Public Outreach Efforts and Results

ROCKY MOUNTAIN ARSENAL
MEDICAL MONITORING PROGRAM
What is the Rocky Mountain Arsenal?

- 27 square miles of farmland bought by US Army in 1942
  - Chemical weapons manufacture
  - Chemical weapons demilitarization
  - Hydrazine manufacture
- Manufacturing complex leased to Shell Oil Co in 1957 for pesticide manufacture
Rocky Mountain Arsenal
Rocky Mountain Arsenal
Arsenal Industrial History

- **USARMY:**
  - 1942-1969 Chemical Weapons Manufacture and Demilitarization
    - Mustard
    - Lewisite
    - Napalm
    - White Phosphorus
    - GB Sarin

- **Shell Oil Co (lessee):**
  - 1957-1982 Pesticide Manufacture
    - Aldrin
    - Dieldrin
    - Chlordane
    - Dibromochloropropane (Nemogon)
Environmental Issues

- Disposal Practices Caused Widespread Contamination to:
  - Surface soil
  - Surface water
  - Contaminated buildings
  - Lake sediments
  - Groundwater
Immediate Environmental Issues

- Widespread Bird Kills
- Contaminated Agricultural Wells Off-Site
- Crop damage off-post
- Citizen exposures and complaints about water quality
Arsenal “Hot Spot” Surface Contamination Areas

Figure 2.3. Manufacturing, storage, waste transit, and waste disposal sites at the Arsenal. Background image from 1982.
Arsenal Groundwater Contamination (1994 Assessment)

Figure 5.11. Estimated extent of the combined contaminant plume (Figure 5.10) and a combined DMIP and chloride plume in water year 1994, based on USGS (1997b).
Interim Response Actions

- During the 1980’s, the Army and Shell attempted triage of most contaminated areas before the ROD was negotiated.

- Basin F IRA was most problematic
  - Heavy airborne impacts to surrounding communities during winter months of 1988-1989
  - Caused concern among nearby citizens regarding safety of cleanup effort overall.
  - Became large-scale, visible political issue covered by media.
WHAT NOT TO DO
Medical Monitoring Program

- Basin F IRA caused deep concern about the safety of the Arsenal clean-up.

- ROD specified development of a medical monitoring program to monitor health issues in the surrounding communities in order to track potential health impacts from the cleanup effort.

- Medical Monitoring Program Advisory Group was comprised of citizen participants, state, local and federal representatives, PRPs and outside advisors.
Elements of Medical Monitoring Program

- Comprehensive Air Quality Monitoring
  - Air quality
  - Odor
  - Standards developed for Arsenal COCs
- Cancer Surveillance
- Birth Defects Surveillance
- Rocky Mountain Poison and Drug Hotline
- Newsletter (Health Matters)
Medical Monitoring Program Elements Continued

- Health Providers Education and Outreach
  - Notebooks, reference materials
- Youth Education/School Outreach
- Emergency Planning
  - Establishment of Health Response Review Board
- Medical Monitoring Planning involved Community Members
- Medical Monitoring relied on passive surveillance techniques and did not involve direct biomonitoring of surrounding community.
Rocky Mountain Arsenal Medical Monitoring Program Study Area
Public Outreach/Communication

- Once the program elements were identified and set in motion, a Citizen Advisory Board was formed
  - Quarterly meetings to transmit pertinent information regarding the Arsenal cleanup, such as air quality results and cancer and birth defect surveillance results
- Newsletter developed and mailed quarterly throughout the communities reiterating results of air quality monitoring and passive surveillance programs
- Interactive website developed to display air monitoring results
- A hot line for RMA-related health concerns was set up with dedicated staff to answer health-related concerns regarding the cleanup.
- CDPHE staff attended numerous community picnics and other local events
  - Booth and informational materials.
Website Demonstration

Rocky Mountain Arsenal Medical Monitoring Program Home Page
Rocky Mountain Arsenal Air Quality Data Reports
1,4-Dichlorobenzene at AQ5 between 1/1/1998 and 10/20/2010

10/20/2010

Data Last Updated: 12/8/2008 6:51:00 AM

Location Descriptions

(AQ5)

Air Quality Station AQ5 is located along the southern Arsenal fence line near the south entrance gate. This site monitors Denver metropolitan background impacts with southerly flow, and possible...
AIR QUALITY: THE RESULTS ARE IN

It's the job of the Colorado Department of Public Health and Environment to protect public health, and that job is taken very seriously. So, to ensure that the Rocky Mountain Arsenal cleanup process is safe, every single air quality measurement is checked. This way, the air quality around the Arsenal remains safe for all to breathe.

Many indicators are checked when air quality is monitored. Nine permanent monitoring stations on the Arsenal regularly test for more than 27 chemicals. Two more stations are in neighborhoods close by: one at Monbello High School and another at the Adams City Fire Station (see map for monitor locations, p.2). In 1999 alone, there were more than 25,000 tests conducted to monitor air quality.

THE RESULTS

How were the results? Reassuringly good. The results of the air monitoring on the Arsenal and the two sites in the communities show that no chemical exceeded the health protective levels in all of 1999 and through November, 2000. Odor measurements also were well below the state standard for both years. The two years of data show that air quality impacts due to the cleanup at the Arsenal are minimal (see charts, p. 3). But research doesn't stop here. Monitoring will continue and future results will be published in upcoming issues of this newsletter and on the website at www.cdphp.state.co.us/rma.

HOW IS YOUR SAFETY ASSURED?

After chemical levels are measured, the result of each air quality test is compared to safe limits. Each chemical measurement is scrutinized separately, and in addition, the safety of all the chemical measurements combined is also evaluated. Two types of protective air quality limits were developed to protect Arsenal neighbors and visitors. These two types of limits are called acute and chronic.

Acute means that health can be impacted if there is exposure to a lot of a chemical in a short time.

Chronic means that being exposed to a smaller amount of a chemical over a long time can also impact health.

Air quality is monitored with both acute and chronic exposure in mind to make sure that residents aren't exposed to a lot of chemicals in a short time, or to low levels of pollution over a long time. Either type of pollution might affect public health.

BUT WHAT HAPPENS IF SOMETHING GOES WRONG?

It's important to know that air tests are taken close to the cleanup projects in addition to the air quality stations along the Arsenal fence line. These close-in tests can help alert the state to a problem before it gets off site. Arsenal officials considered many possible scenarios and then made plans to correct those problems if they occur. There are many safeguards in place, including completely shutting down operations to ensure that public safety is protected.
Taking the Long Range Health Temperature

In the article about air quality on page 1, acute and chronic health effects were discussed. The graphs on page 3 show that the three chemicals of greatest concern were below acceptable acute levels—but what about chronic limits? And how about the health impacts of the 27 Arsenal chemicals of concern when they're combined?

The potential chronic health effects of each chemical are evaluated individually and again once they are added together.

The graphics below show the combined cancer risk from the 27 Arsenal chemicals of concern measured at the same air monitoring stations. The data show that the risk is well below acceptable limits for cancer health effects.

Air Quality at West Fence line Station
Cancer Risk 1999

0.000009
Maximum allowable level

0.0000001
Measured level

Air Quality at South Fence line Station
Cancer Risk 1999

0.000009
Maximum allowable level

0.0000004
Measured level

Monitoring Birth Defects at the Arsenal

The Rocky Mountain Arsenal Medical Monitoring Advisory Group recommended that birth defects be monitored in communities surrounding the Arsenal during the environmental cleanup. This recommendation was implemented by Colorado Respects to Children with Special Needs, the Colorado Department of Public Health and Environment's program for monitoring and preventing birth defects. This program began its work by determining baseline rates of birth defects in the communities before the environmental cleanup of the Arsenal began, and then by monitoring these rates until the cleanup is complete.

The results to date are good. Rates from 1989 through 1996 have been estimated and show no evidence of an elevated occurrence of birth defects in the communities when compared to statewide averages. Data are now being analyzed from 1997 forward to monitor the occurrence of birth defects as cleanup proceeds.

To do the job, information is gathered from a variety of sources, including hospitals, doctors and laboratories. Colorado law requires access to this information, but also requires that privacy is protected. Privacy and confidentiality are the highest priority within this program.

Since not all birth defects are diagnosed immediately at birth, information is reviewed on birth defects diagnosed up until a child's third birthday to enhance the completeness of surveillance.

In addition, children with birth defects born in the Arsenal surveillance study area (see map above) are automatically included in a program to help connect families with services and support in their local communities.

For more information, check the web site at http://www.cdpe.state.co.us/dep/crcrn/home.asp. The web site includes information on birth defects in general, fact sheets and a list of resources.

For more information call the Colorado Department of Public Health and Environment at (303) 697-2640.

One of the most exciting projects completed is the Rocky Mountain Arsenal Medical Monitoring Program website. You can find information at the site on everything from the history of the Arsenal to details on the chemicals that were manufactured there. Visit the site at www.cdpe.state.co.us/cmn.

We have a Web site!!
Bomblets at the Arsenal

On Monday, October 16th, 2000, a bomblet containing liquid Sarin, a toxic nerve agent manufactured at the Arsenal after World War II, was discovered in the central part of the Arsenal. Subsequent inspections unearthed a total of six bomblets. All six bomblets were tested and confirmed to contain Sarin.

On December 1, the state and the Army reached an agreement to dispose of the bomblets using a device called the Explosive Destruction System. It is a mobile, self-contained system built to both contain the blast and neutralize the Sarin. In addition, the Army agreed to erect a large containment system over the entire area, including the six bomblets. This large structure includes an additional vapor treatment system that adds an extra layer of safety. Air monitoring conducted during all six detonations confirmed that all Sarin vapor was contained within the vapor containment structure.

Inspection and cleanup of the immediate area will be conducted to ensure that all devices of this kind are uncovered and handled properly. If any additional bomblets are discovered, they will be detonated in the same Explosive Destruction System used to destroy the original six bomblets.

WHAT DO THE GRAPHS SAY?

The two graphs below show the worst air quality readings taken in 1999 and through November, 2000 at the Arsenal fence line near Montebello and Commerce City for the chemicals that are of the greatest concern at the Rocky Mountain Arsenal. The top red line shows the Colorado Department of Public Health and Environment and the EPA safety limits that protect public health.

As the graphs indicate, the chemical readings were so low that they hardly register. In other words, air quality impacts from the Arsenal are significantly below health protective standards. Dust, the only pollutant that shows on the graph, even at its worst levels, was only 40 percent of what is allowable, and most of the dust measured came from sources outside the Arsenal boundaries. Odor is not shown on the graphs because there was none detected at the fence line.
How Can I Get More Information?

For questions about your health and the Rocky Mountain Arsenal cleanup, call the Rocky Mountain Arsenal Health Line toll free 1-888-671-7848, 24 hours a day, seven days a week.

For questions about the Medical Monitoring Program, call: Colorado Department of Public Health and Environment
Laura Bishard (303) 692-3310
laura.bishard@state.co.us

For questions about odors, call: Tri-County Health Department Information and Odor Response Line (303) 286-8032

To talk with EPA about the Rocky Mountain Arsenal, call: U.S. Environmental Protection Agency Diane Sanelli (303) 312-7822
sanelli.diane@epa.gov

For information on the cleanup, call: Remediation Venture Office of Public Relations
Ruth Mechem (303) 289-0337 or visit www.pmra.army.mil/rma.html

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Meet Your Citizen Advisory Board Members

Roland Russell

“In the past, there often wasn’t an open exchange of information and the community wasn’t kept informed about activities on Arsenal grounds. We’ve worked hard to change that legacy, and I think we’ve made progress. I’m determined to answer the question ‘What if...?’ This way, we can ensure that the safety of our residents is protected. The Citizen Advisory Board has been instrumental in trying to get the tough questions answered. I must admit, that I find it a challenge being on this board.”

Roland Russell, Rocky Mountain Arsenal Citizen Advisory Board Member and Commerce City Resident

Lee Kaley

“It is my opinion that the Citizen Advisory Board is essential to the cleanup at the Rocky Mountain Arsenal, Commerce City, Henderson and Montbello, as bordering communities to this facility, must have the confidence that local governmental agencies are the gate watchers that will assure that the highest concerns for clean air, community health and the environment are the critical concerns.

“I feel honored to help ensure that the citizens of the local community are protected and have a voice in the cleanup activities at the Arsenal.”

Lee Kaley, Rocky Mountain Arsenal Citizen Advisory Board Member and Montbello resident

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Hazardous Materials and Waste Management Division
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

ECRWSS
Postal Patron

Recycled
Paper
Birth Defects Surveillance
Cancer Surveillance

- Cancer Surveillance yields complex results requiring careful communication to citizen laypeople.
  - CAB Meeting Updates
  - Citizen summary
  - Full report at [http://www.cdphe.state.co.us/rma/1005bdcompendium.pdf](http://www.cdphe.state.co.us/rma/1005bdcompendium.pdf)
  - Is ongoing and will be completed in 2013 after census data from 2010 is compiled and made available.
# RMA Health Line

## Health Line Calls, December 1998-December 2008

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<thead>
<tr>
<th>Category</th>
<th>Number of Calls</th>
<th>Percent</th>
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<tbody>
<tr>
<td>Total calls</td>
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<td></td>
</tr>
<tr>
<td>Recording only</td>
<td>1547</td>
<td>95</td>
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<tr>
<td>Staff contacts</td>
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<td>5</td>
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<tr>
<td>- Information</td>
<td>44</td>
<td></td>
</tr>
<tr>
<td>- Medical Concern</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>- Not RMA-related</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>
Results

- As time wore on
  - lack of ongoing visible or olfactory impacts from Arsenal Cleanup caused public concern to noticeably diminish over time
  - Vigorous outreach efforts outstripped public interest and probably helped allay concern about cleanup impacts
  - Sense of recourse and rigorous transparency may have helped allay citizen concern about cleanup impacts on community health
Results (continued)

- Lack of impacts and transparency of the process and results probably main factor
- CAB Meetings became less well attended over the life of the project
- Eventually CAB moved to decrease frequency of meetings
- Contaminated intrusive work was completed during Autumn of 2008
- Final meeting of CAB took place on May 4th, 2010, where it voted to disband as an entity.
Questions?