

# Health Consultation

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Evaluation of Air Contaminants in the Treasure Valley Area

Ada and Canyon Counties, Idaho

SEPTEMBER 30, 2006

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

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An ATSDR health consultation is a verbal or written response from ATSDR to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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## HEALTH CONSULTATION

Evaluation of Air Contaminants in the Treasure Valley Area

Ada and Canyon Counties, Idaho

Prepared by:

Idaho Department of Health and Welfare  
Division of Health  
Bureau of Community and Environmental Health  
Under Cooperative Agreement with the  
U.S. Department of Health and Human Services  
Agency for Toxic Substances and Disease Registry

## Summary

There are 188 hazardous air pollutants (HAPs) regulated under the Environmental Protection Agency's (EPA) Clean Air Act that have been associated with a wide variety of health effects, including cancer, neurological effects, reproductive effects, and developmental effects. These and other toxic air contaminants are emitted from multiple sources, such as factories, businesses, vehicles, and agriculture, and can result in potentially harmful levels of chemicals in the air.

The two counties of Ada and Canyon in southwestern Idaho make up the area known as the Treasure Valley. This area has a population of over 500,000 and is the largest population center in Idaho. Public awareness and concern about HAPs have increased recently and citizens, community groups, and local municipalities have expressed the need for more information on the levels of HAPs in the Treasure Valley.

According to EPA's 2004 Toxic Release Inventory, there are 23 facilities in Ada and Canyon counties that emit toxic substances into the air or water. Of those 23, there are 13 facilities that emit more than one pound per year of a toxic substance into the air. These 13 facilities emitted 922,761 pounds of toxic substances into the air either through fugitive escape or direct emission in 2004.

In order to understand the possible public health impacts of HAPs and address the concerns of the population, the Idaho Department of Environmental Quality (IDEQ) started monitoring ambient concentrations of HAPs at its Northwestern Nazarene University (NNU) monitoring site in Nampa, Idaho in 2003. The monitoring program was designed to characterize, prioritize, and address the impact of HAPs on the environment and public health. In 2004, IDEQ asked the Idaho Department of Health and Welfare's Bureau of Community and Environmental Health (BCEH) to analyze the monitoring results and prepare a report to characterize the levels and any possible public health effects from exposure to the contaminants.

To prepare this report, BCEH first obtained air quality data for the NNU site and compiled a list of the air contaminants that were found in the samples. Second, BCEH used health-based comparison values (CVs) to screen out those contaminants that are unlikely to cause adverse health effects. Finally, BCEH calculated the possible health risks of those contaminants that were above a health-based CV.

### Conclusions:

- The average and maximum levels of contaminants in the air were all below CVs for acute, intermediate and chronic non-cancerous health effects. Therefore, they are unlikely to cause adverse non-cancer health effects.
- The contaminants acetaldehyde, crotonaldehyde, formaldehyde, arsenic compounds, cadmium compounds, and chromium compounds were found to be above their respective CVs for cancer risk, with acetaldehyde and formaldehyde more than 40 times higher than their respective CVs. However, the cancer risk, based on a life time exposure for each of these chemicals, is considered to be low. Therefore, these levels represent no apparent public health hazard.

## **Purpose**

The Bureau of Community and Environmental Health (BCEH), Division of Health, Idaho Department of Health and Welfare (IDHW) has a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR) to conduct public health assessments and consultations for sites in Idaho. This health consultation was done as part of this cooperative agreement.

In 1996, the EPA conducted the National-Scale Air Toxics Assessment (NATA). The NATA produced results that are helpful in understanding the quality of air in the United States and its possible effect on people's health. The assessment looked at 33 air pollutants. These 33 pollutants are comprised of a subset of 32 air toxics from the Clean Air Act's list of 188 HAPs plus diesel particulate matter.

Specifically, the NATA consisted of 4 steps that produced nationwide estimates of:

- (1) the release of pollutants into the air from various sources;
- (2) the concentration of these pollutants in the air;
- (3) the exposure of populations; and
- (4) the risk of both cancer and non-cancer health effects resulting from this exposure.

Results specific to Idaho showed higher than average density values of volatile organic compounds and aldehydes in the Treasure Valley. In 2003, the Idaho Department of Environmental Quality (IDEQ) set up a monitoring program to better characterize the levels of specific pollutants in the Treasure Valley.

## **Background and Statement of Issue**

There are 188 HAPs regulated under the Clean Air Act that have been associated with a wide variety of health effects, including respiratory effects, cancer, neurological effects, reproductive effects, and developmental effects. These and other toxic air contaminants are emitted from multiple sources, such as factories, businesses, vehicles, and agriculture, and can result in potentially harmful levels of chemicals in the air.

The two counties of Ada and Canyon in southwestern Idaho make up the area known as the Treasure Valley (see Appendices A and B). This area has a population of over 500,000 and is the largest population center in Idaho. The area has experienced rapid growth over the past several years and continues to grow in population. Public awareness and concern of HAPs have increased recently and citizens, community groups, and local municipalities have expressed the need for more information on the levels of HAPs in the Treasure Valley.

According to EPA's 2004 Toxic Release Inventory, there are 23 facilities in Ada and Canyon Counties that emit toxic substances into the air or water. Out of those 23, there are 13 facilities that emit more than one pound per year of a toxic substance into the air. These 13 facilities emitted 922,761 pounds of toxic substances into the air either through fugitive escape or direct emission in 2004. Table 1 shows the substances released and the amount released into the air. It

should be noted that the EPA's Toxic Release Inventory is self-reported by industry and, therefore, has significant limitations on its validity. Also, the data in Table 1 does not include toxic substances released by non-point sources, such as automobiles and backyard burning.

**Table 1. Toxic Substances Released in Ada and Canyon Counties, Idaho, 2004**

<b>Substances Released</b>	<b>Pounds Released</b>
Ammonia	846,167
Styrene	33,627
Hydrochloric Acid	9,940
Chlorine	6,905
Hydrogen Fluoride	6,560
Toluene	4,726
Xylene (mixed isomers)	3,752
N-Hexane	2,581
Benzene	1,732
1,2,4-Trimethylbenzene	1,528
Nitric Compounds	1,398
Barium Compounds	1,327
Zinc Compounds	1,000
Ethylbenzene	729
Ethylene Glycol	265
Certain Glycol Ethers	255
Naphthalene	217
N-Methyl-2-Pyrrolidone	31
Lead Compounds	19
Mercury	.5

Source: EPA Toxic Release Inventory, 2004

In order to understand the possible impact of HAPs and address the concerns of the public, IDEQ started monitoring ambient concentrations of HAPs at its Northwestern Nazarene University (NNU) monitoring site in Nampa, Idaho in 2003. The monitoring program was designed to characterize, prioritize, and address the impact of HAPs on the environment and public health. In 2004, IDEQ asked BCEH to analyze the monitoring results and prepare a report on the levels and any possible health effects from exposure to the contaminants.

## **Discussion**

### **Assessment Methodology**

In order to evaluate public health issues related to air contamination in the Treasure Valley, BCEH followed a two-step methodology. First, BCEH obtained air quality data for the Treasure Valley site and compiled a list of the air contaminants that were found in the samples. Second, BCEH used health-based comparison values (CVs) to screen out those contaminants that are unlikely to cause adverse health effects. For the remaining contaminants that exceeded their

health-based CVs, BCEH made further determinations to evaluate whether the level of environmental contamination and exposure indicated a public health hazard.

Using CVs provides a way to screen and prioritize the contaminants at a site for further evaluation. CVs are derived separately for air, water, and soil. CVs reflect an estimated contaminant concentration level for which an exposure at or below that level is *not expected* to cause adverse health effects.

*CVs are not thresholds for adverse health effects.* That is, CVs do not represent a level at which a person exposed to a contaminant level above the CV will likely suffer health consequences. This is because typically CVs are set at levels many times lower than the levels at which health effects were observed in experimental animals or in human epidemiologic studies. CVs are also deemed protective because they include safety or protective factors that account for more sensitive populations, such as young children.

## **Environmental Contamination in the Ambient Air**

As part of IDEQ's Treasure Valley Hazardous Air Pollutants Study, between January 2003 and December 2004, IDEQ took air samples every several days at the monitoring station located at NNU. The chemicals monitored and analyzed in the air samples that have a CV are included in Appendix C. It should be noted that since the air monitoring data were collected at a single monitoring station, the results may not adequately represent contaminant levels at other locations in the Treasure Valley.

## **Contaminants of Concern**

In general, CVs are derived for substances for which adequate toxicity data exist for the exposure route of interest. CVs are generally available for three specified exposure periods: acute (14 days or less), intermediate (15 to 365 days), and chronic (more than 365 days). BCEH selects the exposure period (or periods) most appropriate for the conditions at or near the site for screening purposes.

In this report, concentrations of chemicals in the ambient air were compared to health-based air CVs to decide whether any of the chemicals needed further evaluation. For non-cancer toxicity, BCEH uses the EPA's reference concentration (RfC), ATSDR's environmental media evaluation guides (EMEGs), and the health-based National Ambient Air Quality Standards (NAAQS) for CVs. The RfC is the concentration of a chemical in air at which levels at or below this concentration are very unlikely to have adverse non-carcinogenic health effects if breathed continuously over a lifetime. Based on ATSDR's evaluation, EMEGs are estimated contaminant concentrations that are not expected to result in adverse non-carcinogenic health effects if air concentrations are at or below this concentration. NAAQS are established by the EPA and are set exposure limits to contaminants in air intended to protect public health, including the health of "sensitive" populations such as asthmatics, children, and the elderly.

For cancer risk, BCEH uses ATSDR's cancer risk evaluation guides (CREGs) and EPA's Region 9 cancer risk-based preliminary remediation goals (CA-PRGs). CREGs and CA-PRGs are

estimated contaminant concentrations that would be expected to cause no more than one excess cancer in a million ( $10^{-6}$ ) people exposed during their lifetime (70 years).

If the concentration of a chemical is less than its CV, it is unlikely that exposure would result in adverse health effects, and further evaluation of exposures to that chemical is not necessary. If the concentration of a chemical exceeds a CV, adverse health effects from exposure are not automatically expected, but potential exposures to that chemical from the site should be further evaluated.

## **Exposure Pathways**

To determine whether people are, were, or could be in the future exposed to the chemicals listed in Appendix C the environmental and human components that lead to exposure were evaluated. Exposure is said to exist if the five elements of an exposure pathway exist, have existed, or may exist in the future. An exposure pathway is composed of: 1) a source of contamination; 2) a movement of the contamination through air, water, and/or soil; 3) human activity where the contamination exists; 4) human contact with contaminant through breathing, swallowing and/or drinking; and, 5) a population that can potentially be exposed. If all five elements are present, an exposure pathway is said to exist.

Based on the exposure pathway analysis and environmental data, it was determined that residents of the Treasure Valley are exposed to the chemicals listed in Appendix C through breathing the ambient air.

## **Public Health Implications**

Average levels of contaminants in the air measured at NNU were all below CVs for acute, intermediate and chronic non-cancerous health effects. Also, the maximum levels of contaminants recorded were also below their CVs for acute and intermediate effects. Therefore, the contaminants measured are unlikely to cause any adverse non-cancer health effects. However, there were six contaminants that had average air concentrations above their cancer-related CVs.

The U.S. Department of Health and Human Services, the International Agency for Research on Cancer, and EPA have determined that all the contaminants of concern (acetaldehyde, crotonaldehyde, formaldehyde, arsenic compounds, cadmium compounds, and chromium compounds) are either possibly, probably or known to be carcinogenic to humans. Acetaldehyde, formaldehyde, arsenic compounds, cadmium compounds, and chromium compounds had annual average concentrations that were above the CREG CVs and the average annual concentration of crotonaldehyde (2-butenal) was above the CA-PRG (see Table 2). Since these contaminant levels are above the CREG or CA-PRG, BCEH further evaluated these contaminants.

**Table 2. Air Comparison Values and Contaminants Levels Found in the Air**

Contaminant	Number of Samples	Concentration in microgram per cubic meter ( $\mu\text{g}/\text{m}^3$ )			Comparison Value (CA-CV) in $\mu\text{g}/\text{m}^3$	CA-CV Source
		Minimum	Maximum	Average		
Acetaldehyde	121	0.64	5.52	2.05	.05	CREG
Crotonaldehyde (2-Butenal)	121	0.049	0.1	0.05	0.0035	CA-PRG
Formaldehyde	121	0.96	9.11	3.55	.08	CREG
Arsenic Compounds	238	0.0	0.0103	0.00065	.0002	CREG
Cadmium Compounds	238	0.0	0.0398	.00272	.0006	CREG
Chromium Compounds	237	0.0	0.0265	0.001	.00008	CREG

**Note:**

CA-CV for arsenic compounds-arsenic

CA-CV for cadmium compounds-cadmium

CA-CV for chromium compounds- chromium, hexavalent

CREG = cancer risk evaluation guide for  $1 \times 10^{-6}$  excess cancer risk.

CA-PRG = EPA Region 9 (Preliminary Remediation Goals for Cancer)

Since the CREG and CA-PRG are both based on a cancer risk of  $1 \times 10^{-6}$  (one in one million), BCEH used the following equation to estimate the cancer risk of the contaminants of concern in the ambient air.

$$Risk = \frac{Concentration}{CA-CV} \times 10^{-6}$$

Where,

Risk = estimated excess cancer risk over a lifetime (unitless)

Concentration = average concentration ( $\mu\text{g}/\text{m}^3$ ) in the ambient air

CA-CV = cancer risk based comparison values, such as CREG and CA-PRG ( $\mu\text{g}/\text{m}^3$ ), which are based on the cancer risk of  $1 \times 10^{-6}$

Based on the average concentrations of the contaminants of concern in ambient air, BCEH calculated the estimated cancer risk shown in Table 3.

**Table 3. Average Concentrations of Contaminants of Concern in the Ambient Air and the Estimated Cancer Risk**

<b>Contaminant</b>	<b>Average Concentration in microgram per cubic meter (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Comparison Value (CA-CV) in <math>\mu\text{g}/\text{m}^3</math></b>	<b>CA-CV Source</b>	<b>Estimated Cancer Risk</b>
<b>Acetaldehyde</b>	2.05	0.5	CREG	$4 \times 10^{-6}$
<b>Crotonaldehyde (2-Butenal)</b>	0.05	0.0035	CA-PRG	$9 \times 10^{-6}$
<b>Formaldehyde</b>	3.55	0.08	CREG	$5 \times 10^{-6}$
<b>Arsenic Compounds</b>	0.00065	0.0002	CREG	$2 \times 10^{-5}$
<b>Cadmium Compounds</b>	0.00272	0.0006	CREG	$2 \times 10^{-6}$
<b>Chromium Compounds</b>	0.001	0.00008	CREG	$5 \times 10^{-5}$

**Note:**

CV for arsenic compounds-arsenic

CV for cadmium compounds-cadmium

CV for chromium compounds- chromium, hexavalent

CA-PRG = preliminary remediation goal based on cancer risk of  $1 \times 10^{-6}$  (EPA Region 9).

CREG = cancer risk evaluation guide for  $1 \times 10^{-6}$  excess cancer risk.

It is important to note that cancer risk estimates do not provide definitive answers about whether or not a person will get cancer; rather, they are measures of chance (probability). Cancer is a common illness, with many different forms that result from a variety of causes; not all are fatal. According to the American Cancer Society, nearly half of all men and one-third of all women in the U.S. population will develop cancer at some point in their lives. Since cancer is very common and the highest risk estimate is 5 excess cancers per 100,000 people exposed over a lifetime (70 years), this estimated increase is not considered an apparent public health concern. Also, the contaminant with the highest cancer risk is chromium and the CV used for estimating cancer risk for chromium is set for hexavalent chromium, the most carcinogenic form of chromium. The air data used in this report does not establish the type of chromium compound in the air so it is expected that the actual amount of hexavalent chromium in the air is less than the amount reported as total chromium; therefore, it is likely that excess cancers from chromium is less than the estimate.

Since cancer is so common and cancer risk estimates are not definite, it is determined that the contaminants included in this report represent no apparent public health hazard (see Appendix D for hazard category definitions).

**ATSDR Child Health Concerns**

ATSDR and BCEH recognize that children may be more sensitive to chemical exposures than adults. This sensitivity is a result of several factors: 1) children may have greater exposures to environmental toxicants than adults because, pound for pound of body weight, children drink more water, eat more food, and breathe more air than adults; 2) children play outdoors close to the ground, increasing their exposure to toxicants in dust, soil, water, and air; 3) children have a tendency to put their hands in their mouths while playing, thereby exposing them to potentially

contaminated soil particles at higher rates than adults (also, some children ingest non-food items, such as soil, a behavior known as “pica”); 4) children are shorter than adults, meaning that they can breathe dust, soil, and any vapors close to the ground; and 5) children grow and develop rapidly; they can sustain permanent damage if toxic exposures occur during critical growth stages.

As discussed earlier, exposure to the measured chemicals in ambient air at NNU is unlikely to result in any adverse non-carcinogenic public health effects to children or adults. The main concern is an increased risk of cancer in the exposed population. Since cancer risk is based on a lifetime exposure, the risk is the same for both adults and children. The levels found are considered to represent a low increased risk of cancer and, therefore, represent no apparent public health hazard.

## **Conclusions**

The average levels and the maximum levels of contaminants are below their respective CVs for non-carcinogenic adverse health effects; therefore, they are not expected to cause non-cancer adverse health effects. The contaminants acetaldehyde, crotonaldehyde, formaldehyde, arsenic compounds, cadmium compounds, and chromium compounds were found to be above their respective CVs for cancer risk, with acetaldehyde and formaldehyde more than 40 times higher than their respective CVs. However, the cancer risk, based on a life time exposure for each of these chemicals, is considered to be low. Therefore, these levels represent no apparent public health hazard.

Ada and Canyon county levels of contaminants listed in EPA’s 2004 Toxic Release Inventory have very low concentrations as measured by the monitoring station in Nampa, Idaho. The proximity of the monitoring station to the sources of the contaminants has a bearing on the level of a contaminant since levels will decrease as they move away from the source. The finding that the levels of contaminants listed on the EPA Toxic Release Inventory for Ada and Canyon counties are either very low or not detectable is not surprising given that some specific release sources of concern are located far from the air monitoring station. Monitoring stations closer to those sites would better characterize the level of contaminants from those sites and provide a better understanding of the health risks for the populations living in communities near the sites where contaminants are released. In-depth air dispersion modeling would also contribute to the understanding of health risks throughout the valley.

BCEH found that contaminants that were above their corresponding cancer CVs do not appear to be from sources identified in EPA’s Toxic Release Inventory for air releases in Ada or Canyon counties. These six contaminants (acetaldehyde, crotonaldehyde, formaldehyde, arsenic compounds, cadmium compounds, and chromium compounds) are possibly produced by mobile sources, such as automobiles, and would not be monitored in the EPA Toxic Release Inventory. Other possible sources include non-regulated or illegal emissions from small industrial or agricultural operations. Determining the sources of these contaminants would be helpful in finding avenues to reduce their concentrations in the air of the Treasure Valley.

## **Recommendations**

BCEH recommends that IDEQ continue air monitoring in the Treasure Valley.

BCEH recommends that IDEQ explore possible air toxics dispersion models that could be used to better characterize the spatial-temporal distribution of compounds listed in the Toxic Release Inventory for the Treasure Valley.

BCEH recommends that BCEH work with IDEQ to address air pollution in the Treasure Valley through educational activities.

BCEH recommends that BCEH work with IDEQ to identify the sources of pollutants that are at levels higher than their CVs.

BCEH recommends that BCEH work with IDEQ to look more closely at particulate matter pollution and any possible health effects associated with particulate matter exposure.

## **Public Health Action Plan**

BCEH will continue to work with IDEQ to assess health effects from exposure to ambient air in the Treasure Valley.

BCEH will work with IDEQ to investigate the levels of particulate matter in the Treasure Valley airshed and determine if the levels represent a risk to public health.

## **References**

U.S. Census Bureau, 2005 Population Estimates

Environmental Protection Agency's Toxic Release Inventory - [www.epa.gov/tri/](http://www.epa.gov/tri/)

Idaho Department of Environmental Quality, Treasure Valley Air Toxics Monitoring Project, January – December 2003. Quality Assurance Plan. October 2002.

American Cancer Society 2004

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## Certification

This Health Consultation was prepared by the Idaho Bureau of Community and Environmental Health under a cooperative agreement with the federal Agency for Toxic Substances and Disease Registry (ATSDR). It was completed in accordance with approved methodologies and procedures existing at the time the health consultation was initiated. Editorial review was completed by the Cooperative Agreement partner.



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Technical Project Officer, CAT, SPAB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation and concurs with its findings.

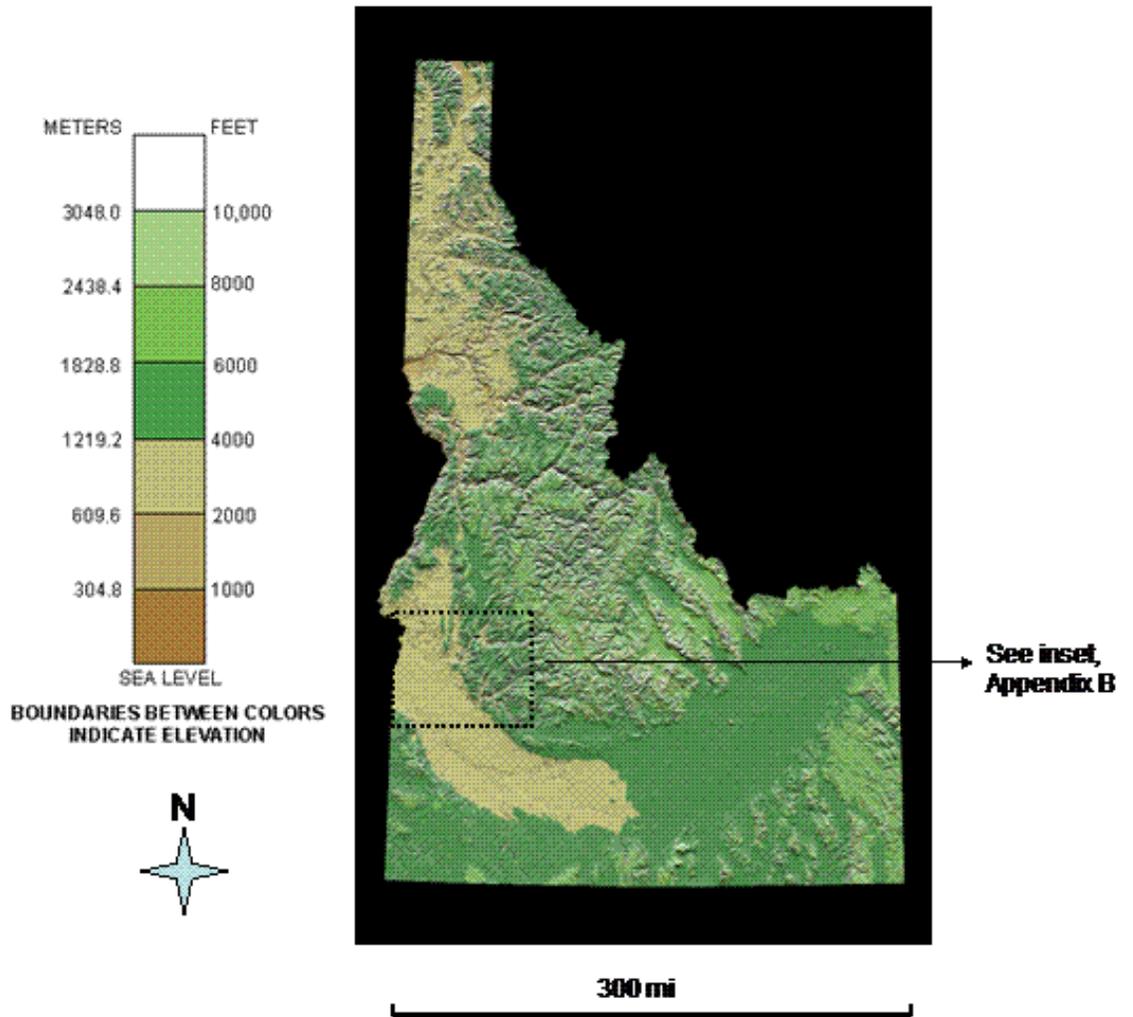


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Team Lead, CAT, SPAB, DHAC, ATSDR

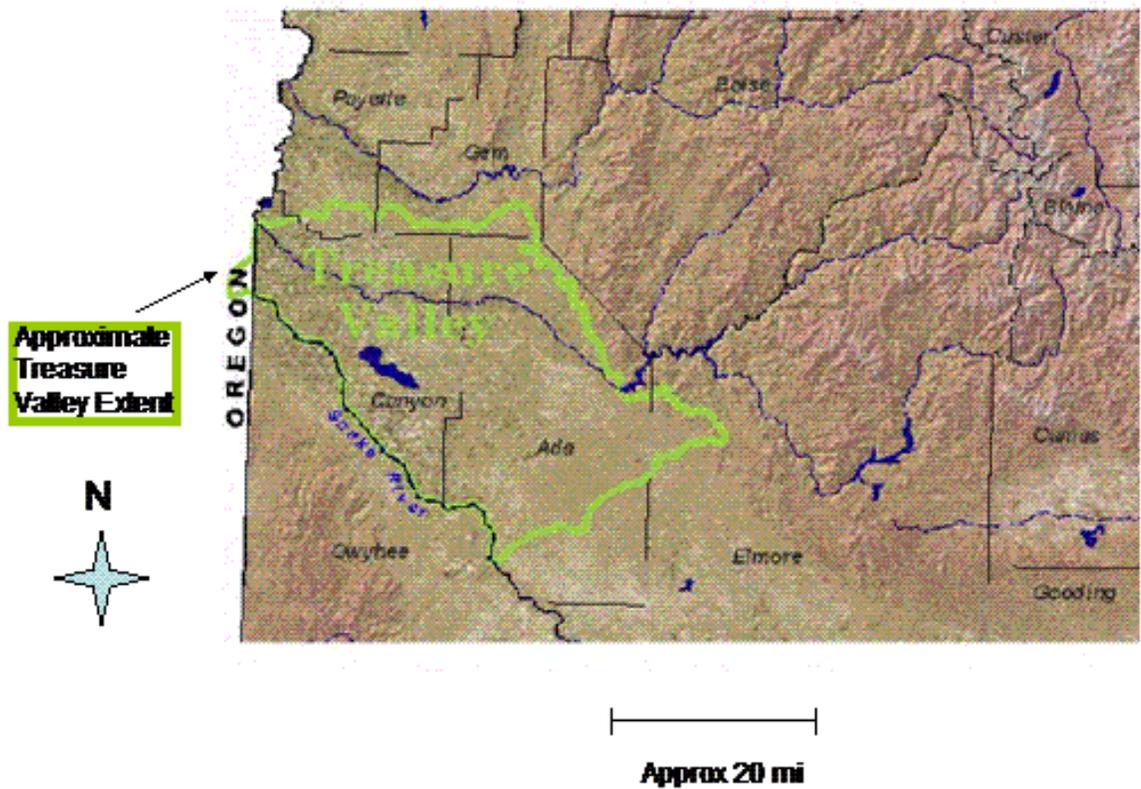
**Appendix A.**

**Digital Elevation Map (DEM) of Idaho**



DEM Source: USGS

**Appendix B.**  
**Map of The Treasure Valley, SW Idaho, Ada and Canyon Counties**



Base Map Source: Idaho State University

## Appendix C.

### Air Monitoring Results

		2003-2004 Average Concentration (ug/m <sup>3</sup> )	ATSDR CV – Chronic/MRL (ug/m <sup>3</sup> )	ATSDR – Acute (ug/m <sup>3</sup> )	ATSDR CREG (ug/m <sup>3</sup> )	RfC (ug/m <sup>3</sup> )	CA-PRG (ug/m <sup>3</sup> )	CANCER CLASS
<b>Ketones/aldehydes</b>								
	2-Butanone (MEK)	0.46582				5000		
	Acetaldehyde	2.04933			0.5	9	0.87	EPA B2, IARC 2B
	Acetone	2.60042	30000	60000			3300	
	Benzaldehyde	0.20157					370	3
	Crotonaldehyde (2- Butenal, (E))	0.05139					0.0035	
	Formaldehyde	3.54694	10	50	0.08		0.15	EPA B1, IARC 1
<b>Semi-volatile Organic Compounds</b>								
	Benzo[a]anthracene	0.00052					0.0092	EPA B2 IRAC 2A
	Benzo[a]pyrene	0.00040					0.00092	EPA B2 IRAC 2A
	Benzo[b]fluoranthene	0.00060					0.0092	
	Benzo[k]fluoranthene	0.00033					CAL modified .017	
	Chrysene	0.00043					CAL modified 0.17	EPA B2, IARC 3
	Dibenzo(a,h)anthracene	0.00034					0.00092	EPA B2 IARC 2A
	Indeno[1,2,3-cd]pyrene	0.00041					0.0092	
	Naphthalene	0.00118	4			3		EPA C IRAC 2B
<b>Volatile Organic Compounds</b>								
	1,1,1-Trichloroethane	0.00053		10000				EPA D IARC 3

		<b>2003-2004 Average Concentration (ug/m<sup>3</sup>)</b>	<b>ATSDR CV – Chronic/MRL (ug/m<sup>3</sup>)</b>	<b>ATSDR – Acute (ug/m<sup>3</sup>)</b>	<b>ATSDR CREG (ug/m<sup>3</sup>)</b>	<b>RfC (ug/m<sup>3</sup>)</b>	<b>CA-PRG (ug/m<sup>3</sup>)</b>	<b>CANCER CLASS</b>
	1,1,2,2-Tetrachloroethane	0.00066			0.02		0.0033	EPA C IARC E
	1,1,2,2- Tetrachloroethylene	0.00065	300	1000			0.32	IARC 2A
	1,1,2-Trichloroethane	0.00052					0.12	EPA C IARC 3
	1,1-Dichloroethane	0.00039					CAL modified 1.2	EPA C
	1,2,4-Trichlorobenzene	0.00071				200*		
	1,2-Dibromoethane (EDB)	0.00074			0.002	9	0.0034	EPA LIKELY IARC 2A
	1,2-Dichloroethane	0.00039	2000		0.04		0.074	B2, 2B
	1,2-Dichloropropane	0.00044		200		4	0.099	
	1,3-Butadiene	0.00021			0.03	2	CAL modified 0.011	IARC 2A
	Acrylonitrile	0.00021		200	0.01	2	0.028	EPA B1, IARC 2 B
	Benzene	0.00108	10	30	0.1	30	0.25	
	Bromoform	0.00100			0.9		1.7	EPA B2, IARC 3
	Carbon Disulfide	0.00031	900			700		
	Carbon Tetrachloride	0.00061	200		0.07		0.13	EPA B2 IARC 2B
	Chloroform	0.00047	100	500			0.083	EPA Likely IARC 2B
	cis-1,3-Dichloropropene	0.00061	9		0.3	20	0.48	EPA B2 IARC 2B
	Cyclohexane	0.00034				6000		EPA Inconclusive
	Ethyl Benzene	0.00057				1000		EPA D, IARC 2B
	Methylene Chloride	0.00048	1000	2000	3		4.1	EPA B2 IARC 2B
	Styrene	0.00041	300			1000		EPA C, IARC 2B
	Tetrahydrofuran	0.00029					0.99	

		<b>2003-2004 Average Concentration (ug/m<sup>3</sup>)</b>	<b>ATSDR CV – Chronic/MRL (ug/m<sup>3</sup>)</b>	<b>ATSDR – Acute (ug/m<sup>3</sup>)</b>	<b>ATSDR CREG (ug/m<sup>3</sup>)</b>	<b>RfC (ug/m<sup>3</sup>)</b>	<b>CA-PRG (ug/m<sup>3</sup>)</b>	<b>CANCER CLASS</b>
	Toluene	0.00314	300	4000		5000		EPA Inconclusive IARC 3
	Trichloroethylene	0.00051		10000		40	CAL modified 0.96	EPA B2, IARC 2A
	Vinyl Chloride	0.00024		1000	0.1	100	0.11	EPA A, IARC 1
<b>Compounds</b>								
	Arsenic Compounds	0.00065			0.0002			A, 1
	Cadmium Compounds	0.00272			0.0006			B1, 1
	Chromium Compounds	0.00108			0.00008	0.1		A, 1
	Lead Compounds	0.00201	1.5 (NNQS)					B2, 2A
	Manganese Compounds	0.00120	0.04			0.05		D
<p>*RfC for 1,2,4-trichlorobenzene is provisional</p> <p>CV for arsenic compounds-arsenic  CV for cadmium compounds-cadmium  CV for chromium compounds- chromium, hexavalent  CA-PRG = preliminary remediation goal based on cancer risk of 1x10<sup>-6</sup> (EPA Region 9).  CREG = cancer risk evaluation guide for 1x10<sup>-6</sup> excess cancer risk.  C-EMEG = chronic environmental media evaluation guide (ATSDR).  RfC = reference concentration (EPA).</p>								

**Appendix D.**

**ATSDR Interim Public Health Hazard Categories**

## Interim Public Health Hazard Categories

CATEGORY/DEFINITION	DATA SUFFICIENCY	CRITERIA
<p><b>Urgent Public Health Hazard</b></p> <p>This category is used for sites where short-term exposures (&lt;1year) to hazardous substances or conditions could result in adverse health effects that require rapid intervention.</p>	<p>This determination represents a professional judgment that is based on critical data, which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.</p>	<p>Evaluation of available relevant information* indicated that site-specific conditions or likely exposures have had, are having, or are likely to have in the future, an adverse effect on human health that requires immediate action or intervention. Such site-specific conditions or exposures may include the pre of serious physical or safety hazards.</p>
<p><b>Public Health Hazard</b></p> <p>This category is used for sites that pose a public health hazard due to the existence of long-term exposure (&gt;1year) to hazardous substance or conditions that could result in adverse health effects.</p>	<p>This determination represents a professional judgment that is based on critical data, which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.</p>	<p>Evaluation of available relevant information* suggests that, under site-specific conditions of exposure, long-term exposures to site-specific contaminants (including radionuclide) have had, are having, or are likely to have in the future, an adverse effect on human health that requires one of more public health interventions. Such site-specific exposures may include the presence of serious physical or safety hazards.</p>
<p><b>Indeterminate Public Health Hazard</b></p> <p>This category is used for sites in which “critical” data are insufficient with regard to extent of exposure and/or toxicological properties at estimated exposure levels.</p>	<p>This determination represents a professional judgment that critical data are missing and ATSDR has judged the data are insufficient to support a decision. This does not necessarily imply all data are incomplete; but that some additional data are required to support a decision.</p>	<p>The health assessor much determine, using professional judgment, the “criticality” of such data and the likelihood that the data can be obtained and will be obtained in a timely manner. Where some data are available, even limited data, the health assessor is encouraged to the extent possible to select other hazard categories and to support their decision with clear narrative that explains the limits of the data and the rationale for the decision.</p>
<p><b>No Apparent Public Health Hazard</b></p> <p>This category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past, and/or may occur in the future, but the exposure is not expected to cause any adverse health effects.</p>	<p>This determination represents a professional judgment that is based on critical data, which ATSDR considers sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.</p>	<p>Evaluation of available relevant information* indicates that, under site-specific conditions of exposure, exposures, exposure to site-specific contaminants in the past, present, or future are not likely to result in any adverse impact on human health.</p>
<p><b>No Public Health Hazard</b></p> <p>This category is used for sites that, because of the absence of exposure, do NOT pose a public health hazard.</p>	<p>Sufficient evidence indicates that no human exposures to contaminated media have occurred, none are now occurring, and none are likely to occur in the future.</p>	

- Such as environmental and demographic data; health outcome data; community health concerns information; toxicological, medical, and epidemiological data; monitoring and management plan