refused
<u>Metal working?</u>	1 Yes	2 No	777 Don't know	999 Refused
<u>Jewelry making?</u>	1 Yes	2 No	777 Don't know	999 Refused
<u>Ceramic painting?</u>	1 Yes	2 No	777 Don't know	999 Refused
<u>Electronics parts/repair?</u>	1 Yes	2 No	777 Don't know	999 Refused

11a. Any other hobbies where you might come into contact with metals? List them:

Use of Tobacco

The next few questions are about tobacco use.

12) Have you ever smoked at least 100 cigarettes in your entire life?

- 1 Yes
- 2 No
- 777 Don't know/not sure.
- 999 Refused

13) Do you now smoke cigarettes every day, some days or not at all? [Read all options until selection is made.]

- 1 Every day
- 2 Some days
- 3 Not at all
- 4 I have never smoked or I used to smoke and quit more than one year ago
- 777 Don't know/Not sure
- 999 Refused

14) Have you ever used tobacco products (SNUS, ORBS, Snuff, chewing tobacco, hookah, E-Cigs) in your entire life?

- 1 Yes
- 2 No
- 777 Don't know/not sure
- 999 Refused

15) Do you currently use any tobacco product every day, some days or not at all? [Read all options until selection is made.]

- 1 Every day
- 2 Some days
- 3 Not at all
- 4 I have never smoked or I used to smoke and quit more than one year ago

777 Don't Know/Not sure

999 Refused

16. How many silver amalgam dental fillings do you have?

_____ (enter 0 [zero] if none)

777 Don't know / not sure

999 Refused

PERSONAL INFORMATION

The last few questions are about you.

17. Gender [Don't ask the person what sex he or she is, simply mark the appropriate number based on your observation and proceed to Question 23.]

1 Male

2 Female

777 Don't know/Not sure

18. How tall are you?

___ ___ Circle if measurement in: inches ft/in centimeters m/cm

(If the participant does not know his/her height, or if they refuse, estimate and indicate so on this form by marking "e" next to the figures you record.)

19. How much do you weigh?

_____ (lbs)

(If the participant does not know his/her weight, or if they refuse, estimate and indicate so on this form by marking "e" next to the figures you record.)

20. What is your date of birth?

___/___/___ (Month, Day, Year) estimated age: _____ years

(If the participant does not know his/her date of birth, or if they refuse, estimate their age and record it.)

21. How long have you lived in your current home?

___ (Years) OR ___ (Months, if less than one year)

777 Don't know/Not sure

999 Refused

22. Are you of Hispanic, Latino, or Spanish origin?

1 No, not of Hispanic, Latino or Spanish Origin

2 Yes, Hispanic, Latino or Spanish Origin

3 Yes, Mexican, Mexican American or Chicano

4 Yes, Puerto Rican

5 Yes Cuban

6 Yes, other Hispanic, Latino or Spanish origin_(fill in _____)

777 Don't know/Not sure

999 Refused

23. Which one or more of the following would you say is your race? (Check all that apply; please read)

1 White

2 Black or African American

3 Asian

4 Native Hawaiian or Other Pacific Islander

5 American Indian, Alaska Native

6 Other_[specify] _____

Do not read

777 Don't know/Not sure

999 Refused

If more than one response to Q23, continue. Otherwise, go to Q25.

24. Which one of these groups would you say best represents your race?

1 White

2 Black or African American

3 Asian

4 Native Hawaiian or Other Pacific Islander

5 American Indian, Alaska Native

6 Other_[specify] _____

777 Don't know/Not sure

999 Refused

25. What is the highest grade or year of school you completed? (Read only if needed)

1 Less than 9th grade

2 9th to 12th grade, no diploma

3 High school graduate (includes equivalency)

4 Some college, no degree

5 Associate's degree

6 Bachelor's degree

7 Graduate or professional degree

777 Don't know/Not sure

999 Refused

THANK YOU VERY MUCH FOR YOUR TIME AND COOPERATION IN ANSWERING MY QUESTIONS! We sincerely appreciate your help.



State of Utah

GARY R HERBERT
Governor

Spencer J. Cox
Lieutenant Governor

Utah Department of Health

Joseph K. Miner, M.D., M.S.P.H., F.A.C.P.M.
Executive Director

Disease Control and Prevention

Jennifer G. Brown, JD, MS
Division Director

Bureau of Epidemiology

Cristie Chesler
Bureau Director

Dear Participant,

Thank you for participating in the Four Corners States Biomonitoring Well Water Study.

As you may recall, we are conducting a study to determine possible exposures to heavy metals from well water you drink. In order to do this, we tested water collected from your kitchen tap for the presence of specific metals: arsenic, cadmium, mercury, manganese, selenium, and uranium.

Enclosed you will find four documents:

- The laboratory test results for your water (Titled: Utah State Department of Health Division of Laboratory Services Environmental Chemistry Analysis Report)
- A table with reference values established by the United States Environmental Protection Agency (EPA) along with what was found in your water (Titled: Reference Values)
- A brief explanation of each of the chemicals tested (Titled: Fact Sheet)
- Resources for further assistance (Titled: Resources)

The water test report does not indicate any levels of concern for the metals we tested in your water. Please see attachment titled Reference Values for more information.

We are in the process of testing the urine you provided us. We are testing the urine for the presence of the metals listed above and phthalates as they metabolize in your body. We anticipate that urine tests will be complete within a few weeks. At that time we will send you a report with your results.

If you have further questions please contact Carrie Butler at 801-347-6739 or 801- 965-2400 or by email at cbutler@utah.gov.

Thank you again for your participation. It is only with your help and cooperation that we are able to gather and process new information in order to create a healthier environment.

Sincerely,

Sam LeFevre
Program Manager
Environmental Epidemiology Program





Reference Values

Exposure Assessment for Heavy Metals in Urine Four Corners States Biomonitoring Study

Study ID Number: BM49

Metal	Your Results ($\mu\text{g/L}$)**	95th Percentile*
Arsenic		50.4
Cadmium		0.907
Manganese		0.548
Mercury		1.75
Selenium		161
Uranium		0.029

* 95 percentile of National Health and Nutrition Examination Survey (NHANES). 95% of the people tested in the NHANES study had levels at or below this value.

** micrograms per liter



Resources

Please visit the Four Corner States Biomonitoring Consortium (4CSBC) at <http://www.4csbc.org/> to learn more about biomonitoring and the 4CSBC project. The website also includes general information regarding all chemicals of concern in the study. Please visit the 'Toolkit' section for a listing of resources specific to well water safety.

If you are concerned about high levels found in either your body or well water, please contact your local health department for information about retesting. Listing of local health departments can be found at <http://health.utah.gov/epi/community/sanitation/enviroHealth/>

If you have further questions about high levels found in your body, please contact your physician and be prepared to bring your test results to your appointment.

Please contact the Utah Health Department at (801) 538-6191 or the Poison Control Center at (800) 222-1222 for all other questions and/or concerns.

Please visit the following pages for more information about well water:

How to Protect your Well Water

<http://extension.usu.edu/files/publications/factsheet/WQFA-1.pdf>

Well Testing

<http://www.cdc.gov/healthywater/drinking/private/wells/testing.html>

Well Water Contaminant Reduction Claims Guide

<http://www.nsf.org/consumer-resources/what-is-nsf-certification/water-filters-treatment-certification/contaminant-reduction-claims-guide>



Reference Values

Exposure Assessment for Heavy Metals in Drinking Water in the Four Corners States Biomonitoring Study

Study ID Number: W490

Contaminant	Your Water Ug/L	EPA MCL Ug/L
Arsenic		10 MCL
Cadmium		5 MCL
Managanese		50 (ss)
Mercury		2 MCL
Selenium		50 MCL
Uranium		30 MCL

< *Lowest concentration that can be measured*

QNS quantity not sufficient

* 95 percentile of National Health and Nutrition Examination Survey (NHANES). 95% of the people tested in this study were at this number or below

** **MCL (Maximum Contaminant Level)** - *The highest level of a contaminant that is allowed in drinking water. MCLs are enforceable standards.*

(ss) Secondary Standards are non-enforceable and are not health based. The problems from these chemicals are either from cosmetic (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color).

ug/L is the same as parts per billion (ppb)

Fact Sheet

Arsenic is an element that occurs naturally in rocks and soil and is used for a variety of purposes within industry and agriculture. It is also a byproduct of copper smelting, mining, and coal burning. Arsenic can combine with other elements to make chemicals used to preserve wood and to kill insects on cotton and other agricultural crops.

Possible Health Concerns from Exposure:

Long-term exposure to high levels of inorganic arsenic may cause urinary bladder, lung, and skin cancers. It may lead to other health problems in some people, such as:

- Peripheral vascular disease
- Peripheral nerves changes
- Liver injury, which may progress to cirrhosis
- Skin changes, including pigmentation and hard patches on the palms and soles of the feet, which may lead to skin cancer

Actions to Lower Exposure:

- Have your well water tested; if levels are high consider using a treatment/filtration system
- Maintain a balanced diet
- Do not burn pressure-treated wood manufactured before 2004
- Wash your children's hands after playing on or around wooden play structures or decks
- If your deck was built before 2004 apply a protective sealing or coating
- If you work with arsenic, take all precautions to avoid bringing arsenic dust home

Cadmium is a naturally occurring element in the earth's crust. Low levels are in all soils and rocks. Cadmium can also be released into the environment from industrial activities, including: mining, smelting, and refining of non-ferrous metals (such as zinc, copper, and lead); combustion of fossil fuels; and incineration of municipal waste (especially batteries and plastics). Releases from these sources can travel long distances to deposit on areas far from the emission sources. Cadmium in soil and water can be taken up by some crops and aquatic organisms and accumulate in the food-chain. Food is the primary source of cadmium environmental exposure for the general population. Smoking tobacco is another important source of human environmental exposure. Inhaled cadmium is much more toxic to humans than when it is ingested. Cadmium exposure from drinking water is a less important exposure source than diet, but impurities in the zinc of galvanized pipes and solders in fittings, water heaters, water coolers, and taps can sometimes contaminate drinking water.

Possible Health Concerns from Exposure:

Long-term exposure to even low-levels of cadmium in food or drinking water may:

- Affect the way kidneys function
- Be associated with kidney and prostate cancer
- Lead to disturbances in calcium metabolism and formation of kidney stones, softening of the bones and osteoporosis (increased bone loss)
- Cause abnormal behavior and/or decreased intelligence
- Pulmonary disease and lung cancer

Actions to Lower Exposure:

- Do not allow children to play with batteries and dispose of them properly
- Quit smoking or avoid smoking around others
- Maintain a balanced diet
- If you work with cadmium, take all precautions not to bring cadmium dust home
- Always wash fruits and vegetables
- Have your well water tested; if levels are high, consider using a treatment/filtration system

Fact Sheet

Manganese is one of the most abundant naturally occurring metals in the Earth's crust and is normally found in rocks, soil, water, air, and many food sources. Manganese can also be released into the natural environment from industrial processes and products, such as the manufacturing of steel alloys or as a fuel additive/octane enhancer. Manganese is necessary for the proper function of many organ systems. The major source of intake by the general population is from food and manganese-containing nutritional supplements. Manganese exposure from drinking water can also be an important source of its intake and it is more easily absorbed from water than food. For the general population, inhalation exposure to manganese is of lesser concern except for areas close proximity to manganese industrial emissions, where it can be present in air in the form of dust particles and/or exposure to fumes from hobbies such as welding at home.

Possible Health Concerns from Exposure:

Inhaling high levels of manganese for a long period of time in a work setting can produce neurotoxicity, known as manganism. Symptoms include:

- Muscle weakness
- Tremors
- Lack of appetite
- Excessive weight loss
- Muscle pain
- Slow speech
- Difficulty walking/lower limb rigidity

Actions to Lower Exposure:

- Have your well water tested; if levels are high consider using a treatment/filtration system
- Maintain a balanced diet
- Use appropriate protective equipment if you work with metal or weld
- Keep children away from metal working/welding areas
- If you work with manganese, take all precautions not to bring manganese dust home

Mercury is a naturally occurring metal that exists in many forms. Forms of mercury can be organized into three groups: metallic mercury aka elemental mercury, inorganic mercury and organic mercury. Most of the mercury found in the environment is in the form of metallic mercury and inorganic mercury compounds. Metallic and inorganic mercury enters the air from mining deposits of ores that contain mercury, from the emissions of coal-fired power plants, from burning municipal and medical waste, from the production of cement, and from uncontrolled releases in factories that use mercury. People are also exposed to mercury by consumption of fish or shellfish contaminated with methylmercury, release of mercury from dental work and medical treatments, and practicing rituals that include mercury.

Possible Health Concerns from Exposure

Exposure to mercury is very dangerous. Exposure to all forms of mercury can cause:

- Permanent brain damage
- Kidney damage
- Harm to a developing fetus

Short-term exposure to mercury can cause:

- Lung damage
- Nausea, vomiting and diarrhea
- Increase blood pressure or heart rate.

Mercury exposure is particularly dangerous for

Actions to Lower Exposure

- Pregnant women should avoid areas where liquid mercury has been used and avoid eating fish that contain high levels of methylmercury, including swordfish, tilefish, king mackerel and shark
- Carefully handle and dispose of products that contain mercury, such as thermometers or fluorescent light bulbs
- Properly dispose of older medicines that contain mercury. Keep all mercury-containing medicines away from children.

Fact Sheet

children and the developing fetus.

Selenium is a naturally occurring, solid substance that is widely but unevenly distributed in the earth's crust. It is also commonly found in rocks and soil. Selenium, in its pure form of metallic gray to black crystals, is often referred to as elemental selenium or selenium dust. Elemental selenium is commercially produced, primarily as a by-product of copper refining. Selenium is not often found in the environment in its elemental form, but is usually combined with other substances. Much of the selenium in rocks is combined with sulfide minerals or with silver, copper, lead, and nickel minerals. Selenium and its compounds are used in some photographic devices, gun bluing (a liquid solution used to clean the metal parts of a gun), plastics, paints, anti-dandruff shampoos, vitamin and mineral supplements, fungicides, and certain types of glass. For example, selenium sulfide is used in anti-dandruff shampoos by the common trade name Selsun Blue. Selenium is also used to prepare drugs and as a nutritional feed supplement for poultry and livestock.

Possible Health Concerns from Exposures:

Because selenium is a naturally occurring trace element, it is nutritionally essential to maintain good health. Selenium, however, may be toxic at high concentrations and can cause adverse health effects. Exposure to high concentrations of selenium may cause:

- Nausea
- Vomiting
- Diarrhea
- Irritability
- Joint pain
- Loss of mental activity
- Skin rashes
- Respiratory complications

Actions to Lower Exposure:

- Have your well water tested; if levels are high consider using a treatment/filtration system
- Discourage children from eating dirt and make sure they wash their hands frequently
- Obey wildlife advisories issued by your state (game and fish may consume high levels of selenium in some areas)
- Do not exceed the recommended dosages when using dietary supplements and anti-dandruff shampoos

Uranium is a naturally and commonly occurring radioactive element. It is found in very small amounts in nature in the form of minerals but may be processed into a silver-colored metal. Rocks, soil, surface and underground water, air, plants, and animals all contain varying amounts of uranium. Because uranium is found everywhere in small amounts, people always take it into the body from the air, water, food, and soil. In most areas of the United States, low levels of uranium are found in the drinking water. Higher levels may be found in areas with elevated levels of naturally occurring uranium in rocks and soil.

Possible Health Concerns from Exposures:

Natural uranium and depleted uranium have the identical chemical effect on your body. Possible effects include:

- Kidney damage
- Lung damage
- Decreased fertility
- Skin irritation

Actions to Lower Exposure

- Avoid eating root vegetables grown in soils with high levels of uranium. Consider washing fruits and vegetables grown in that soil and discard the outside portion of root vegetables
- Consider having your water tested if you suspect that your drinking water might have elevated levels of uranium.