

ADHS Environmental Toxicology Program Past Activities in Dewey-Humboldt, AZ

Dewey-Humboldt, Arizona Town Council

February 20, 2024

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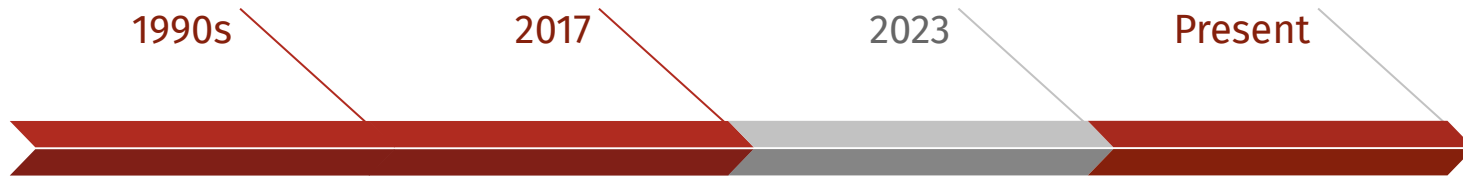
Objectives

- 01 Overview of ADHS Environmental Toxicology Program
- 02 Program History in Dewey-Humboldt, AZ
- 03 Health Consultation Overview
- 04 Past Health Consultations
- 05 Moving Forward



About the Environmental Toxicology Program

Funded by a cooperative agreement with the U.S. Department of Health and Human Services, Agency for Toxic Substances and Disease Registry (ATSDR).



Purpose: To respond to requests to evaluate potential environmental impacts on public health and provide technical guidance for site activities, while using the best science.

History of ADHS Involvement in Dewey-Humboldt

Between 2009 and 2017, ATSDR and ADHS investigated three ways that people might be exposed to harmful chemicals in the Dewey-Humboldt area.

- Breathing dust in outdoor **air**
- Drinking **water** from private groundwater wells or from the Humboldt Water System
- Swallowing **soil** or indoor dust accidentally

ADHS and ATSDR wrote **three** reports called **Health Consultations**.

Health Consultation Overview

What is a Health Consultation?

Use available environmental data to answer a specific question. Include:

- Identifying how people living in the area might be exposed to hazardous substances in the environment.
- Assessing exposures to chemicals and determining if the exposures could harm people.
- Making recommendations to agencies, stakeholders, and residents to protect the community's health.

Health Consultation Process

Gather Available Data

Once received, the toxicologist reviews and analyzes it.

Identify Chemicals of Concern

Determine contaminants that are a concern based on their concentration or community concern.

Evaluate Exposure Pathways

Who is exposed?
How were they exposed?

Evaluate Level of Exposure

What amount of chemicals can get into one's body by eating, drinking, or breathing?
How often were they exposed?
How long were they exposed?

Make a Health Conclusion

The conclusion will be either:
Hazard
No Hazard
Unknown

Finalize and Distribute Report

Includes recommendations and public health actions to help reduce exposure.



ARIZONA DEPARTMENT OF HEALTH SERVICES

Health and Wellness for all Arizonans

Health Consultation 1

March 26, 2009

Soil and Groundwater

Health Consultation

IRON KING MINE & HUMBOLDT SMELTER
DEWEY-HUMBOLDT, YAVAPAI COUNTY, ARIZONA
EPA FACILITY ID: AZ0000309013

MARCH 26, 2009

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

2009 Health Consultation Background

Resident concerns regarding the tailings from the Iron King Mine and Humboldt Smelter and the bioavailability of arsenic (ability to absorb into the body)

Purpose: To evaluate the available water and soil sampling results to determine if the detected chemical concentrations in groundwater and soil at Iron King Mine and Humboldt Smelter site pose a public health hazard.

2009 Health Consultation Background

Groundwater Data:

# of wells	Sample Location	Data Year
11	Vicinity of the Ironite Facility	2004, 2005
21	Groundwater samples from January, February and May 2006.	2006

2009 Health Consultation Background

Soil Data:

# of Samples	Sample Location	Data Year
8	Chaparral Gulch	2002
17	Onsite Sampling Sites	2004
3	Humboldt Elementary School	2004
2	Private Residences	2004
17	Residences near the IKM (EPA Removal Assessment report)	2005
9	Residences near the Humboldt Smelter	2005

2009 Health Consultation Conclusions

	Public Health Hazard?		Health Evaluations
Groundwater	2 wells (high arsenic levels)	30 wells	Residents who use the affected well water from the two wells for drinking and/or cooking for a long time may experience negative health effects.
Soil	1 sample from residence nearby HS (high lead levels)	57 samples	<p>No other soil metal concentrations at other residences pose an apparent public health hazard.</p> <p>ADHS does not expect to see acute or chronic adverse effects among the exposed population.</p> <p>No significant increase in cancer would be expected among the exposed population.</p>

2009 Health Consultation Recommendations



Who? Owners of wells containing arsenic above the safety level.

What? Install a **treatment system** that effectively removes arsenic. Meanwhile, use an alternative water source, such as bottled water, for drinking and cooking.



Who? All private well owners.

What? **Test their well water** yearly for bacteria and nitrates, and at least once for primary metals, such as arsenic, copper, and lead, etc.



Who? Everyone.

What? Encourage children to **wash their hands** after playing outdoors, and supervise toddlers and other children who exhibit pica behavior (eat things other than food, such as dirt or grass).



Who? Parents who suspect pica behavior.

What? **Contact ADHS or their physician** to discuss whether there is a need for a blood lead test.



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OF HEALTH SERVICES

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Health Consultation 2

February 7, 2013

Ambient Air

Health Consultation

Evaluation of Ambient Air Sampling Results

IRON KING MINE & HUMBOLDT SMELTER

DEWEY-HUMBOLDT, YAVAPAI COUNTY, ARIZONA

EPA FACILITY ID: AZ0000309013

Prepared by
Arizona Department of Health Services

FEBRUARY 7, 2013

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Community Health Investigations
Atlanta, Georgia 30333



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2013 Health Consultation Background

Resident concerns about levels of heavy metals in ambient air during high wind events.

Purpose: Evaluate the EPA air sampling results to see if the airborne contaminants are at levels harmful to human health.

2013 Health Consultation Background

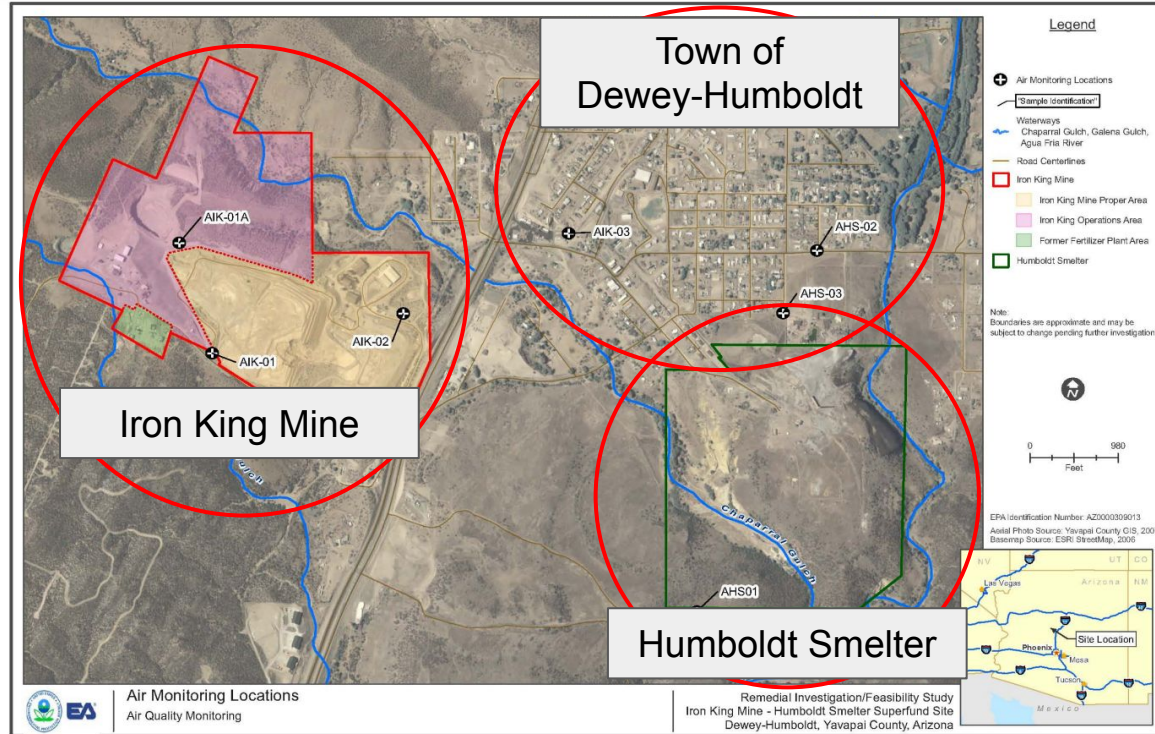
Data

Sampling stations were set up in three areas in addition to background collection.

Samples were analyzed for:

- Total suspended particulates (i.e. total amount of dust)
- Particulate matter 10 micrometers or less in diameter (PM10)
- 13 metals in dust

PM10 was used to estimate the concentration of PM2.5 to assess the long-term health effects due to exposure to fine particles.



2013 Health Consultation Conclusions

Study Area	Short-Term Exposure PM10 over a 24 hour period, possibly as short as an hour	Long-Term Exposure PM10 estimating PM2.5 concentration	Metals
Iron King Mine	No expected harm to human health	No expected harm to human health	No expected harm to human health
Humboldt Smelter	Public Health Risk during high wind events	No expected harm to human health	No expected harm to human health
Humboldt-In-Town	No expected harm to human health	No expected harm to human health	No expected harm to human health

2013 Health Consultation Recommendations for ADEQ



Who? ADEQ

What? **Sample for PM2.5** in future air sampling events.



Who? ADEQ

What? **Issue warnings** on days with hazardous air pollution and share with local media



Who? Residents

What? **Take proper precautions** based on the ADEQ air quality warnings.



Who? ADEQ

What? Develop/implement/enforce effective **air pollution/dust control measures**.



Who? ADEQ

What? Set up fences in the mine or smelter areas to **restrict public access**, and provide warning.



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Health Consultation 3

March 16, 2017

Water

Health Consultation

IRON KING MINE & HUMBOLDT SMELTER

An Update for Water Sampling Results

DEWEY-HUMBOLDT, YAVAPAI COUNTY, ARIZONA

CERCLIS ID: AZ0000309013

Prepared by

Arizona Department of Health Services
Office of Environmental Health
Environmental Health Consultation Services

March 16, 2017

2017 Health Consultation Background

Residents concerns about levels of heavy metals detected in the air, water, and soil and want to know how the detected contaminants could affect the health of the community members, especially children.

Purpose: This health consultation evaluated the health risks associated with exposure to contaminants in **groundwater** samples collected by EPA, and **public drinking water** samples collected by ADEQ. ADHS only evaluated wells that could potentially be used for drinking, cooking, or personal hygiene.

2017 Health Consultation Background

Data

EPA groundwater samples: (one sample was collected from each well location/household.)*

- Public drinking supply wells
- Private drinking water wells
- Monitoring wells
- Water near an old mine shaft
- Groundwater within the tailings
- An old drinking water well (no longer in use)

*ADHS conducted this evaluation assuming the concentrations detected would remain at these levels

ADEQ public drinking water samples:

Water samples collected directly from the water plant after they are processed and before they are sent to the customers.

Evaluated for:

- Arsenic
- Nitrate as Nitrogen

Exposure to ADEQ Public Drinking Water Samples:

	Health Concern	Why?
Past Exposure (Before 2015)	Adults	High levels of arsenic in 6/8 samples. There was an estimated 3 additional cancer cases in 10,000 exposed individuals.
	Children	
Current Exposure (After 2015)	Adults	Humboldt Public Water System (PWS) installed an arsenic treatment system and received the required approval in 2015. The water met the arsenic standard and the PWS was in compliance.
	Children	

Exposure to EPA Groundwater Samples:

Total Wells Tested: 53

	Adult Health Risk	Children Health Risk	Possible Health Concern(s)
Arsenic	Cancerous effects from 29 wells	Non-cancerous effects from 17 wells	Cancer & Non-Cancer (skin)
Bromide			Lung & Neurological Effects
Lead		2 wells	High Blood-Lead Level (>5µg/dL)
Magnesium		1 well (0-1 year old children)	Gastrointestinal discomfort
Manganese		1 well	Non-cancerous (CNS)
Nitrate as Nitrogen		2 wells	Methemoglobinemia (Blue Baby Syndrome)
Sulfate	2 wells	2 wells	Laxative Effects (Diarrhea)
Total Dissolved Solids			Kidney Stones, Heart Disease, Diabetes, etc.
Multiple Chemical Exposure			Additive Cancer Effects

2017 Health Consultation Recommendations



What? Install a **treatment system** that effectively removes arsenic for groundwater wells with arsenic above the safe level.



Who? Parents of children in Dewey-Humboldt

What? Contact their physician to discuss whether their child needs a blood lead test.



Who? Dewey-Humboldt residents

What? Attend public meetings and public education activities to obtain more information on ways to minimize the amount of exposure to the contaminants.

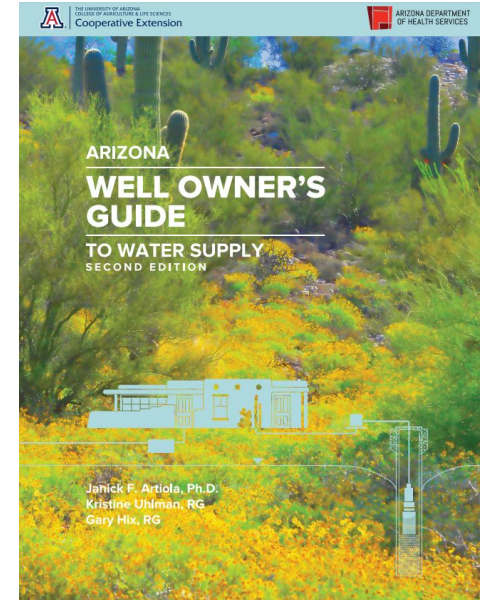
2017 Health Consultation Recommendations



Who? Well owners in Dewey-Humboldt

What? Test their well water. The recommended testing schedule is:

All New Wells	Once a Year	Every 5 Years
<ul style="list-style-type: none">• Arsenic• Bacteria (<i>total coliform</i>)• Fluoride• Lead• Nitrates• Total Dissolved Solids• Uranium	<ul style="list-style-type: none">• Bacteria (<i>total coliform</i>)• Nitrates	<ul style="list-style-type: none">• Arsenic• Copper• Fluoride• Lead• Radon• Uranium



Moving Forward

Resources Available to the Dewey-Humboldt Community

Environmental Health

Resources

- Environmental Exposure Reduction Education
 - Childhood Lead Poisoning Prevention Program
 - Well Water Quality Program
 - Info on Arsenic, Nitrates, Recommended Testing Schedule
 - Dust Exposure Reduction
- Environmental Health Data
 - Environmental Public Health Tracking Program
 - School and Child Care Center Lead in Drinking Water

Services

- Environmental Toxicology Program
 - Child Care Facility Safe Siting
 - Health Consultations
- Limited affordable private well water testing
- Public school and child care facility drinking water testing (lead only)
- School Gardening Program

Resources Available to the Dewey-Humboldt Community

Cancer Prevention and Screening

Prevention

Arizona Smokers Helpline (ASHLine) - 1-800-556-6222

- Assistance in quitting tobacco use.
- All Arizonans are eligible to utilize the telephone and web-based services - azdhs.gov/ashline.

Screening

Sliding Fee Scale Clinic Locations

- Discounted/sliding fees are based upon federal poverty guidelines, and patient eligibility is determined by annual income and family size. All Federally Qualified Health Centers (FQHCs), FQHC-Look-Alikes (FQHC-LALs), National Health Service Corp sites, Arizona Loan Repayment sites and J-1 visa waiver sites are required to apply the discounted/sliding fee-schedule.

State Partners

American Cancer Society - Finding cancer early, when it's small and hasn't spread, often allows for more treatment options. Some early cancers may have signs and symptoms that can be noticed, but that's not always the case.

American Lung Association - Whether you are in perfect health, or you are living with a lung condition, there are many things you can do to protect your lungs and maintain your overall health and well-being.

Mayo Clinic - The largest integrated, not-for-profit medical group practice in the world. [Mayo Clinic Appointment Site](#)

Thank you!!

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